

# LTCA-10

*load tap changer analyzer*



**Vanguard Instruments Company, Inc.**  
[www.vanguard-instruments.com](http://www.vanguard-instruments.com)

# LTCA-10

## load tap changer analyzer



The LTCA-10 is Vanguard's transformer winding resistance meter and load tap changer contact analyzer. The LTCA-10 is designed to accurately measure the winding resistance of highly inductive power transformers. The unit's triple resistance-reading input channels can measure three winding resistances simultaneously. Two-wire (Kelvin) connections provide high accuracy and require no lead compensation. A special feature of this device is its ability to measure and graph the resistance trace of a transformer LTC or voltage regulator contact during operation. One resistance input channel is dedicated to this feature. The LTCA-10 provides stable resistance readings of very large transformers by utilizing a 60 Vdc power supply capable of outputting at test current up to 10 Amperes.

### Transformer Load Tap Changer Control

Transformer tap positions can be changed remotely using the unit's built-in transformer load tap changer. This remote-controlled tap changer feature eliminates the need to manually change a transformer's step-up and step-down taps.

### Resistance Reading Features

Three resistance-reading channels can measure resistance from 1 micro-ohm to 500 ohms, and the test current is programmable (1A, 5A, 10A). The LTCA-10 can also be used to measure EHV circuit-breaker contact resistance, motor winding resistance or any low resistance. If the transformer winding temperature is entered, the LTCA-10 can calculate the equivalent resistance value of the winding material (aluminum or copper) at any standard reference temperature. Also, a special test mode can run a test for up to 45 minutes while saving resistance readings at one-minute intervals.

### AC Motor Current Monitoring

One AC current monitoring channel is dedicated to monitoring the LTC voltage regulator motor current during operation. The motor current is also printed on the resistance graph and can help detect LTC voltage regulator motor problems. An AC clamp-on current sensor is provided with the LTCA-10.

### Built-in Safety Features

At the end of each test, the LTCA-10 automatically dissipates the stored energy in the transformer. This discharge circuit will continue to work even if the supply voltage is lost.

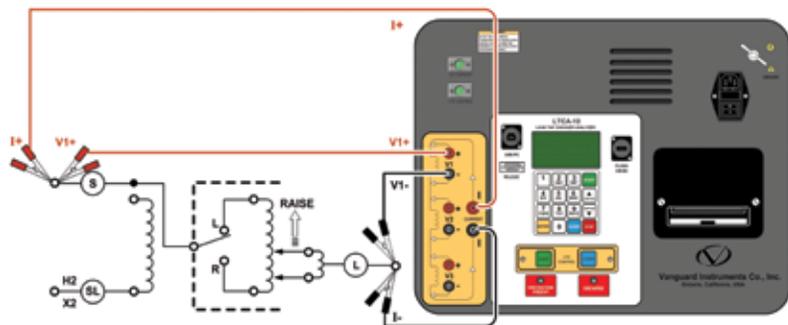
### Dynamic Resistance Test Features

One resistance reading channel is dedicated to dynamic resistance testing. This test can monitor the LTC voltage regulator contact resistance during operation. A resistance graph, plotting resistance over time, can be printed on the built-in thermal printer and is very useful for detecting LTC voltage regulator contact problems.

### Built-in Thermal Printer

The built-in 4.5-inch wide thermal printer can print the breaker contact analysis results in both tabular and graphic formats.

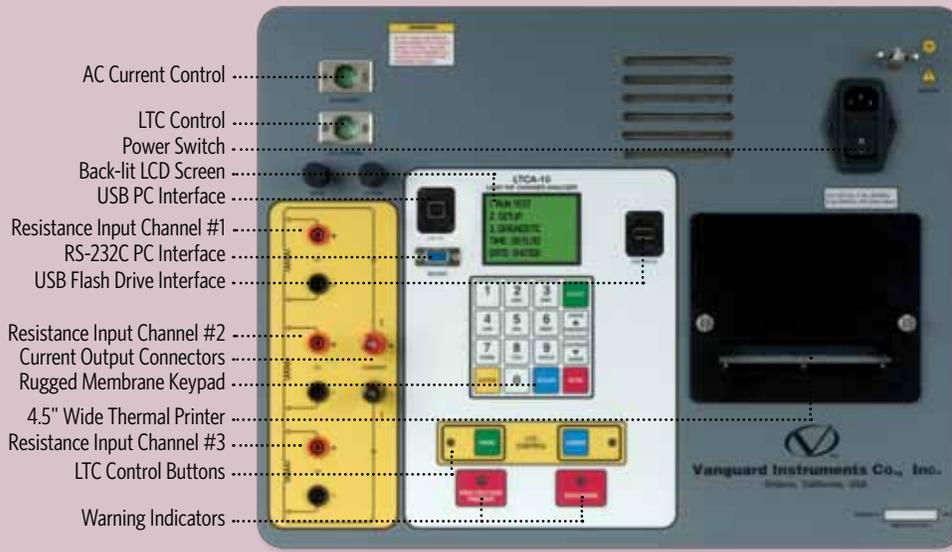
## LTCA-10 connections



## ordering information

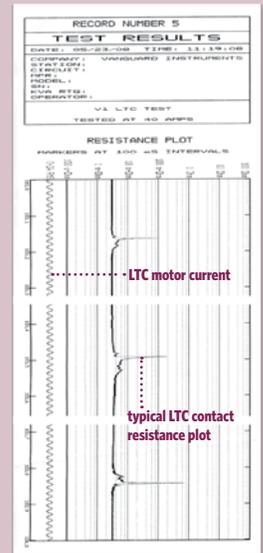
Part number <b>LTCA-10</b>	LTCA-10, cables, software
Part number <b>LTCA-10 CASE</b>	LTCA-10 shipping case
Part number <b>TP4</b>	4.5-inch wide thermal printer paper

# LTCA-10 Controls & Indicators



- AC Current Control
- LTC Control
- Power Switch
- Back-lit LCD Screen
- USB PC Interface
- Resistance Input Channel #1
- RS-232C PC Interface
- USB Flash Drive Interface
- Resistance Input Channel #2
- Current Output Connectors
- Rugged Membrane Keypad
- 4.5" Wide Thermal Printer
- Resistance Input Channel #3
- LTC Control Buttons
- Warning Indicators

## Thermal Printer Output



## User Interface

The LTCA-10 features a back-lit LCD screen (128 x 64 pixels) that is viewable in both bright sunlight and low-light levels. A rugged, alpha-numeric, membrane keypad is used to control the unit.

## Internal Test Record Storage

The LTCA-10 can store 128 static test records (48 tests per record) and 11 dynamic resistance test records in Flash EEPROM. Test records can be recalled locally or transferred to a PC via the available interfaces (RS-232C port, USB port, USB Flash drive port).

## USB Flash Drive and Computer Interface

A built-in USB Flash drive interface provides a convenient method for transferring test records to or from a USB Flash drive. Test records can also be transferred directly to a PC via the RS-232C or USB interface ports. If using a USB Flash drive, test records stored in the LTCA-10's internal memory can be transferred to the drive, and then the supplied PC software can be used to view the test records stored on the drive. Up to 999 test records can be stored on a USB Flash drive.

## LTCA-10 specifications

<b>type</b>	load tap changer analyzer
<b>physical specifications</b>	21"W x 17"H x 9" D (53 cm x 43 cm x 24 cm); Weight: 33 lbs (15.4 kg)
<b>operating voltage</b>	100 – 240 Vac, 50/60 Hz
<b>resistance reading range</b>	1 micro-ohm – 500 ohms
<b>accuracy</b>	1 – 19,999 micro-ohms: ±0.5% reading, ±1 count; 20 – 999 milli-ohms: ±1% reading, ±1 count; 1 – 500 ohms: ±1.5% reading, ±1 count
<b>resistance channels</b>	three static resistance reading channels, One dynamic resistance channel
<b>test voltage</b>	60 Vdc max
<b>test currents</b>	1 ampere, 5 amperes, 10 amperes
<b>ac current input</b>	clamp-on current sensor, 1 – 20 Amperes
<b>display</b>	back-lit LCD Screen (128 x 64 pixels); viewable in bright sunlight and low-light levels
<b>printer</b>	built-in 4.5-inch wide thermal printer
<b>external data storage</b>	one USB Flash drive interface port; stores up to 999 test records on a USB Flash drive (not included)
<b>computer interfaces</b>	one RS-232C port, one USB port
<b>internal test record storage</b>	stores up to 128 static resistance test records (48 tests per record) and 11 dynamic resistance test records
<b>load tap changer contact</b>	Designed to meet IEC 61010 (1995), UL 61010-a, and CAS-C22.2 standards
<b>safety</b>	designed to meet UL 61010A-1 and CAN/CSA C22.2 No. 1010.1-92 standards
<b>environment</b>	Operating: -10°C to +50°C (+15°F to +122°F); Storage: -30°C to +70°C (-22°F to +158°F)
<b>humidity</b>	90% RH @ 40°C (104°F) non-condensing
<b>altitude</b>	2,000 m (6,562 ft) to full safety specifications
<b>cables</b>	one 50 ft. (15.2m) current cable set, three 50 ft. (15.2m) resistance cable sets, ground cable, USB cable, RS-232C cable, LTC cable, power cord, cable bag
<b>options</b>	shipping case
<b>warranty</b>	one year on parts and labor

**NOTE :** the above specifications are valid at nominal voltage and ambient temperature of +25°C (+77°F). Specifications are subject to change without notice.



## Instruments designed and developed by the hearts and minds of utility electricians around the world

Vanguard Instruments Company, (VIC), was founded in 1991. Currently, our 28,000 square-foot facility houses Administration, Design & Engineering, and Manufacturing operations. From its inception, VIC's vision was, and is to develop and manufacture innovative test equipment for use in testing substation EHV circuit breakers and other electrical apparatus.

The first VIC product was a computerized circuitbreaker analyzer, which was a resounding success. It became the forerunner of an entire series of circuitbreaker test equipment. Since its beginning, VIC's product line has expanded to include microcomputer-based, precision micro-ohmmeters, single and three phase transformer winding turns-ratio testers, transformer winding-resistance meters, mega-ohm resistance meters, and a variety of other electrical utility maintenance support products.

VIC's performance-oriented products are well suited for the utility industry. They are rugged, reliable, accurate, user friendly, and most are computer controlled. Computer control, with innovative programming, provides many automated testing functions. VIC's instruments eliminate tedious and time-consuming operations, while providing fast, complex, test-result calculations. Errors are reduced and the need to memorize long sequences of procedural steps is eliminated. Every VIC instrument is competitively priced and is covered by a liberal warranty.



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