

RAIN GAUGE



Tipping Bucket Rain Gauge

Rain gauge is a device to measure liquid rain fall amount and intensity. The device is composed of a rain collector cone and a double-chamber tipping bucket connected to a magnet. In order to meet the requirement of information transmission, processing, recording and display, amount of rainfall is converted to pulse output by the magnet. It can be widely used in weather stations, hydrometric stations, agriculture & forestry, defence & field monitoring stations. It can provide the original data for flood prevention, water-supply system, and reservoir water management in plant.



Features

- Compact size for easy use.
- High accuracy, good stability.
- Mesh in the funnel preventing debris such as leaves and insects from entering the working of rain sensor (mesh is optional).
- Highly polished stainless steel construction.
- Rain collector with filter, to prevent the leaves, such as debris jam over the hole.
- Optional heating function in cold region.

Applications

Water supply systems, Hydrology, Natural disaster monitoring, Agro-meteorological research, Climate research, Weather stations etc.

Technical Specifications

	SS-TBRG-01	SS-TBRG-02	RK400-07	SS-TBRG-03
				
Diameter	φ200 mm	φ 200 mm	φ 200 mm	φ159.60±0.6 mm
Collector Area	314 cm ²	314 cm ²	314 cm ²	200 cm ²
Resolution	0.2 mm	0.1 mm & 0.2 mm	0.5 mm and 1 mm	0.1 mm
Accuracy	±4%	±4%	a) ±2% for rain rate up to 25 mm/hr b) ±3% or better, for rain rate between 25mm/hr to 150 mm/hr	±0.4mm(≤10mm); ±4%(> 10mm)

RAIN GAUGE



	SS-TBRG-01	SS-TBRG-02	RK400-07	SS-TBRG-03
Output	Dry reed switch contact pulses; RS485 (optional)	Dry reed switch contact pulses; RS485 (optional)	Dry reed switch contact pulses; RS485 (optional)	Dry reed switch contact pulses; RS485 (optional)
Operating temperature	0 to 60°C	-20 to +80°C (no freeze)	-20 to +80°C (no freeze)	0 to 60°C
Material	Rainfall collector & tipping bucket: ABS, supporting leg: 304SS	Collector: 304SS, tipping bucket: ABS	Collector: 304SS, tipping bucket: ABS	Housing: Aluminium Alloy
Weight	2.5 Kg	3.5 Kg	3 Kg	1.3 Kg

Common Technical Specifications

Rain Gauge	Principle	Switch close/open tipping bucket
	Design	WMO Complied
	Levelling unit	Bubble air fixed on the base
	Protection from dirtiness	Removable filter on the in-let
	Protection rate	IP66

Note: Calibration certificate from India Meteorological Department may be provided for specific requirement.



Environmental Monitoring Solutions

RAIN (Tipping bucket)


Rain gauge



- ▶ Design made in compliance to WMO
- ▶ Class A (UNI11452:2012) accuracy over intensity (see PN)
- ▶ Syphon to adjust the water flow (see PN)
- ▶ Alluminium made for rugged installations
- ▶ Heated versions availability (see PN)
- ▶ Impulse output and external optional devices for 4-20 mA

A Rain gauge is a device to measure liquid rain fall amount and intensity. The device is composed of a rain collector cone and a double-chamber tipping bucket connected to a magnet. The magnet operates one reed switch, which generates impulses that can be counted by external meters. Siphon: DQA230.1/231.1 versions are equipped with a siphon placed on the cone's nozzle; it has function during heavy rain, to regulate the flow into the bascule permitting all the water to fall inside the tipping bucket. This solution gives its best results where the main need is the measurement of the total amount of rain over long periods. Class A rain gauges: DQA230/231/235/236 versions have the "Class A" class accuracy as described by the UNI11452:2012 standard this class is the most accurate class for intensity measurement. For the Class A accuracy achievement, a correction formula on the data acquisition system is required.

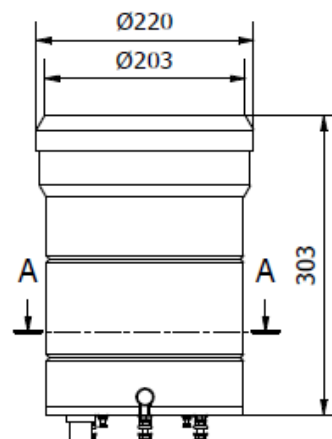
Technical Specifications

PN	DQA230	DQA231	DQA230.1	DQA231.1	DQA235	DQA236
						
Class A (UNI11452:2012)	YES	YES	NO	NO	YES	YES
Calibration certificate	Not included (requested for Class A achievement)		On request	On request	Not included (requested for Class A achievement)	
Diameter	203 mm.	203 mm.	203 mm.	203 mm.	360 mm.	360 mm.
Collector area	323 cmq	323 cmq	323 cmq	323 cmq	1000 cmq	1000 cmq

Order numb.	DQA230	DQA231	DQA230.1	DQA231.1	DQA235	DQA236
Heater	NO	YES 24 Vac (Max 60 W)	NO	YES 24 Vac (Max 60 W)	NO	YES 24 Vac (Max 50 W)
Heater operative temperature	-	>-20÷4°C	-	>-20÷4°C	-	>-40÷4°C
Siphone	NO	NO	YES	YES	NO	NO
Accuracy	0÷500 mm/hr intensity 3% UNI11452-2012 (using correction formula)		Accumulate rain fall amount 0÷20 mm/hr: ± 0,2 mm 20÷240 mm/hr: 1% >240 mm/hr: 2%		0÷300 mm/hr intensity 3% UNI11452-2012 (using correction formula)	
Protections	Capacitor debounce circuit				Polarity reverse and transient, Capacitor debounce circuit	
Operative temperature	0÷80°C	-20÷80°C	0÷80°C	-20÷80°C	0÷80°C	-40÷80°C
Cable	Not included (DWA5xx)					
Material	Housing: UV resistance aluminum Tipping spoon: teflonate plastic Base: plastic				Housing: Aluminum Tipping spoon: stain-less steel Base: PED	

Common Technical Specifications






Rain gauge	Principle	Switch close/open tipping bucket
	Design	WMO accordance
	Output	dry reed switch contact pulses (R<250Ω)
	Pulse duration	100 msec ± 50
	Output resistance	100 mΩ/ 1MΩ
	Resolution	0,2 mm
	Levelling unit	Bubble air fixed on the base
	Protection from dirtiness	Removable filter on the in-let
	Protection rate	IP66
	Data logger compatibility	M-Log (ELO008), E-Log, Alpha-Log, Pluvi-ONE



► Sensor's design has been made to meet the requirements of the WMO (Guide n.8).

► The LSI LASTEM's rain gauges has been developed taking the Class A standard as a reference. (UNI11452-2012 Hydrometry - Intensity of liquid precipitation on the ground - Metrological requirements and test methods for rain gauges). The Class A assures an accuracy over intensity of 3% within 0÷300 mm/hr range.

Accessories

	DYA039.1	Base plate for ground installation (DQA230-231-230.1-231.1)
	DYA040.2	Mast-mounting device for Ø 50 mm. pipe (DQA230-231-230.1-231.1)
	DYA040.3	Mast-mounting device for Ø 50 mm. pipe (DQA235-236)
	DYA058	Lateral support. Requires DYA040.2-.3
	DWA505	Cable L. = 5 m.
	DWA510	Cable L. = 10 m.
	DWA525	Cable L. = 25 m.
	MG2251	7 pin free female connector
	XLA003.1	Interface for 4-20 mA output. Input: pulse Output: 4÷20 mA (with auto-reset) Power supply: 10÷30Vdc (typ. 4mA@12 Vdc) Mounting: Din Rail Operative temperature: 40÷80°C
	XLA003.2	Interface for RS485 output. Input: pulse Output: RS485 (Modbus) Power supply: 10÷30Vdc (typ. 4mA@12 Vdc) Mounting: Din Rail Operative temperature: 40÷80°C



► LSI LASTEM laboratory is equipped with an automatic rain calibrator to check and calibrate the result of the measurements at different rain intensities according to the UNI11452-2012. Each rain gauge is calibrated using this equipment. Test Report is attached to each unit, calibration certificate is supplied upon request. LSI LASTEM can provide two kinds of calibration certificates: for total amount, or for Intensity (Class A), in this case the corrective formula is provided in the certificate.

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