Vaisala All Weather Precipitation Gauge VRG101

Features and benefits

- Reliable performance in all weather conditions
- Measurement of liquid, mixed and solid precipitation quantity and intensity with high-accuracy load cell technology
- Simple, robust and geometrically optimized mechanical design
- Enhanced performance, easy maintenance and extended service intervals for automatic precipitation monitoring
- Advanced measurement and heating control algorithms to ensure higher performance and low power consumption
- Equipped with configurable serial and pulse output data interface

Vaisala All Weather Precipitation Gauge VRG101 features technical innovations that provide higher quality of measurement combined with lower life-cycle costs in all weather conditions. Added with advanced mechanical design the VRG101 performance remains inaffect in the most adverse weather conditions known to be problematic for conventional rain gauges.

Accuracy in all weather

The VRG101 measurement principle is based upon the latest high-accuracy, temperature-compensated load cell technology. The single point type load cell is designed for direct mounting of the weighing platform. Eliminating levers and flexures, this allows simple, robust and low cost mechanics. The load cell is insensitive to eccentric loading meaning that unsymmetrical distribution of snow in the collecting bucket does not introduce measurement errors. Another error source, the underestimation caused by water and snow sticking on the inner surfaces of the gauge inlet funnel is solved in the VRG101 design using funnel element resting on top of the collector container. Therefore, all water and snow on its surface is included in the measured mass. A larger collection area and extended container volume and geometry enhance performance in light rain and snowfall.

Ease of maintenance

In the design special emphasis has been put on easy maintenance and extended service intervals. The hinged upper part and detachable enclosure door allow smooth access for maintenance or adding antifreeze agents, as well as easy removal of the collector container. The electronics unit, including the load cell is field-removable. Data loss is kept to a minimum, as there is no need to transport the whole gauge to the laboratory for a calibration. If needed, a field check can be done using calibration weights. A wide selection of optional features enhance performance and extends service intervals even more.

Algorithms and output options

The gauge software uses advanced algorithms to filter out noise, spurious signals (caused by e.g. vibration, wind, mechanical impacts or objects entering the collecting container), and to compensate evaporation. In addition to cumulative rainfall the gauge outputs also precipitation intensity, temperature, source voltage, gauge status and warning flags. Complete raw data (weight of the container) is also available for example for research purposes. The outputs include configurable RS-232 and RS-485 serial lines and a pulse output used for emulating a tipping bucket.

Technical data

General

Gauge type	Weighing precipitation gauge
Sensor element	Single point load cell
Precipitation types measured	Liquid, solid and mixed
Collecting area	400 cm²
Capacity	650 mm
Parameters measured	Cumulative precipitation (mm)
	Precipitation intensity (mm/h)
	Temperature (°C), optional

Interface

SERIAL I/O

RS-232 and RS-485 serial lines for gauge output and configuration.

Output modes	Polled or automatic message (min. 1 minute interval)
Output messages	Data and status message
Data message parameters	Gauge status
	Cumulative precipitation, mm
	Precipitation intensity, mm/h
	Air temperature, °C (optional)
	Container massa, g
	Electronics temperature, °C
	Supply power, V

PULSE OUTPUT

	Tipping bucked emulation
	Tip size software configurable, default 0.1 mm

TEMPERATURE SENSOR

	Pt100 interface

Performance

CUMULATIVE PRECIPITATION

Resolution	0.1 mm
Accuracy	0.2 mm
	precipitation event > 0.5 mm

PRECIPITATION INTENSITY

Range	0.5 ... 2000 mm/h
Resolution	0.1mm/h
Accuracy	±5 % up to 1200 mm/h
	±10 %, 1200 ... 2000 mm/h

Electrical

Supply voltage	+8 ... 31 VDC
Power consumption	< 30 mW (with Pt100)

Mechanical

Dimensions	Height 950 mm
	Diameter 400 mm
Weight	20.5 kg
Materials	Stainless steel, aluminium, high density polyethylene

Environmental

Temperature, operating	-40 °C ... +60 °C
Temperature, storage	-40 °C ... +60 °C
Relative humidity	0 ... 100 % RH

Heating option

Heating method	Rim heating
Heating control	Smart control algorithm to minimize evaporation error and power consumption
Heating power	100 W
Heating power supply	24 VAC/DC, 6A
max voltage	36V
max current	10A

Temperature sensor interface

Temperature sensor type	Pt100
Range	-40 ... +60 °C
Resolution	±0.1 °C
Measurement accuracy (electrical)	±0.1 °C
Sensor excitation	1.25 VDC, switched

Accessories

Rim heating	
Pedestal (optionally with screw pole foundation)	
Wind shields	Tretyakov wind shield
	Single Alter wind shield
	Double Alter wind shield
Pulse/Serial Output	Pulse output accessories
	Serial output accessories

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For more information, visit www.vaisala.com or contact us at sales@vaisala.com

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