

Digital Battery Element Tester

Pulse Surge Arc Testing of Lead-Acid Batteries



Model 1656

Key Benefits

- Improve product quality and customer satisfaction
- Short test times to support high volume production test
- Simple user interface for ease of operation and reduced training cost
- Large, easy to read color LCD with white LED backlight and audible alarm provides clear Pass/Fail indications
- Remote computer interfaces for data collection for statistical process control
- Detachable safety probes ensure operator safety and easy replacement as needed



Tester Description

The STS Instruments 1656 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 minimizes costly reclamation.

Important Benefits

Increase your product quality and reliability by rigorous in-line high voltage testing of your battery element separator plates during the production process. Reduce field failures, costly recalls and dissatisfied customers by adding the 1656 Battery Element Tester to your Lead Acid Battery production line.

Hidden imperfections in your separator plates are difficult to detect using conventional means. When using traditional AC hi-pot testing to detect such failures, excessive heating can occur in moist cell applications resulting in possible damage of the unit under test.

The 1656 uses a unique short-duration high voltage pulse instead which maximizes stress on the dielectric material for fault detection but induces minimal energy.

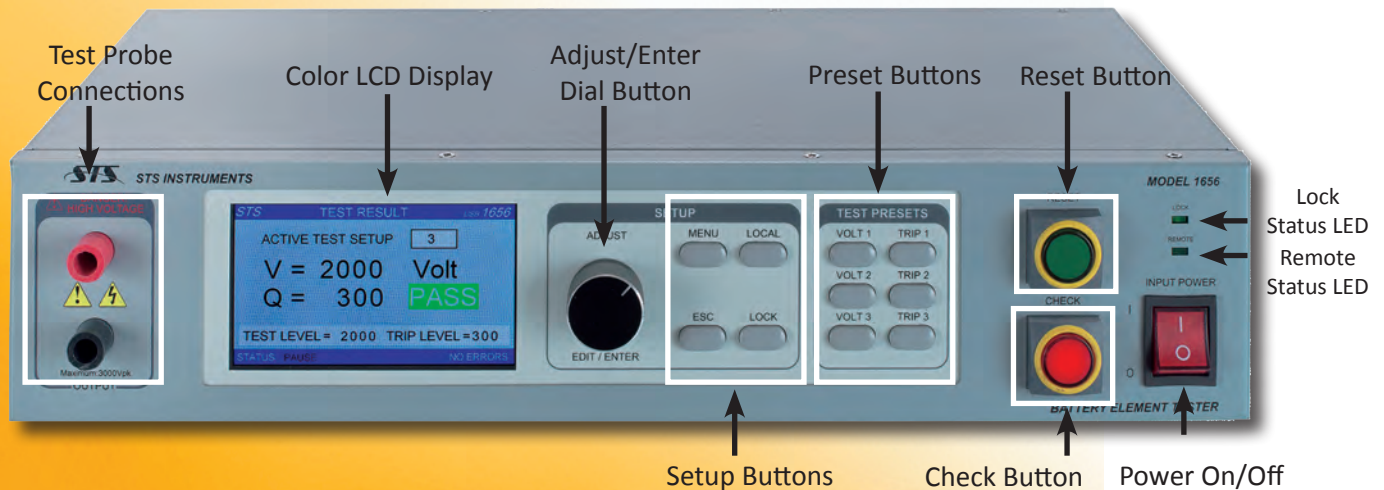
Advanced Technology

The Model 1656 tester uses modern digital technology to obtain new levels of accuracy and fault detection compared to previous generation, analog battery element testers. Sporting an easy to read full color display and simple menu driven user interface, the 1656 represents a significant step forward in ease of use.

The 1656 offers fully adjustable test voltage with a peak output capability of 3000 volts, accommodating a wide range of separator spacings and types. Durable solid state switching of the high voltage output assures reliability for high volume applications.

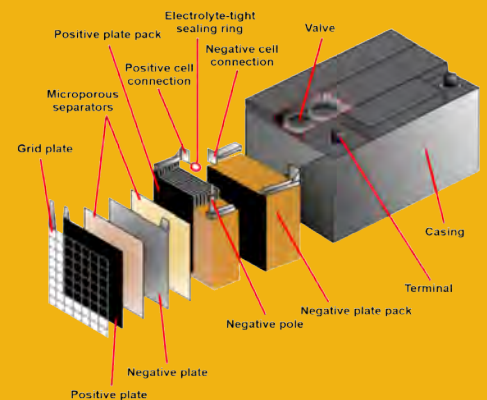
Easy-to-read readouts for applied test voltage and quality reading make this unit very operator friendly, requiring minimal training and setup. Operation is go/no-go, and requires no operator interpretation of results. The test voltage is applied using included safety probes. When a failure occurs, the high voltage is shut off and both audible and visual alarms warn the operator of any failure.

Easy Front Panel Operation



APPLICATIONS

- Automotive Engine Starting, Lighting and Ignition Batteries (SLI)
- Power Backup and Energy Storage System Batteries
- Traction Application Batteries
- Most Battery Types with Separators



Technical Specifications

OUTPUT VOLTAGE

RANGE	300 to 3000 Volts
RESOLUTION	10 V
ACCURACY	± 2.0%
SHAPE	Pulse
DURATION	15 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	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 Backlit, 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
TERMINALS	VOLT1 to VOLT3: Selects Preset Test Level
	TRIP1 to TRIP3: Sets Preset Trip Level
TEST PROBES	Range: 0 – 3000 V Safety Rated: 6000V max.
	High Voltage Detachable Probes with Leads
	Safety Retractable Probe Tips Easily Replaceable after Wear

PHYSICAL

FORM FACTOR	19" Rack mount Steel Chassis Removable Rack Ears/Handles for Bench Use
DIMENSIONS²	Width: 483 mm / 19" (incl. removable rack ears) 426 mm / 16.75" (excl. rack ears)
	Height: 89 mm / 3.5"
	Depth: 254 mm / 10.0"
	Shipping: 559 x 152 x 356 mm (W x H x D) 22 x 6 x 14"
WEIGHT	Net: 6.8 Kg / 15 lbs.
	Shipping: 9 Kg / 20 lbs.

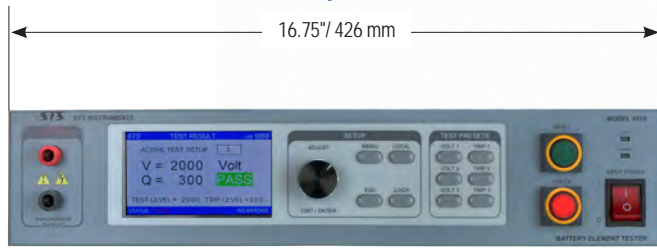
FEATURE COMPARISON 1652 VERSUS 1656

Feature	1652	1656
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

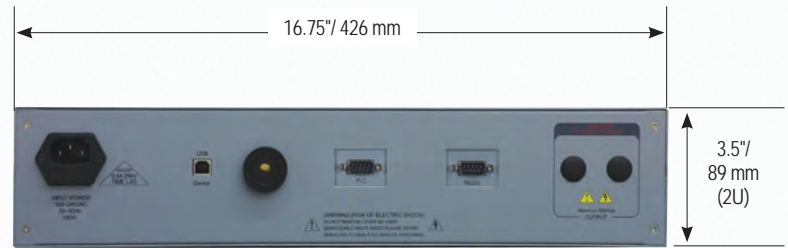
Note 2: For replacement of older 1652 BET models where 19" rack width is not available, a bench version of the 1656 is available. Contact factory for details.



Front and Rear Panel Layout and Connectors



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.

Ordering Information

MODEL NUMBER	DESCRIPTION	NOTES
STANDARD MODELS		
1656-PLC	Battery Element Tester (BET)	Supplied with: <ul style="list-style-type: none"> • USB Interface, PLC I/O • Set of High Voltage Safety Test Leads, 1.8 m / 6 ft. long • 1656 Operator Manual and Owners Manual • Spare AC Input Fuses (2) • Certificate of Calibration • AC Line Cord (detachable)
1656-PLC-232	BET with RS232 Serial Interface	• Adds RS232 Interface in addition to USB
1656-PLC-485	BET with RS485 Serial Interface	• Adds RS485 multi-drop Interface in addition to USB
1656-PLC-RPC	BET with Rear Panell HV Connect	• Provides rear ranel mounted test probe connections
AUTO LINE UNIT		
1656 AUTO LINE	Six Channel HV Multiplexer for auto-production line fixture testing.	Requires 1656-PLC-RPC Supplied with: <ul style="list-style-type: none"> • Auto Line Operator Manual • AC Line Cord (detachable)
1652 COMPATABILITY OPTIONS		
1656-PLC-TT	Adds TT1652 Option	Modifies PLC Test Input to emulate 1652 Trigger mode. See TT1652 Datasheet for details.
1656-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 1656-PLC-TT BET
Type 070 Adapter	P/N 995-017-907B for use with 1656-PLC-TT	Converts 115Vac to isolated low level PLC Test input signal and provides 115Vac Test Fail output. May be ordered seperately. Requires 1656-PLC-TT BET to operate. See Type 070 Datasheet for details.
ACCESSORIES (P/N)		
102-050-919	Test Probe Assembly Kit	Set of Safety Retracting Red & Black Probes with 1.8 m / 6 ft. leads
200025	Test Probe Assembly, Red	Safety Retracting Probe, Red with 1.8 m / 6 ft. lead
200026	Test Probe Assembly, Black	Safety Retracting Probe, Black with 1.8 m / 6 ft. lead
200386	Test Probe Assembly, Red	Safety Retracting Probe, Red with 3 m / 10 ft. lead
200387	Test Probe Assembly, Black	Safety Retracting Probe, Black with 3 m / 10 ft. lead

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. So, in addition to receiving the right test equipment, our customers can also count on excellent support before, during and after the sale.

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. See www.stsinstruments.com for contact info.



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