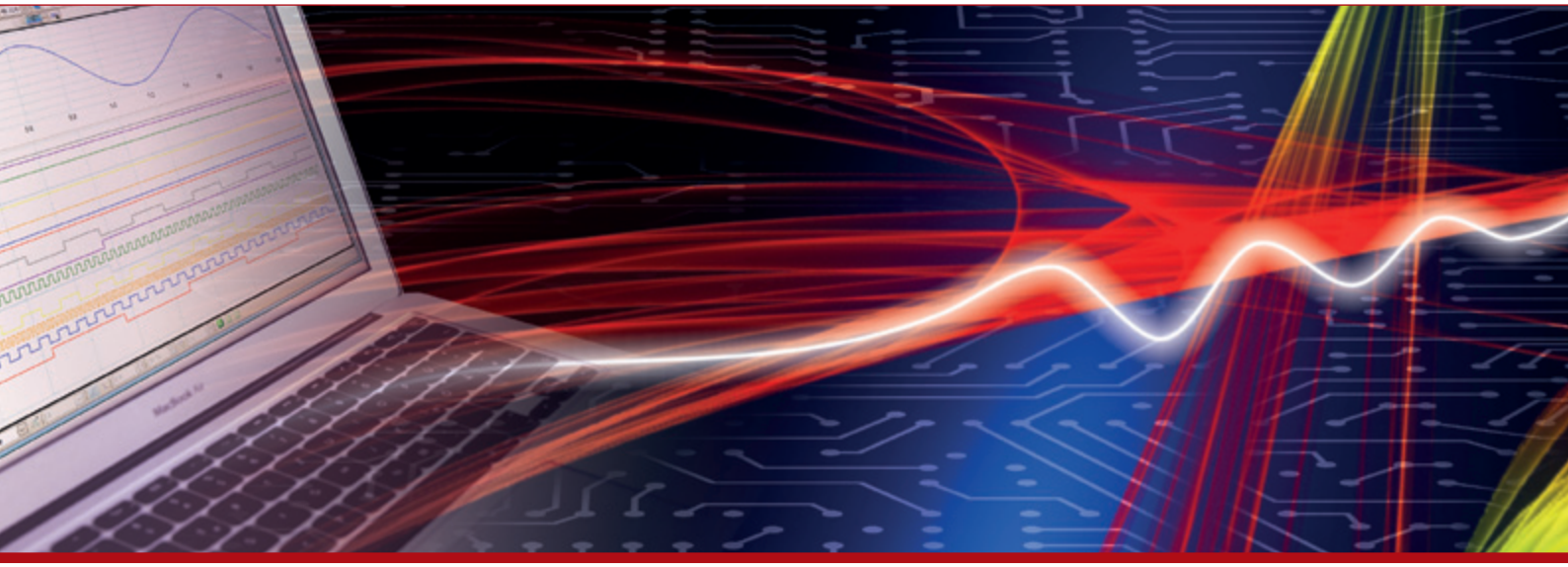
Product Datasheet - Technical Specifications



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HIOKI

AC AUTOMATIC INSULATION/ WITHSTANDING HiTESTER 3174

Featuring contact check functionality

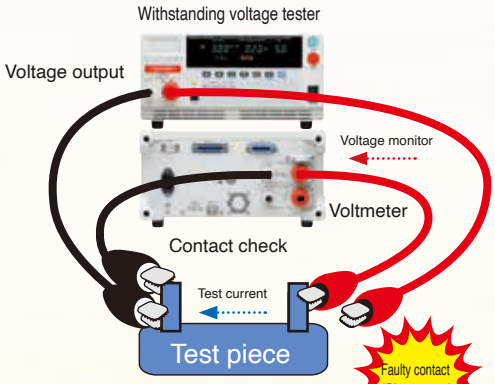
The effects of test lead wire breaks, erroneous test results caused by faulty contact, and fluctuations in test voltage caused by variations in the instrument's supply voltage on withstanding voltage and insulation resistance testing are well known.
The AC Automatic Insulation/Withstanding HiTester 3174 is a low-cost solution featuring contact check functionality as well as a stabilized power supply to prevent the reduced test reliability that can result from these issues.
To streamline production line test processes, the HiTester also features configuration of test parameters via RS-232C and reading of parameters from the EXT I/O interface.

CE 3year Warranty

Improved Test Reliability

● Contact check function improves test reliability

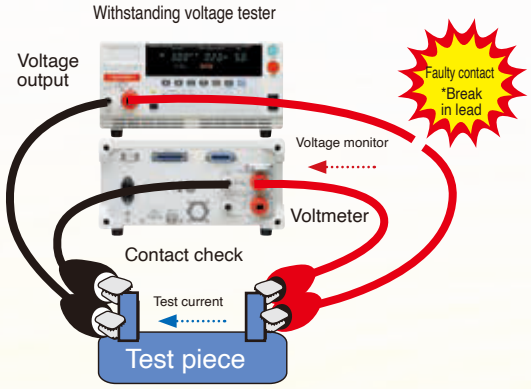
The 3174's contact check function lets you detect test lead wire breaks and faulty contact during testing by sensing measurement issues in real time.



◆ If a test lead were to come lose during testing with a measurement device that does not offer contact check functionality, defective test pieces would be judged to be non-defective.

The 3174 improves test reliability by monitoring voltage to detect lose leads during testing and faulty wiring during measurement.

*Since contact check is performed while testing is in progress, use of contact check functionality does not increase cycle time.
*Requires an additional pair of H.V.TEST LEADS 9615.



◆ If a test lead wire were to break during testing with a tester that does not offer contact check functionality, defective test pieces would be judged to be non-defective.

DANGER lamp
Flashes a warning during testing and whenever high voltage is present at the terminals.
The DANGER lamp turns off when the voltage at the output terminals is no greater than AC 30 V or DC 60 V.

Fluorescent display tube
The display uses a bright, easy-to-read fluorescent tube.

9613 REMOTE CONTROL BOX (SINGLE) (option)

9614 REMOTE CONTROL BOX (DUAL) (option)

External switch
Enables start/stop control by means of the REMOTE CONTROL BOX (SINGLE) 9613 or REMOTE CONTROL BOX (DUAL) 9614. (The 9613 and 9614 are optional.)

Test mode selection
Select from three test modes:
1.Manual test mode: W (withstand voltage testing) / I (insulation resistance testing)
2.Automatic test mode: W→I / I→W

● Judgment output at forced stop

The ability to obtain a judgment even after a forced stop increases testing freedom.

● Continued analytical testing after FAIL judgments

Test pieces can now be analyzed by means of detailed monitoring of the test current accompanying FAIL judgments.

● Ramp timer function

The ramp-up initial value, ramp-up and ramp-down time parameters can be set independently.

● True effective value display

● Eliminate the effects of supply voltage fluctuations

● Delay timer function

Safe, Automated Operation

Convenient

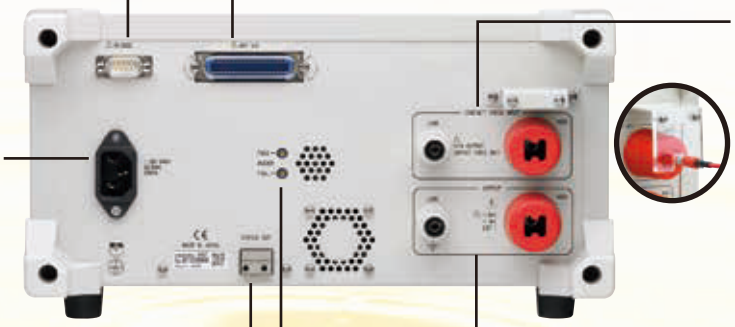
● Continuous full-auto withstanding voltage and insulation resistance testing

The 3174 lets you set independent test conditions including test voltage for withstanding voltage and insulation resistance testing, and you can perform these tests continuously. Press the W→I key to automatically perform withstanding voltage followed by insulation resistance tests, or press the I→W key to automatically perform insulation resistance followed by withstanding voltage tests.

Safe

● Interlock function

Signal input from an external device such as an automatic tester can be used to disable output and prevent testing, ensuring safety during automatic testing and other uses.



RS-232C

Enables remote control.

Power cord inlet

Contact check

LOW: A break in the lead is determined to have occurred when the check current is not detected.
HIGH: A break in the lead is determined to have occurred when the contact check measurement voltage falls outside the range defined by the upper and lower thresholds.
(Connectors are locked in place as shown on the left to prevent the leads from being disconnected.)

*Requires an additional pair of H.V.TEST LEADS 9615.

Status out relay terminals

Maximum input voltage: AC 150 V, DC 30 V
Maximum contact current: 0.5 A

An OR operation applied to various enabled conditions determines whether relay terminal output is turned on.

1. H.V.ON	Output voltage generation
2. TEST	Testing in progress
3. PASS	PASS state
4. FAIL	FAIL state
5. INT.LOCK	Interlocked state
6. READY	Ready state
7. EXT.CONT	Under external control
8. POWER.ON	When the 3174 is on

Rear panel voltage output terminals

The rear panel terminals are connected at all times to the front terminals. When embedding the 3174 HiTESTER inside an automatic tester, connections can be made via the rear panel terminals.

Buzzer volume knobs

The 3174 provides separate volume adjustments for the PASS and FAIL judgment buzzers.

External I/O connector (Signal lines have photocoupler isolation.)

Pin	I/O	Signa	Function
1	OUT	READY	Low in ready state
2	OUT	L-FAIL	Low in FAIL state (lower bound)
3	OUT	U-FAIL	Low in FAIL state (upper bound)
4	OUT	PASS	Low in PASS state
5	OUT	TEST	Low in test sate
6	OUT	H.V.ON	Low when voltage is present at output terminals
7	IN	EXT-E	When low, external I/O input signals are enabled
8	IN	START	When low, same function as START key
9	IN	STOP	When low, same function as STOP key
10	IN	INT.LOCK	Interlock on open
11	OUT	W-MODE	Low during withstanding voltage testing
12	OUT	I-MODE	Low during insulation resistance testing
13	OUT	W-FAIL	Low in FAIL state during withstand voltage testing
14	OUT	I-FAIL	Low in FAIL state during insulation resistance testing
15-18	IN	ISO.COM	Ground inputs for external devices
22-25	IN	MEM-0 to 3	Saved test selected pins
27	IN	MEM-E	When low, enables memory selected pins
28-29	OUT	MODE-0,1	Current test mode
33-36	OUT	ISO.DCV	Internal DC 15 V power supply (100 mA)

■ Interface specifications

EXT I/O : Output signals

Open collector output (with photocoupler isolation)
All active low with a maximum load voltage of DC 30 V
Maximum output current: DC 100 mA per signal
Output saturation voltage: DC 1.5 V or less

Input signals

All active low input (with photocoupler isolation)
Maximum applied voltage: 30 V
High level voltage: from DC 15 V to 30 V, or open
Low level voltage: DC 5 V or less (-6 mA typ.)

EXT SW : Input signals (contact input)

START, STOP, SW.EN (external switch terminal enable)

Output signals

LED activation signal (maximum load current: 40 mA)

Model 3174 Specifications

Withstanding Voltage Testing

【Test Voltage】

Output voltage	: AC 0.2 to 5 kV (50/60 Hz), single-range output
Voltage output method	: PWM switching method (0 V start; voltage can be changed while generating output)
Voltage specification method	: Digital (setting resolution: 0.01 kV)
Output voltage accuracy	: ±1.5% of setting ±20 V
Maximum rated output	: AC 100 VA (5 kV/20 mA) continuous rating
Transformer capacity	: 100VA
Voltmeter	: True effective value display Digital meter: AC 0 kV to 5.00 kV Accuracy: ±1.5% rdg. (1,000 V or less, ±15 V)
Output waveform	: Sine wave
Voltage change rate	: 15% or less (converges to setting within 1 s during change from maximum rated load to no load)
Distortion factor	: 5% or less (tester impedance during measurement with 5 kV output under 40 MΩ load)
Frequency	: 50/60Hz (±0.2%)

【Current Detection】

Current measurement range	: 0.01 mA to 20 mA (2 ranges)
Measurement range	: 10mA/ 20mA
Indicated value	: True effective value display
Measurement ranges and resolutions	: 0.00 mA to 10.00 mA, 0.01 mA (10 mA range) 0.0 mA to 20.0 mA, 0.1 mA (20 mA range)
Measurement accuracy	: ±2% rdg. ±0.05 mA (10 mA range) ±2% rdg. ±0.5 mA (20 mA range)

Insulation Resistance Measurement

【Test Voltage】

Rated voltage	: DC 500 V/1,000 V (positive polarity)
Unloaded voltage	: 1 to 1.2 times rated voltage
Rated measurement current	: 1 to 1.2 mA
Short-circuit current	: 4 to 5 mA (500 V), 2 to 3 mA (1,000 V)
Measurement range	: 0.2 to 2,000 MΩ (500 V), 0.5 to 2,000 MΩ (1,000 V)
Guaranteed accuracy ranges/accuracies	: 0.5 to 999 MΩ (500 V), 1 MΩ to 999 MΩ (1,000 V): ±4% rdg. 1,000 MΩ to 2,000 MΩ: ±8% rdg.
Measurement resolution	: 0.01 MΩ (0.20 MΩ to 19.9 MΩ) 0.1 MΩ (20.0 MΩ to 199.9 MΩ), 1 MΩ (200 MΩ to 2,000 MΩ)
Measured resistance ranges	: 2 MΩ, 20 MΩ, 200 MΩ, 2,000 MΩ (500 V) 4 MΩ, 40 MΩ, 400 MΩ, 2,000 MΩ (1,000 V)

Timers

Setting range	: 0.3 to 999 s
Operation	: When set to on: Display counts down from the set time after start. When set to off: Display indicates time elapsed since start.
Setting resolution/accuracy	: 0.1 s (0.3 to 99.9 s) ±50 ms 1 s (100 to 999 s) ±0.5 s

【Ramp Timers】(Withstand voltage testing)

Setting range	: 0.1 to 99.9 s: Ramp-up and ramp-down can be set independently.
Operation	: Ramp-up: The output voltage increases linearly from the initial voltage to the test voltage over the ramp-up time. Ramp-down: The output voltage decreases from the set voltage to 0 V over the ramp-down time after the test time elapses, and the display counts down from the set time. *The actual ramp-up waveform varies with the load due to the analog response delay.
Setting resolution	: 0.1s

【Delay Timers】(Insulation resistance testing)

Setting range	: 0.1 to 99.9 s
Setting resolution	: 0.1 s

Decision Function

Decision method	: Window comparison method with upper and lower bound settings (digital specification)
Decision results	: UPPER-FAIL: The measured current (measured insulation value) exceeded the specified upper threshold. PASS: The measured current (measured insulation value) fell within the range defined by the specified upper and lower thresholds. LOWER-FAIL: The measured current (measured insulation value) was less than the specified lower bound. UPPER LOWER-FAIL: A testing error occurred, for example due to a failure to generate the set voltage.
Decision processing	: Display, buzzer, and EXT I/O signal output is generated according to each decision result.
Setting range	: AC withstanding voltage: 0.1 to 20.0 mA (upper threshold), 0.1 to 19.9 mA (lower threshold) DC insulation: 0.2 to 2,000 MΩ (500 V) or 1.0 to 2,000 MΩ (1,000 V) for both upper and lower thresholds
Setting resolution	: AC withstanding voltage: 0.1 mA DC insulation: 0.01 MΩ (0.2 to 2.00 MΩ), 0.1 MΩ (2.10 to 20.0 MΩ), 1 MΩ (21.0 to 200 MΩ), 10 MΩ (210 to 2,000 MΩ)

Contact Check

Voltmeter accuracy	: Detection method: Average value detection/effective value conversion Accuracy: Setting ±50 V *Inaccuracy may increase when the waveform is distorted.
Decision results	: Enables the contact check function (does not increase cycle time). LOW: A break in the lead is determined to have occurred when the check current is not detected. HIGH: Upper and lower thresholds for the check detection voltage can be set. A break in the lead is determined to have occurred when the contact check measurement voltage falls outside the range defined by the upper and lower thresholds.
Voltage setting range	: Withstanding voltage testing: 0.20 kV to 5.0 kV (0.01 kV resolution; applies to both upper and lower thresholds)Insulation resistance measurement: Upper threshold of 600 V and lower threshold of 500 V (during 500 V measurement); upper threshold of 1,200 V and lower threshold of 1,000 V (during 1,000 V measurement) (both fixed)

General Specifications

(Accuracy guaranteed for 1 year)

Display	: Fluorescent display tube (digital display)
Monitor functions	: Output voltage, detected current, insulation resistance
Monitor period	: 2 times per second, minimum
Operating temperature range	: 0°C to 40°C, 80% RH or less (non-condensing)
Storage temperature range	: -10°C to 50°C, 90% RH or less (non-condensing)
Temperature and humidity range for guaranteed accuracy	: 23 ±5°C, 80% RH or less (non-condensing) (With warm-up period of at least 10 min)
Supply voltage	: AC 100 to 240 V Designed to tolerate voltage fluctuations of ±10% of the rated supply voltage
Power supply frequency	: 50Hz/ 60Hz
Withstanding voltage	: Power supply to chassis: 1.39 kV at 10 mA for 15 s
Maximum rated power	: 200VA
Dimensions	: Approx. 320 (W) × 155 (H) × 395 (D) mm (excluding protruding parts)
Mass	: Approx. 15 kg
Applicable standards	: EMC: EN61326 Class A, EN61000-3-2, EN61000-3 -3, Safety: EN61010
Included accessories	: H.V.TEST LEAD 9615 (high voltage side and return, 1 each), Power cord, Instruction manual, Disconnection prevention plate

Model : AC AUTOMATIC INSULATION/WITHSTANDING HiTESTER 3174

Model No. (Order Code)

3174

Note: To perform contact checks, please purchase another High Voltage Test Lead 9615 set separately.

*The 9615 is bundled

Input/Output cords

H.V. TEST LEAD 9615
Red, Black each 1, 1.5 m (4.92 ft) length

REMOTE CONTROL BOX (SINGLE) 9613
For Start/Stop control, 1.5m (4.92 ft) cord length

REMOTE CONTROL BOX (DUAL) 9614
For Start/Stop control, 1.5m (4.92 ft) cord length

Other

SAFETY TEST DATA MANAGEMENT SOFTWARE 9267
For PC control application software

RS-232C CABLE 9637
For the PC, 9pin - 9pin, cross, 1.8m (5.91 ft) length

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