

Laboratory Calibration of Tipping Bucket Rain Gauges

METEOROLOGY

General Description

HyQuest Solutions' TB340A is a **fully automated laboratory calibration and test bench** for a wide selection of tipping bucket rain gauges differing in type, make, shape and size. Thoughtful system design, quality hardware components and professional software development ensure the **reliability** and overall quality of the TB340A. The **autonomous** calibration bench is software controlled and thereby allows for **fast, well documented and repeatable testing**, and does not require particular user attendance.

Load-cell technology makes the system less vulnerable to ambient influences: Water is delivered by mass (635 g) rather than volume, resulting in **high accuracy and repeatability** between test runs.

Hardware

The TB340A is a laboratory device. Two tipping bucket rain gauges can be calibrated simultaneously. The height-adjustable platform accommodates different shapes and sizes of rain gauges, with or without the funnel assembly attached.

An external control software supervises the built-in controller (Modbus-RTU compliant) to run rain gauge functional tests and calibrations. For instance, the software can instruct the controller to activate one out of **five solenoid valves** (fitted as standard with 25, 50, 100, 200, 300 mm/hr intensity nozzles). This allows the operator to select from 31 different intensity combinations covering **a wide range of calibration standards**.

Software

The TB340A's Windows control software runs on standard PC hardware (see flip side). By means of **automating** the entire test runs and thus reducing user interaction, the control software **optimizes throughput**. Better yet, the software controls multiple TB340A **test benches daisy-chained** on a serial RS-485 link via Modbus-RTU protocol.

The software controls the functional test/calibration runs regulating water supply, collecting and analyzing data, comparing results against specs and generating a detailed report. A campaign can consist of a single or a series of test runs, for instance to calibrate the gauge at different rain rates. For each individual test, the software stores the tip counts as it progresses. It will then compare the test data to the specified performance of the tipping bucket rain gauge and finally generate a report on successful completion of a test.

Applications

The TB340A is especially suitable for

- Lab calibration of tipping bucket rain gauges
- Tipping bucket rain gauge intercomparison



Technical Specifications

Material

- Frame: aluminium
- Valves: brass
- Vessels: polycarbonate

Power

- Operating voltage: 110/240 VAC, 50/60 Hz to 0 V
- Fuse: Amp (5 × 20 mm, fast blow)

Performance

- Dispensed mass: 653 g
- Dispensed accuracy: ±0.3 % F.S. (±2 g)
- Load cell SWL: 3 kg
- Max. input water pressure: 100 psi
- Max. dispense rate: 1100 mm/hr (4 x 200 mm/hr, 1x300 mm/hr)

Communications

- Link: RS-485, 2-wire
- Protocol: Modbus-RTU

PC Requirements

- Operating system: Microsoft Windows Vista, 7, 8/8.1
- Memory: minimum 1 GB, recommended 2 GB
- Display: 1024 × 768 (minimum)

Environmental Conditions

- Operating temperature: -25 °C to 50 °C
- Humidity: 10 % to 90 %
- IP Rating: IP52

Dimensions (H x W x D) and Weight

- TB340A only: 1900 mm x 700 mm x 600 mm; 50 kg
- Packed in crate: 1840 mm x 900 mm x 700 mm; 135 kg

Related Products



Tipping Bucket Rain

Gauges (various models): HyQuest Solutions' tipping bucket rain gauges are used for measuring rainfall and

precipitation in urban and rural locations. With their 200 mm diameter catch and integrated syphon mechanism they deliver high levels of accuracy across a broad range of rainfall intensities. The tipping bucket rain gauges are robust, built for harsh environmental conditions and require hardly any maintenance. They are used worldwide in meteorology, climatology, hydrological and air quality monitoring stations, environmental monitoring, water treatment plants, dams, reservoirs, etc.



Portable Field Calibration Device (FCD):

The FCD effectively enables field technicians to run functional tests and calibrations of any given rain gauge in the field avoiding dismantling of TBRGs, reducing TBRG downtime and thereby saving time and money.



FCD-App:

The FCD-App is free software developed and supported by HyQuest Solutions. It provides the most accurate and comfortable way for collecting data when performing a field calibration of a tipping bucket rain gauge. The app operates on any Android platform (customer's own tablet or phone) with bluetooth technology. The app is used in combination with HyQuest Solutions' counter CMCbt.

Please ask for details.

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