Industry Leading Battery Element Testers, Worldwide

Pulse Surge Arc Testing of Lead-Acid Batteries

Best-in-Class Performance, Safety, and Ease of Use

Discover why STS Instrument's battery element testers are selected by the leading battery manufacturers, worldwide. Our advanced testers are ideal for rigorous in-line high voltage production testing, providing quality, safety, and ease to use solutions.

Key Benefits:

- Superior accuracy ensures product quality & safety
- Unique short duration high voltage pulse method prevents excessive heat & potential UUT damage
- Short test times ideal for high-volume production
- Modern, user-friendly interface for ease of use
- Large, easy to read color LCD and audible alarm provides clear Pass/Fail indications
- Digital interfaces for data collection & process

Lead Acid Applications

Stationary Batteries

Aerospace

Grid-Scale, Off-Grid ESS

Automotive

Marine, Boats, Ships

UPS Battery

USB UNIVERSAL SERIAL BUS · RS232 · RS485 · PLC · LCD · CE

www.stsinstruments.com

1656 & 1657 Battery Element Testers

Test Smarter with Unique Fault Detection

The STS Instruments 1656 & 1657 Battery Element Tester provides a unique method for the detection of assembly level insulation defects in lead-acid batteries, including missing and damaged separators. Detection of such faults prior to filling and charging the battery reduces field failures and expensive recalls.

Short-Duration High Voltage Pulse Method Prevents Excess Heating

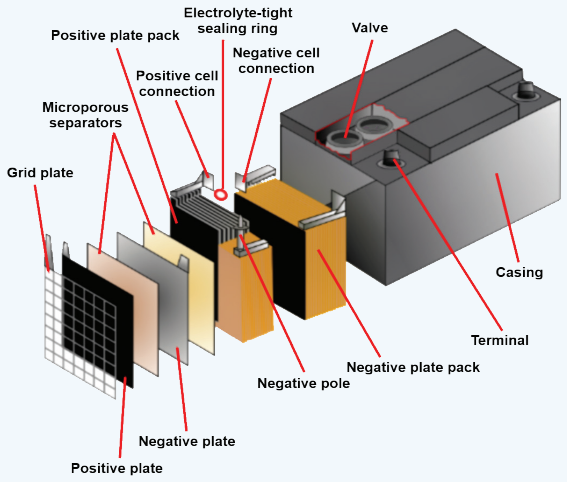
- Increase product quality and reliability by **rigorous in-line high voltage testing** of your battery element separator plates during production.
- Hidden imperfections in your separator plates are difficult to detect using traditional AC hi-pot testing to detect such failures. Excessive heating can occur in moist cell applications potentially damaging the unit under test.
- Unique short-duration high voltage pulse maximizes stress on the dielectric material for fault detection with minimal energy.

Advanced Technology Increases Accurate Fault Detection

Our advanced digital technology achieves superior levels of accuracy and fault detection compared to analog or other digital battery element testers.

- **Wide Operating Envelope:** Fully adjustable test voltage with a peak output capability of 3000V, accommodates wide range of separator spacings and type
- **Advanced Hardware Performance:** Durable solid state switching of high voltage output assures reliability for high volume applications.
- **User-Friendly:** Automated, easy-to-read readouts requires minimal training and setup.
- **Operator Error Prevention:** Operation is go/no-go, and requires no interpretation of results.
- **Increased Safety Protection:** The test voltage is applied using included safety probes. When a failure occurs, the high voltage is shut off and both audible and visual alarms warn the operator of any failure.

Typical Lead Acid Battery Anatomy



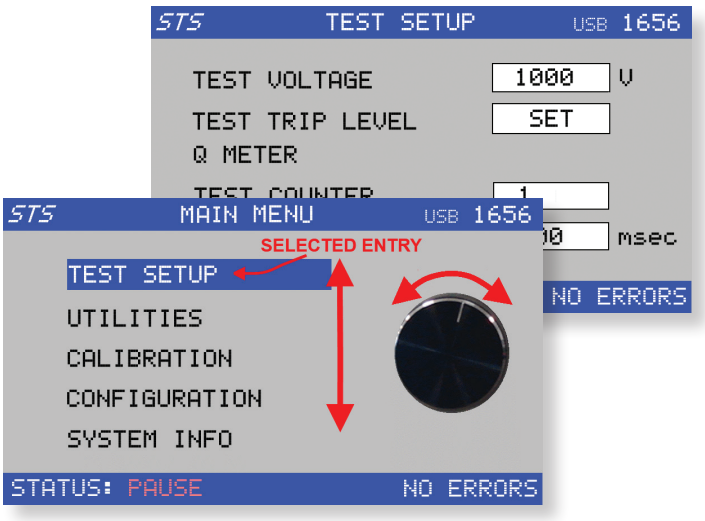
Fault detections in battery separator plates are difficult to detect using traditional AC hi-pot testing or legacy solutions.

Our battery element testers detect failures using advanced, high-tech methods and simplify testing.

Easy Operation Simplifies Test & Saves Time

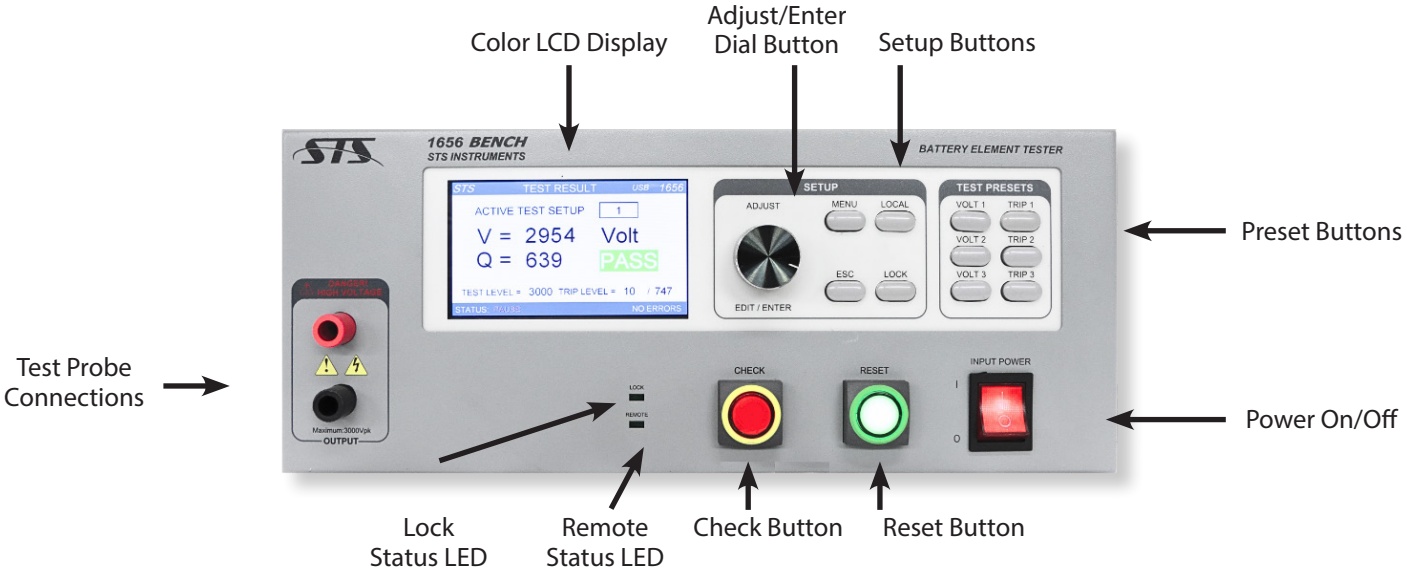
The Battery Element Testers use a large color LCD, a simple key pad, and on-screen menus to guide the operator.

- **Menu selection**: Press the MENU key and scroll through menu items with the rotary knob. Easily enter parameters with the knob as well.
- **Three TEST PRESETS**: Quickly recall using the VOLT and TRIP Hi/Lo Limit Keys.
- **High Voltage Test Probes**: Uses auto-retracting tips for operator safety. During test, an audible fail signal is generated if the test result is out of preset pass limits.
- **PLC Interface:** For automated test systems, use the PLC interface, USB, RS232 or RS485 interface.

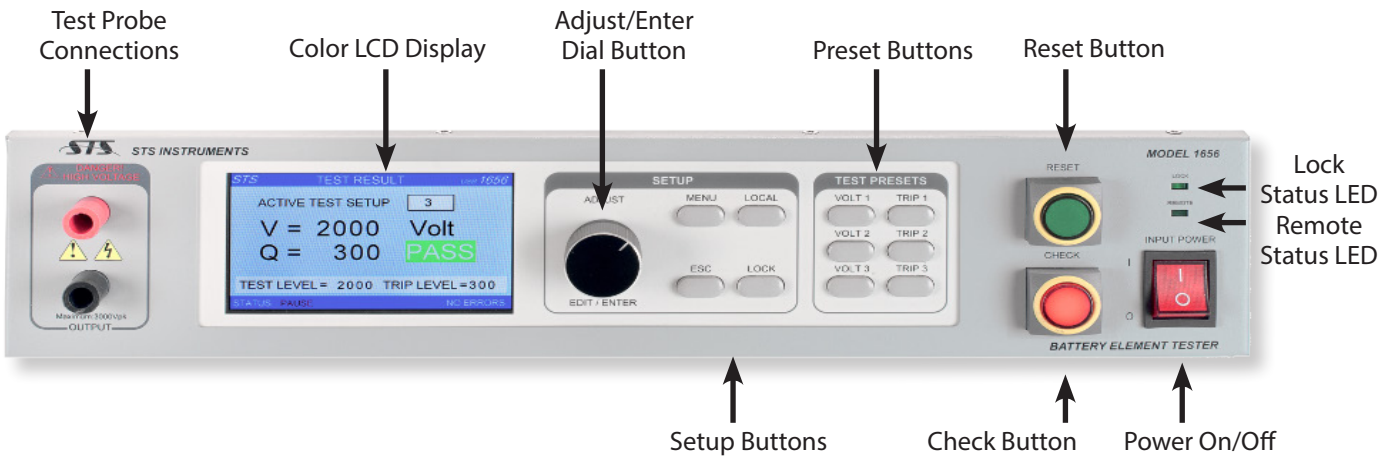


MENU Driven Front Panel Operation

Model 1657



Model 1656



Technical Specifications

OUTPUT VOLTAGE

RANGE	300 to 3000 Volts
RESOLUTION	10 V
ACCURACY	± 2.0%
SHAPE	Pulse
DURATION	120 µsec typ.
TEST INTERVAL	Programmable from 30 msec to 5000 msec

MEASUREMENTS (ALL DIGITAL)

VOLTAGE	Range: 0 to 3000 Volts Peak
	Resolution: 1 Volt
	Accuracy: ± 2.0% F.S.
QUALITY METER	Range: 10 to 3750
	Resolution: 1
	Accuracy: ± 2.0%

AC INPUT

INPUT VOLTAGE	100V to 240V ± 10 % Universal Input, 47 – 63 Hz
CURRENT	500 mA Max.
POWER FACTOR	0.98 Typical
FUSE	0.5A Slow Blow 250VAC.
	Fuse Dimension: 5 x 20 mm / 0.20" x 0.80"
LINE CORD	Detachable, IEC 60320, C13 Type (Line Cord Included)

ENVIRONMENTAL

TEMPERATURE (Operating)	0 to +40° C +32 to +104° F
TEMPERATURE (Storage)	-20 to +70° C -2 to +158° F
HUMIDITY	RH 5 to 95%, Non-Condensing
ALTITUDE	2000 m / 6000 ft.
POLLUTION DEG.	Cat II, Indoor Use

REMOTE CONTROL

USB (standard)	USB: 2.0, Type B Connector, Rear Panel
RS232 (option)[1]	DB9 Connector, Rear Panel
RS485 (option)[1]	DB9 Connector, Rear Panel
PLC I/O (option)	Digital I/O, D-Sub 15 pin connector, Rear Panel

REGULATORY

APPROVALS	CE Mark LVD 2006/95/EC
	Safety: IEC 61010-1:2010, Ed 3.0
	EMC: IEC 61326-1:2013, Ed. 2.0

Note 1: Options -232 and -485 are mutually exclusive. Only one of these can be specified on order.

FRONT PANEL CONTROLS AND INDICATORS

POWER	Illuminated On/Off Rocker Power Switch Lit when unit is powered on
CHECK	Red Illuminated Check Button Verifies Tester Operation
RESET	Green Illuminated Reset Button
ADJUST / ENTER DIAL	Allows for Easy Scrolling through on Screen Menu Fields and Adjustment of Parameters and Test Levels
LCD DISPLAY	480 x 272 Pixel High Resolution Graphical Color LCD with white LED Back-lit, 4.2" Diagonal Size
KEYS	MENU: Displays Main Menu
	LOCAL: Returns Front Panel Control
	ESC: Backs up or Undo Last Entry
	LOCK: Locks out Front Panel Control
	VOLT1 to VOLT3: Selects Preset Test Level
	TRIP1 to TRIP3: Sets Preset Trip Level
TERMINALS	Range: 0 – 3000 V Safety Rated: 6000V max.
TEST PROBES	High Voltage Detachable Probes with Leads
	Safety Retractable Probe Tips
	Easily Replaceable after Wear

PHYSICAL

MODEL	**1656**	**1657**
FORM FACTOR	19" Rack mount Steel Chassis	Bench Top Steel Chassis
DIMENSIONS[2]	W: 426 mm / 16.75"	W: 340 mm / 13.4"
	H: 89 mm / 3.5"	H: 140 mm / 5.5"
	D: 254 mm / 10.0"	D: 336 mm / 13.2"
Shipping:	559 x 152 x 356 mm 22 x 6 x 14"	470 x 275 x 497 mm 18.5" x 10.8" x 19.6"
WEIGHT	Net: 6.8 Kg / 15 lbs.	Net: 6.7 Kg / 14.8 lbs.
Shipping:	9 Kg / 20 lbs.	8.2 Kg / 18 lbs.

FEATURE COMPARISON 1652 VERSUS 1656 / 1657

Feature	**1652 (Legacy)**	**1656 / 1657**
Test for SHORTS	YES	**YES**
Test for OPENS	NO	**YES**
Front Panel Setups	NO	**YES**
Large Color LCD Display	NO	**YES**
Remote Control Interfaces	NO	**USB, RS232, RS485**
Programmable Test Time	NO	**YES**
Calibration Reminder	NO	**YES**
PLC Interface	NO	**YES**

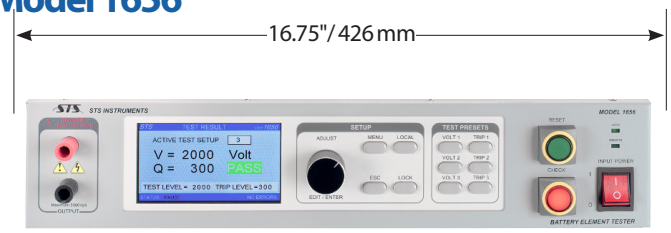
Front and Rear Panel Layout and Connectors

Model 1657

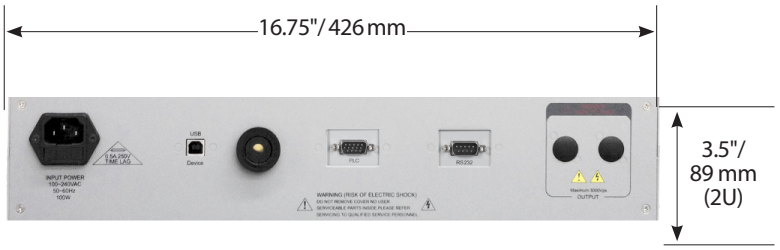
The STS 1657 is designed for bench top use.

The STS 1657 Rear Panel provides connections for AC Input, USB interface, PLC I/O and RS232 interface option.

Model 1656



The STS 1656 is designed for bench top or 19" equipment rack use. Shown without optional rack mount handles.



The STS 1656 Rear Panel provides connections for AC Input, USB interface, PLC I/O and RS232 interface option.

Auto Line Probe Switch Matrix Option

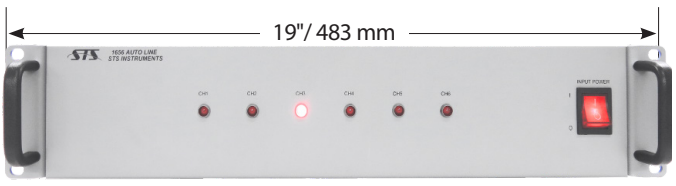
- Increased Lead-Acid Battery Quality
- Supports High-Speed Automated Production Lines
- Shorten Test Times by Testing Six Cells per Test Cycle
- Tests Up To Six Cells per Battery every 1.2 seconds
- Interfaces with PLC Controllers
- Remote computer interfaces for data collection and control

The STS Instruments 1656 Auto-Line Option accessory provides automated testing of batteries with up to six elements using automated probing systems.

The Auto-Line routes test signal and measurements up to six available channels under control of the BET.

All high voltage connections are made at the rear panel of the Auto-Line unit and routed to the multi-channel test head (not included with Auto-Line option).

1656 Auto Line Option Front and Rear Panel Layout and Connectors



The STS Auto-Line option is designed for bench top or 19" equipment rack use. Shown with rack mount handles.

The STS Auto-Line Option Rear Panel provides connections High Voltage Leads, Control interface and AC Line input.

Ordering Information

MODEL NUMBER	DESCRIPTION	NOTES
STANDARD MODELS		
1656-PLC 1657-PLC	Battery Element Tester (BET)	Supplied with: • USB Interface, PLC I/O • Set of High Voltage Safety Test Leads, 1.8 m / 6 ft. long • Operator Manual and Owners Manual • Spare AC Input Fuses (2) • Certificate of Calibration • AC Line Cord (detachable)
1656 -PLC-232 1657-PLC-232	BET with RS232 Serial Interface	• Adds RS232 Interface in addition to USB
1656-PLC-485 1657-PLC-485	BET with RS485 Serial Interface	• Adds RS485 multi-drop Interface in addition to USB
1656-PLC-RPC 1657-PLC-RPC	BET with Rear Panel HV Connect	• Provides rear panel mounted test probe connections
AUTO LINE UNIT		
1656 AUTO LINE	Six Channel HV Multiplexer for auto-production line fixture testing.	Requires 1656-PLC-RPC or 1657-PLC-RPC Supplied with: • Auto Line Operator Manual • AC Line Cord (detachable)
1652 COMPATIBILITY OPTIONS		
1657-PLC-TT	Adds TT1652 Option	Modifies PLC Test Input to emulate 1652 Trigger mode. See TT1652 Data sheet for details.
1657-PLC-070	BET with Model 070 Adapter attached to top cover	Designed to replace 1652-070 field units. Attaches 995-017-907B module adapter to 1657-PLC-TT BET
Type 070 Adapter	P/N 995-017-907B for use with 1657-PLC-TT	Converts 115Vac to isolated low level PLC Test input signal and provides 115Vac Test Fail output. May be ordered separately. Requires 1657-PLC-TT BET to operate. See Type 070 Data sheet for details.
ACCESSORIES (P/N)	**DESCRIPTION**	
102-050-919	Test Probe Assembly Kit 1.8 m /6 ft. long	
200025	Test Probe Assembly, **Red**, 1.8 m /6 ft. long	
200026	Test Probe Assembly, **Black**, 1.8 m /6 ft. long	
200386	Test Probe Assembly, **Red**, 3 m / 10 ft. long	
200387	Test Probe Assembly, **Black**, 3 m / 10 ft. long	

102-050-919
BET High Voltage Probe Kit

Worldwide Service and Support

STS Instruments' customer support is second to none. Our Customer Support Program provides the training, repair, calibration, and technical support services that our customers value. We provide excellent support before, during and after the sale.

For customers with many Battery Element Testers, a portable calibration station is available.

See the STS1600CS data sheet for details.

Product Warranty

Warranty Period: One year.

Complete calibration and repair services are offered at our USA, United kingdom and China manufacturing facilities (see contact info below). Calibrations are to original factory specifications and are traceable to NIST (National Institute of Standards and Technology). A certificate of conformance accompanies each repaired tester.

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