

I modelli proposti

Tester prova batterie

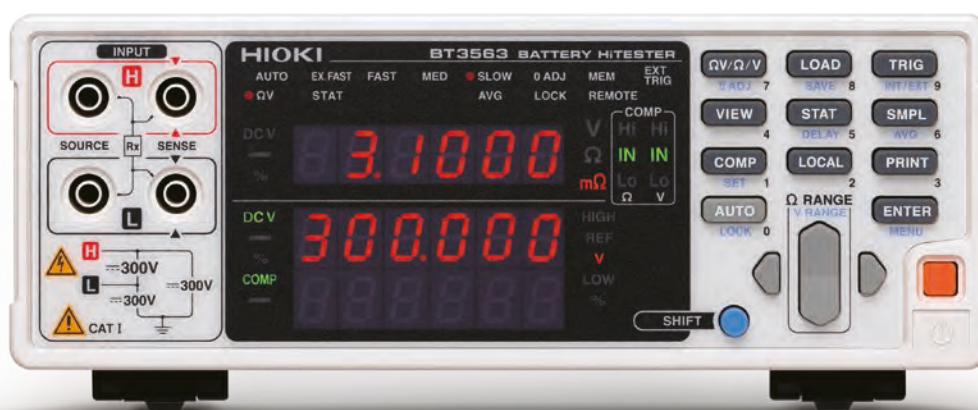


	BT4560	BT3563	BT3562	3554
Settori di utilizzo	Linea di Produzione, Controllo Qualità, Ricerca & Sviluppo	Linea di Produzione, Controllo Qualità, Ricerca & Sviluppo	Linea di Produzione, Controllo Qualità, Ricerca & Sviluppo	Manutenzione preventiva, verifiche periodiche
Applicazione tipica	Batterie Li-ion: verifica dell'impedenza, grafico Cole-Cole plot e analisi del circuito equivalente	Batterie ad alta tensione, pacchi batteria di grande dimensione, batterie per veicoli elettrici, batterie di soccorso e per elettronica, NiMH, Li-ion	Batterie di grande dimensione, batterie per veicoli elettrici, batterie di soccorso e per elettronica, NiMH, Li-ion	Batterie di grande dimensione, batterie per veicoli elettrici, batterie di soccorso e per elettronica, NiMH, Li-ion
Misura a 4 terminali	•	•	•	•
Portate di tensione	1 portata: 5V	3 portate: 6V-60V-300V	2 portate: 6V-60V	2 portate: 6V-60V
Tensione Massima Ammessa	5Vcc	300Vcc	60Vcc	60Vcc
Risoluzione in tensione	10uV	10uV	10uV	1mV
Precisione base in tensione	±0.0035%	±0.01%	±0.01%	±0.08%
Portate di resistenza	3 portate: 3 - 10 - 100mΩ	7 portate da 3mΩa 3000Ω	7 portate da 3mΩa 3000Ω	4 portate da 3mΩa 3Ω
Risoluzione in resistenza	0.1uΩ	0.1uΩ	0.1uΩ	1uΩ
Precisione base in resistenza	±0.4%	±0.5%	±0.5%	±0.8%
Segnale di prova	da 0.1 a 1050Hz	1kHz ± 0.2Hz	1kHz ± 0.2Hz	1kHz ± 30Hz
Velocità di risposta	0.1 secondi	8 msec	8 msec	1 secondo
Misura di temperatura	•	-	-	•
Check in prova del buon contatto	•	•	•	•
Funzione di azzeramento delle connessioni	•	•	•	•
Funzione comparatore	•	•	•	•
Funzione di calcolo statistico	-	•	•	-
Memoria per le condizioni di prova	126 impostazioni	126 impostazioni	126 impostazioni	200 impostazioni
Memoria per i dati misurati	-	400 valori	400 valori	4800 set di valori
Interfaccia EXT I/O	•	•	•	-
Interfaccia RS232	•	•	•	-
Interfaccia USB	•	-	-	•
Interfaccia GP-IB	-	su BT3563/01	su BT3562/01	-
Uscita analogica del valore di resistenza	-	su BT3563/01	su BT3562/01	-
Software per computer	•	•	•	•
Alimentazione	da rete	da rete	da rete	8 batterie LR6

BT3563

Soluzione top gamma, 3 portate di tensione fino a 300V, per qualsiasi tipologia di batteria

Top range solution, 3 voltage ranges up to 300V, for any type of battery



BT3563 può testare con la massima precisione e velocità qualsiasi tipologia di batteria: batterie ad alta tensione, pacchi batteria di grande dimensione, batterie per veicoli elettrici, batterie di soccorso e per elettronica nonché qualsiasi tecnologia costruttiva: al gel, al piombo, a vaso aperto, ermetiche, NiMH, Li-ion...

Precisione 0.5%, risoluzione 0.1uΩ, velocità di risposta 8msec, connessione a 4 terminali con segnale di prova a 1kHz per evitare qualsiasi interferenza di misura.

EXT I/O ed RS232 in dotazione, GP-IB ed uscita analogica disponibili sulla versione avanzata BT3563/01.

BT3563 can check any type of battery with the maximum accuracy and speed: high-voltage battery, large-scale battery packs, electric vehicles batteries, emergency and electronic batteries as well as any construction technology: gel, lead acid, hermetic, NiMH, Li-ion ...

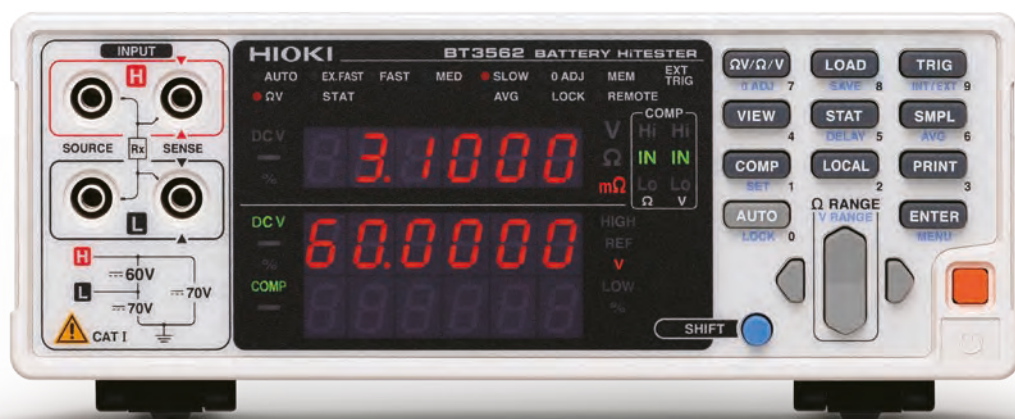
0.5% accuracy, 0.1uΩ resolution, 8msec fast response, 4-terminal connection with 1kHz test signal to avoid any interference measurement.

EXT I/O and RS232 included, GP-IB and analog output available on BT3563/01 advanced version.

BT3562

Test su batterie con tensione fino a 60V

Tests on batteries up to 60V



BT3562 è dedicato alle batterie per veicoli elettrici ed ibridi anche di grande potenza nonché per batterie di soccorso e per elettronica.

2 portate di tensione a 6V e 60V, precisione 0.5%, risoluzione 0.1uΩ, velocità di risposta 8msec, connessione a 4 terminali con segnale di prova a 1kHz per evitare qualsiasi interferenza di misura.

EXT I/O ed RS232 in dotazione, GP-IB ed uscita analogica disponibili sulla versione avanzata BT3562/01.

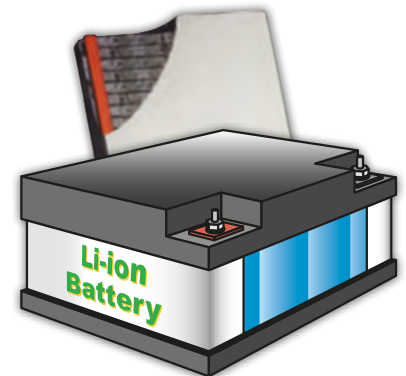
BT3562 is dedicated to batteries for electric and hybrid vehicles also of great power as well as emergency batteries and electronics.

2 voltage ranges from 6V to 60V, 0.5% accuracy, 0.1uΩ resolution, 8msec response speed, 4-terminal connection with test signal 1kHz to avoid any interference measurement.

EXT I/O and RS232 included, GP-IB and analog output available on BT3562/01 advanced version.

Resistance and voltage measurements to confirm finished quality

BATTERY HiTESTER BT3563 BT3562



Measurement Parameters and Applications

- High-voltage battery pack testing
- Battery module testing
- Large (low-resistance) cell testing
- High-speed mass production testing of coin batteries
- Fuel cell stack measurements
- Battery research and development measurement applications
- For high-speed production line testing of small battery packs for mobile and portable communications devices
- For high-speed production line testing of small cells
- *High-speed 10ms inspection in the 300mΩ and 3Ω ranges*
- *Improve inspection efficiency during mass production of compact cells*

BT3563
Up to
300V

BT3562
Up to
60V



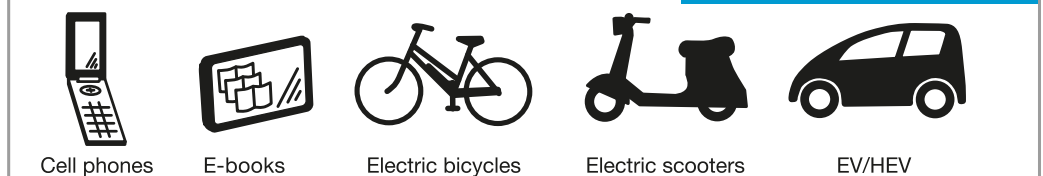
Voltage measurement ranges: 6V/60V/300V (BT3563)
6V/60V (BT3562)

Resistance measurement ranges: 3mΩ/30mΩ/300mΩ/
3Ω/30Ω/300Ω/3000Ω

Lithium-Ion and Secondary Batteries



Battery-Powered Devices



Advanced Functions

● Four-Terminal AC Method

The four-terminal, 1-kHz AC method uses four contact probes to measure resistance independently of that of the measurement leads.

● Measurement Error Detection

Detects test probe contact failure and broken leads, for 100% measurement reliability.

● Self-Calibrating

Minor drift and gain fluctuations within the internal measurement circuitry are automatically corrected to maintain high accuracy.

● Averaging Function

Stable readings can be consistently obtained by averaging two to 16 measurements.

Features of Battery HiTester Series

High Precision

Resistance
 $\pm 0.5\%$ rdg. ± 5 dgt.
Voltage
 $\pm 0.01\%$ rdg. ± 3 dgt.

High Resolution

Resistance: $0.1 \mu\Omega$
(3 m Ω range)
Voltage: 10 μV
(6 V range)

Quick Response

Resistance & Voltage
Simultaneous measurements
within 18 ms^{*2}

^{*2} Sampling time + response time:
with EX.FAST sampling

- The 3 m Ω range (with 0.1 $\mu\Omega$ resolution) is ideal for testing ever lower-resistance large cells.
- The 6 V range (with 10 μV resolution and 0.01% accuracy) is ideal for the high-precision voltage measurements required for cell testing.

- Provides high-speed measurement of high-voltage^{*3} battery packs, for improving productivity (BT3563).

^{*3} BT3563: up to 300V
BT3562: up to 60V

Battery HiTester Series

● Measurement Value Storage

Store up to 400 measurement values by external trigger input, for bulk transfer to a computer.

● Statistical Calculations

Apply statistical calculations to up to 30,000 data points to facilitate process and quality control.

● Save Measurement Setting Configurations

Up to 126 measurement configurations such as comparator setting criteria can be saved and reloaded. Saved configurations can be selected by external control.

Automatic Testing Lines

High Speed Interfaces

The fastest 10 ms measurement data can be transferred via the standard RS-232C interface at up to 38,400 bps.

Models with the -01 suffix include a GP-IB interface.

Handler Interface

Triggering, measurement configuration loading, and zero adjustment can be externally controlled. Output signals provide comparator results, end-of-measurement events, and measurement errors.

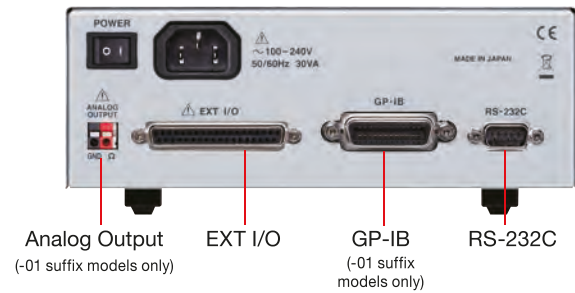
External I/O Items	
Input (no-voltage contacts ¹⁾)	Output (open collector ¹⁾)
<ul style="list-style-type: none"> • Measurement trigger (TRIG) • Print (PRINT) • Zero adjustment (OAdj) • Calibrate (CAL) • Manual comparator (MANU) • Load panel settings (7 bits) (LOAD0 to LOAD6) 	<ul style="list-style-type: none"> • End-of-Measurement (EOM) • Measurement-in-progress (INDEX) • Comparator results (R-Hi, R-IN, R-Lo, V-Hi, V-IN, V-Lo, PASS, FAIL²) <small>² FAIL is BT3563 and BT3562 only</small> • Measurement error (ERR) • General-purpose output (OUT1 to OUT9) (only 3561)

¹ The input and output signals of the BT3563 and BT3562 are isolated via photocouplers.

EXT I/O Connectors (accessories not supplied)

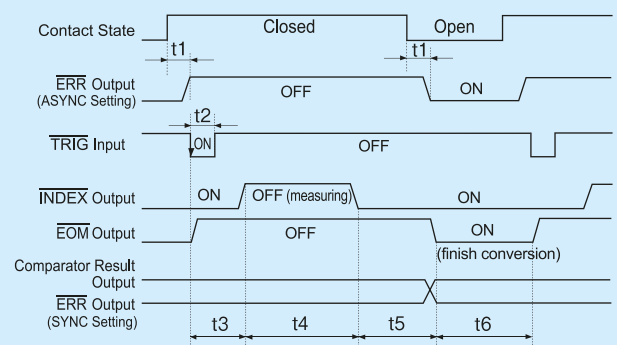
Installed connector (HiTester side): 37-pin D-SUB accepts #4-40 screws
 Mating connectors: DC-37P-ULR (solder type) or DCSP-JB37PR (welded type) from Japan Aviation Electronics Industry, Ltd., or equivalent

BT3563-01 and BT3562-01 Rear Panel



External I/O Timing Chart

(relative signal voltage levels)



t1: 1.5 ms (ERR output response time) t2: Minimum 0.5 ms (measurement trigger pulse width)
 t3: Setting-dependent (delay time) t4: 7.8 ms (measurement time)³
 t5: 0.3 ms (calculation time) t6: Latched until next trigger (with HOLD setting enabled)
³ Function: ohm-volt sampling, with EX FAST setting

Comparator Functions

● Judges Resistance & Voltage Simultaneously

Resistance and voltage can be simultaneously judged Hi/IN/Lo by independent comparators. Judgment results are provided on the display, beeper, and external I/O. The display allows confirming both results at a glance.



Resistance comparator settings



Voltage comparator settings



● Composite Judgment Result Output

External I/O provides both separate and combined outputs of resistance and voltage judgment results, so composite results can be monitored.

● Alternative Setting Methods

Set judgment thresholds by specifying high/low (Hi/Lo) values or by specifying a standard value and deviation (%).

● Manual Comparator

Comparator judgments can be executed only when required, supporting flexible control by footswitch or PLC.

● Dual Beep Tones

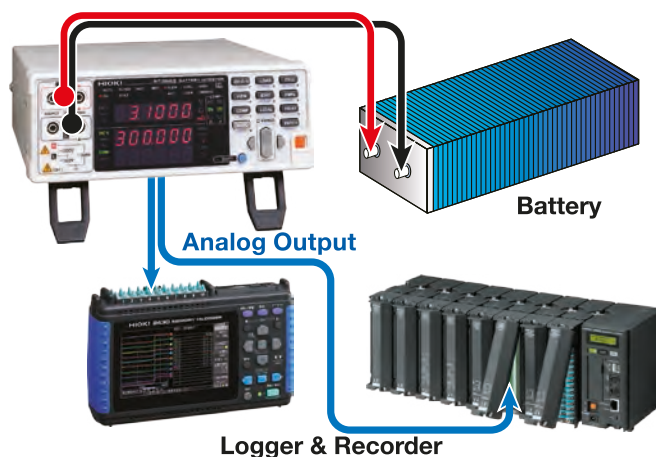
Different beep tones distinguish IN and Hi/Lo judgments. Both tones can be independently enabled or disabled.

Multiple Recording Methods

Analog Output (BT3563-01 and BT3562-01 only)

The BT3563-01 and BT3562-01 provide analog output of resistance measurement values. This is convenient for combining recorded data from multiple locations or of various data types, such as for logging long-term measurements and for fuel cell evaluation.

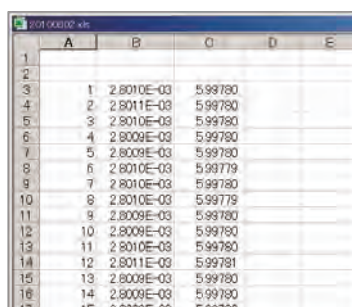
Output contents	Measured resistance (displayed value)
Output rate	0 to 3.1 V DC (corresponding to displayed value of 0 to 31000)
Resolution	12 bits
Response time	10 ms



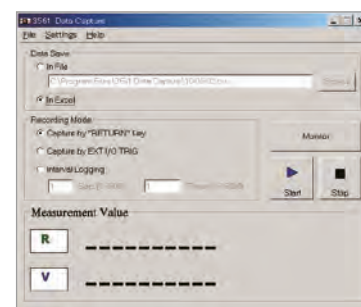
PC Application Program

Measurement data can be transferred to a PC for importing to a spreadsheet program or storage as CSV files. Interval and manual measurements can be triggered by a keystroke or external trigger signal.

Download the PC application program from our website: <http://www.hioki.com/>



Excel Import Example



Program Screen Shot

Specifications

● BT3563 and BT3562 Specifications

Measurement types	Resistance and voltage
Resistance measurement method	Four-terminal AC (1-kHz) method
Functions	Ω V, Ω and V
Rated voltage	[BT3563(-01)] ±300V DC rated input voltage ±300V DC maximum rated voltage to ground [BT3562(-01)] ±60V DC rated input voltage ±70V DC maximum rated voltage to ground
Input resistance	[BT3563(-01) and BT3562(-01)] 3m Ω /30m Ω /300m Ω ranges: Approx.90k Ω 3 Ω /30 Ω /300 Ω /3000 Ω ranges: Approx.1M Ω
Sampling rate	Four steps – Extra Fast, Fast, Medium or Slow
Response time	[BT3563(-01) and BT3562(-01)] Approx. 10 ms for measurements Note: Response time depends on reference values and the measurement object.
Total measurement time	Sampling time + Response time
Zero-adjustment	1000-count range (both resistance and voltage)
Triggering	Internal or external
Delay time	On/off, 0 to 9.999 seconds
Averaging samples	On/off, 2 to 16 samples
Statistical calculations	Total data count; valid data count; maximum, minimum and average values; standard deviation; population standard deviation and process capability indices
Measurement value output function	Measurement values are output via RS-232C upon trigger input
Measurement value memory	Up to 400 measurements
Panel save/load	Up to 126 configuration settings Save Frequently Used Settings in Memory: Measurement function, resistance measurement range, auto-range setting, zero-adjust setting data, sampling rate, trigger source, delay setting, averaging and comparator settings, statistical calculation setting, display switching and key-lock.
Analog Output	Measured resistance (displayed value, from 0 to 3.1 V DC)
External interface	External I/O, RS232C (9600, 19200 or 38400 bps), Printer RS-232C (all models), GP-IB (Model BT3563-01, BT3562-01)
Other functions	Over-range display, measurement error detection, self-calibration, dual comparators, key-lock

● BT3563 and BT3562 General Specifications

Operating temperature & humidity	0 to 40°C, 80% rh or less (non-condensating)
Storage temperature & humidity	-10 to 50°C, 80% rh or less (non-condensating)
Guaranteed accuracy temperature & humidity	23°C ±5°C, 80% rh or less (non-condensating)
Operating conditions	Indoors, below 2000 m ASL
Rated supply voltage	100 to 240 V AC (auto-selecting)
Rated supply frequency	50/60 Hz
Rated power consumption	30 VA
Insulation withstand potential	[BT3563(-01), BT3562(-01)] 1.39 kV AC for 15 s (with 10 mA cut-off current) between all mains supply terminals and protective ground terminal 2.224 kV AC for 15 s (with 1 mA cut-off current) between all measurement jacks and interfaces 1.39 kV AC for 15 s (with 1 mA cut-off current) between all measurement jacks and protective ground terminal
Dimensions	Approx. 215W × 80H × 295D mm (without projections)
Mass	Approx. 2.4 kg
Accessories	Power Cord (1)
Applicable Standards	Safety EN61010-1 EMC EN61326 EN61000-3-2 EN61000-3-3

● BT3563 and BT3562

[Sampling Times]

Function	EX.FAST	FAST	MEDIUM	SLOW
Ω V (50Hz)	8ms	24ms	84ms	259ms
(60Hz)			70ms	253ms
Ω (50Hz)	4ms	12ms	42ms	157ms
(60Hz)			35ms	150ms
V (50Hz)	4ms	12ms	42ms	157ms
(60Hz)			35ms	150ms

Items in the parentheses () indicate supply frequency settings; Tolerance: ±5 ms for SLOW sampling, and ±1 ms for other settings.

● BT3563 and BT3562 Conditions of Guaranteed Accuracy

Temperature & humidity:

23 °C ±5 °C, 80% rh or less (non-condensating)

Zero-adjustment: After executing zero-adjustment

Warm-up time: At least 30 min.

Self-calibration:

Unless using SLOW sampling, execute self-calibration after warm-up and restrict temperature fluctuations to within ±2 °C after calibration.

● About Accuracy

Accuracy is calculated from the reading error (±% rdg.) determined by the measurement value and range, and the digit error (± dgt.).

Calculation Example

Measurement value: 1 Ω, Measurement range: 3 Ω

Specified accuracy (from table below): ±0.5% rdg., ±5 dgt.

(A) Reading error (±% rdg.): $1 [\Omega] \times 0.5\% = \pm 0.005 [\Omega]$

(B) Digit error (± dgt.): ±5 dgt. = ±0.0005 [Ω] (at 0.0001 Ω resolution)

(C) Total error (A + B): ±0.0055 [Ω]

Applying total error (C) to the measurement value of 1 Ω gives an error limit of 0.9945 to 1.0055 Ω.

● BT3563 and BT3562 [Resistance Measurement]

Range	3mΩ	30mΩ	300mΩ	3Ω	30Ω	300Ω	3000Ω
Maximum display Value	3.1000mΩ	31.000mΩ	310.00mΩ	3.1000Ω	31.000Ω	310.00Ω	3100.0Ω
Resolution	0.1μΩ	1μΩ	10μΩ	100μΩ	1mΩ	10mΩ	100mΩ
Measurement Current ^{*1}	100mA	100mA	10mA	1mA	100μA	10μA	10μA
Measurement Current Frequency	1kHz ±0.2Hz						
Accuracy ^{*2}	±0.5%rdg.±10dgt.		±0.5%rdg. ±5dgt.				
Temperature coefficient	(±0.05%rdg. ±1dgt.) / °C		(±0.05%rdg. ±0.5dgt.) / °C				
Open-Circuit Voltage	25V peak		7V peak	4V peak			

*1 Measurement current accuracy is ±10%.

*2 30mΩ to 3000Ω ranges: Add ±3 dgt. for EX FAST, or ±2 dgt. for FAST and MEDIUM

3mΩ range: Add ±30 dgt. for EX FAST, or ±10 dgt. for FAST, or ±5 dgt. for MEDIUM

Option Configurations

● Main unit



BATTERY HiTESTER BT3563

BT3563-01 (with GP-IB and analog output)

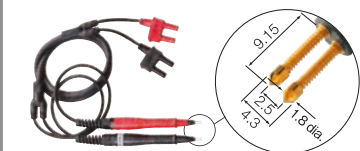
BATTERY HiTESTER BT3562

BT3562-01 (with GP-IB and analog output)

- Measurement leads are not included. Purchase the appropriate lead option for your application separately.
- The male (system side) of the EXT I/O connector is also available. Please inquire with your HIOKI distributor.

● Options (measurement leads)

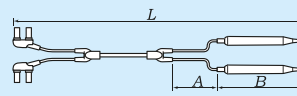
Measurement lead (for measuring high voltage batteries with Models BT3563 and BT3562)



PIN TYPE LEAD L2100

A:300 mm, B:172 mm, L:1400 mm
for high voltage battery measurements, 600 V
DC max., BT3563 and BT3562 only

About probe length



A: between junction and probe
B: probe length
L: between connector and probe tip

Measurement leads (for measuring batteries up to 60 V with BT3563, BT3562)



CLIP TYPE LEAD 9287-10
A:130 mm, B:83 mm, L:1100 mm, DC70V



FOUR TERMINAL LEAD 9453
A:280 mm, B:118 mm, L:1360 mm, DC60V



LARGE CLIP TYPE LEAD 9467
A:300 mm, B:116 mm, L:1360 mm, DC50V

Not CE marked.
29mm diameter

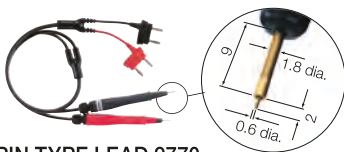
Zero adjustment board (for L2100 only)



ZERO ADJUSTMENT BOARD 9454
for L2100 only

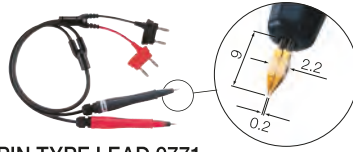
Mainly for Small Secondary Batteries (with very small terminals)

1.8 mm dia. single-axis type for measuring small electrodes



PIN TYPE LEAD 9770 9770 tip shape
A:260 mm, B:140 mm, L:850 mm, DC70V

0.2 mm parallel pyramid-type pins for measuring at thru holes and sub-millimeter objects



PIN TYPE LEAD 9771 9771 tip shape
A:260 mm, B:138 mm, L:850 mm, DC70V

● Options (Interface Cables)

Interface (RS-232C and GP-IB) Connection cables



RS-232C CABLE 9637
9- to 9-pin crossover, 1.8m



RS-232C CABLE 9638
9- to 25-pin crossover, 1.8m