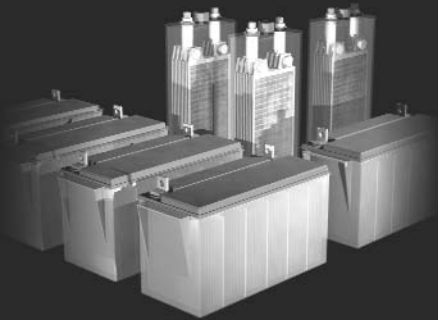


High Current Production Line Testing

Model VRX/VRL

Automotive &
Commercial Test
System



Discharge Tester for Automotive and Commercial Batteries



Discharge Capacity up to 1500 or 3000 Amperes



Low-Fatigue Design - Pneumatic Counterweight for Test Cables



Manual or Programmable Logic (PLC) Control



Bitrode

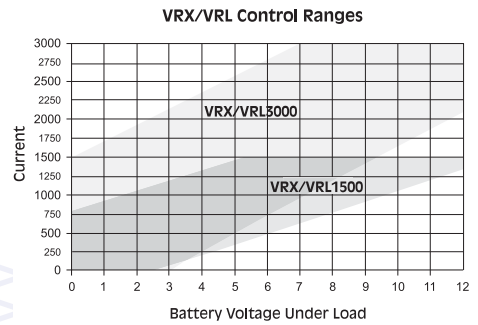
High Current Production Line Testing

Model VRX/VRL

Automotive & Commercial Test System

Automotive & Industrial Testing

The Bitrode VRX/VRL family of equipment is designed for high current production line discharge testing of automotive and industrial 6 and 12 volt batteries, allowing manufacturers to test for defects such as poor welds, reversed plates and poorly formed batteries. Programmable Logic Control (PLC) on the Model VRX offers users a way to develop, store, and access up to 100 different battery test profiles while the manually controlled Model VRL offers similar test performance with greater economy.



The PLC controlled Model VRX can perform open circuit voltage testing (OCV) for batteries up to 20V. OCV testing is available as an option on the manually controlled Model VRL.

What Does It Do and How?

The VRX/VRL is built with a variable resistive load. A phase controlled power supply in series with a solid state SCR switched load allows accurate, reproducible discharge current, regardless of the age or condition of the tester or cables. A battery under test can be reliably compared with a similar battery produced at another time or location. This testing reproducibility combines with accuracy of $\pm 1\%$ of full scale, providing reliable data for use in statistical process control.

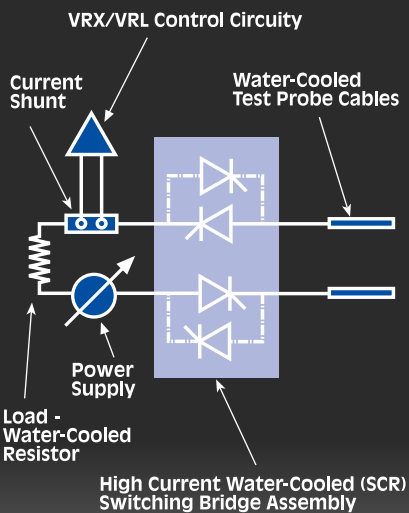
Models are available to discharge 6 or 12 volt batteries at a maximum current of 1500 or 3000 amperes with an accuracy of $\pm 1\%$ of full scale voltage and current. Single cell testing is also available.

Testing can be performed in either single or double step discharges from 0.1 to 9.9 seconds in duration, adjustable in 0.1 second increments.

Constructed for Efficient Use and Reliable Service

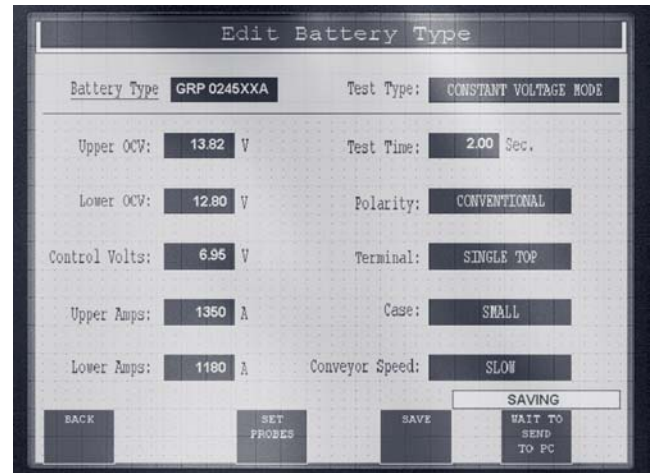
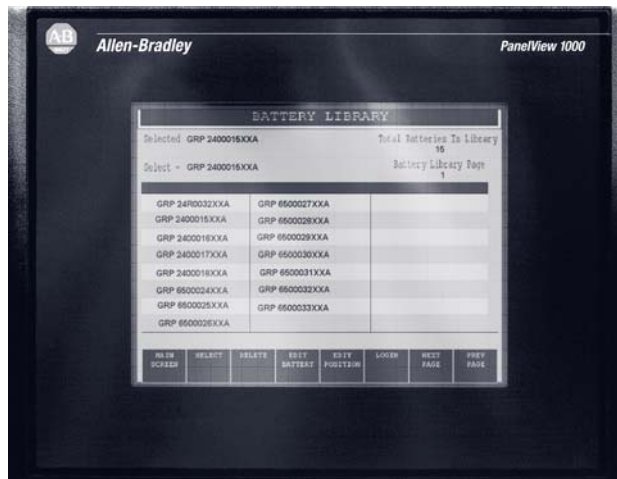
Pneumatically assisted test probes greatly reduce operator fatigue; the operator need only guide the cables up or down with gentle pressure between tests. When the discharge test is initiated, a high speed air valve releases the counter weight, allowing the weight of the cables to press on the battery for positive probe contact. After the test is completed, the air valve activates to lift the probes from the battery terminals.

Heat producing elements are water cooled for continuous service and long life. Water cooling is used in the test probes, discharge cables, load resistor, and the solid state load switching mechanism. Over temperature and low water pressure shutdown controls are standard safety features. Closed loop liquid cooling is available as an option.



Get In And Drive

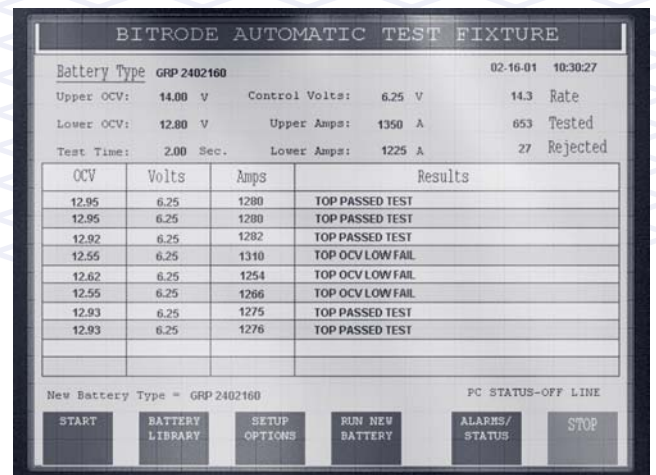
Standard Controls and Display



Above and Left: Battery type editing utility
Below: Screen displaying 10 most recent test results

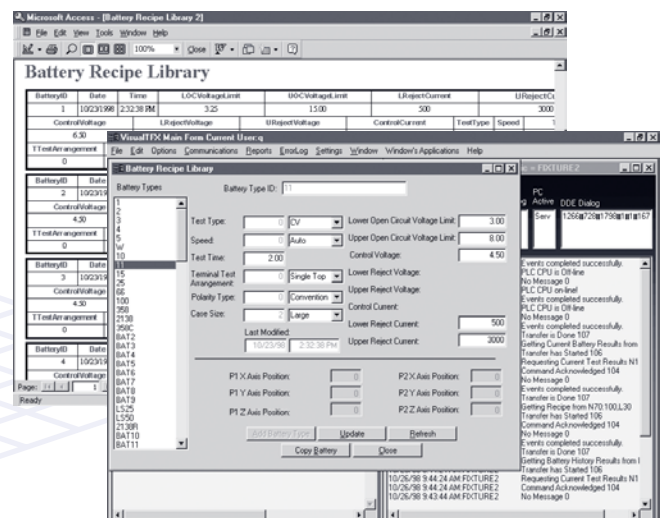
The standard control interface for the VRX is a touchscreen operator panel with a backlit LCD display. Using this, a VRX operator programs the battery test parameters for each battery type to be tested. Up to 100 battery test 'recipes' can be stored in the PLC memory. Test results from the most recently tested batteries are displayed on the LCD screen.

Manual control and monitoring are available on the Model VRL. Face-mounted controls allow the user to adjust test voltage, reduce current, and switch polarity. Digital and/or analog meters are available for test monitoring.



Expanded Capabilities and Data Acquisition

The VRX can optionally be connected to a host computer running Bitrode's Visual TFX software, developed for Windows Operating Systems. In this way, an unlimited number of battery recipes can be stored in the library and shared with other test units. Visual TFX software also enables customers to acquire data from one or more test units for later analysis and use across an entire company network, making information available to management, engineering, inventory, quality control, and sales departments. Data is stored in Microsoft Access format and can be viewed either in standard reports available through Visual TFX or can be reviewed in customer designed Access reports.



Software Screens from top: Battery Type Library Report;
VisualTFX Battery Type Editing Screen

Note the **Features:**

- ▶ Solid state Silicon Controlled Rectifier (SCR) load switching for superior reliability and repeatability
- ▶ Accuracy to within $\pm 1\%$ of full scale
- ▶ Units available to discharge at current from 0 up to 1500 or 3000 amperes with voltage control from 0 to 14 volts. Contact a Bitrode Representative for details
- ▶ Programmable Logic Control (PLC) interface for Model VRX - stores up to 100 battery test profiles locally, displays up to 10 test results
- ▶ Manual control and monitoring on the Model VRL
- ▶ Test duration programmable in 0.1 second increments from 0.1 to 9.9 second discharge
- ▶ Single or two step discharge testing
- ▶ Water cooling for heat generating components with automatic over temperature and low water level shutdown control

Beyond the Basics:

- ▶ Open circuit test and reject for up to 25 volts
- ▶ Connection to a Bitrode Model TFX automatic test fixture for unattended high current discharge testing
- ▶ Visual TFX software control and data acquisition
 - ▶ Shared storage for unlimited battery test programs
 - ▶ Test data acquisition and storage throughout the manufacturing process
- ▶ Current range for single cell testing
- ▶ Closed loop liquid cooling system
- ▶ Stainless steel construction

Minimum System Configuration for Visual TFX software:

Pentium Processor: 266MHz

RAM: 128 MB

Hard Disk: 3GB

Operating System: Windows XP, 2000, NT4.0

Specifications

Model	Input Power**				Dimensions		
	Volts	Hz	Phase	Amperes	W In/Cm	D In/Cm	H [†] In/Cm
VRL/VRX 1500	230/460	60	3	60/30	44/112	34/86	102/259
	220/380	50	3	60/37	44/112	34/86	102/259
VRL/VRX 3000	230/460	60	3	100/50	44/112	34/86	102/259
	220/380	50	3	100/61	44/112	34/86	102/259

Air Requirements: 60 psi minimum at 6 cfm

**Other Input Power Available

Water Requirements*: 40psi minimum at 6gal/min

*Not required if optional closed loop cooling system is used

†Height includes cable support mechanism



All products are subject to change in physical appearance and circuitry which will not alter performance specifications.

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