

EZCT-2KA

current transformer test set



Vanguard Instruments
A DOBLE COMPANY





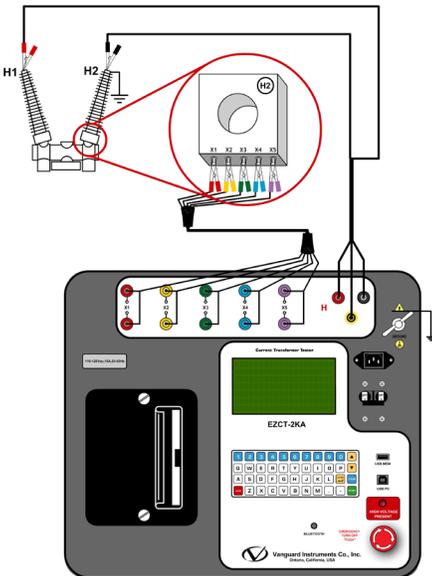
EZCT-2KA

current transformer test set

Product Overview

The EZCT-2KA is Vanguard's third-generation micro-processor-based current transformer test set. The EZCT-2KA can perform the current transformer (CT) excitation test, measure the CT winding resistance and CT current-ratio automatically. All of the EZCT-2KA's test leads can be connected to the CT output terminals (X1, X2, X3, X4 and X5), eliminating the need for lead switching during testing. Test voltage output is automatically raised and lowered by the EZCT-2KA without any operator intervention. With up to 2000 Vac excitation test voltage available, the EZCT-2KA can easily perform excitation tests on very large CT's.

EZCT-2KA connections



Excitation Test

The CT excitation test is performed using the ANSI/IEEE C57.13.1, IEC 60044-1 test method. The test voltage range for the CT excitation test (50 Vac, 300 Vac, 500 Vac, 1200 Vac or 2000 Vac) can be selected, and then the test voltage is raised and lowered automatically by the EZCT-2KA. The excitation test voltage and current data is collected and stored in the unit's internal memory. Any of the 10 possible combinations of X1 to X5 can be tested since all of the unit's test leads can be connected to all of the CT output terminals at the same time. Up to 10 excitation tests can be stored in one record. Once the test is completed, test results can be printed and excitation curves can be plotted on the built-in 4.5-inch wide thermal printer.

CT Ratio and Polarity Tests

The EZCT-2KA determines the CT current-ratio using the ANSI/IEEE C57.12.90 measurement method. A test voltage is applied on any two terminals of the CT (X1 to X5), and the induced voltage is measured through the CT's H1 and H2 terminals. The CT current-ratio is displayed on the screen and stored in memory. The current ratio measuring range is from 0.8 to 10,000 to 1. The CT winding polarity is displayed as a "+" sign (in-phase) or a "-" sign (out-of-phase) and is annotated with the phase angle in degrees.

Demagnetization

The EZCT-2KA automatically demagnetizes the CT under test when performing an excitation test.

Winding Resistance Test

The EZCT-2KA can also measure the DC resistance of the CT winding under test. The DC winding resistance measuring range is from 100 micro-ohms to 20 ohms.

User Interface

The EZCT-2KA features a back-lit LCD screen (240 x 128 pixels) that is viewable in both bright sunlight and low-light levels. A rugged, "QWERTY"-style, membrane keypad is used to control the unit.

Internal Test Record Storage

The EZCT-2KA can store up to 1,000 test records in Flash EEPROM. Each test record may contain up to 10 excitation curves, current-ratio readings, polarity and DC resistance readings. Test records can be recalled and printed on the built-in thermal printer.

External Data Storage

The EZCT-2KA features a standard USB Flash drive interface that makes it very convenient to store and transfer test records and test plans. By plugging in a USB Flash drive, you can quickly transfer your test records and test plans between a computer and the EZCT-2KA without the need to connect the unit to the computer.

Internal Test Plan Storage

The EZCT-2KA can store up to 128 CT test plans in Flash EEPROM. A test plan defines the excitation test voltage and current range selection, CT nameplate ratio, and CT winding terminals (X1 to X5) for each of the tests. Up to 10 test definitions can be stored per test plan. The use of a test plan greatly simplifies the CT testing process; the EZCT-2KA is connected to the CT terminals and a test plan is simply selected and run. Test plans can be created on the EZCT-2KA itself or created on a PC and downloaded to the EZCT-2KA via the unit's built-in USB or Bluetooth interfaces or transferred to the unit using a USB flash drive.

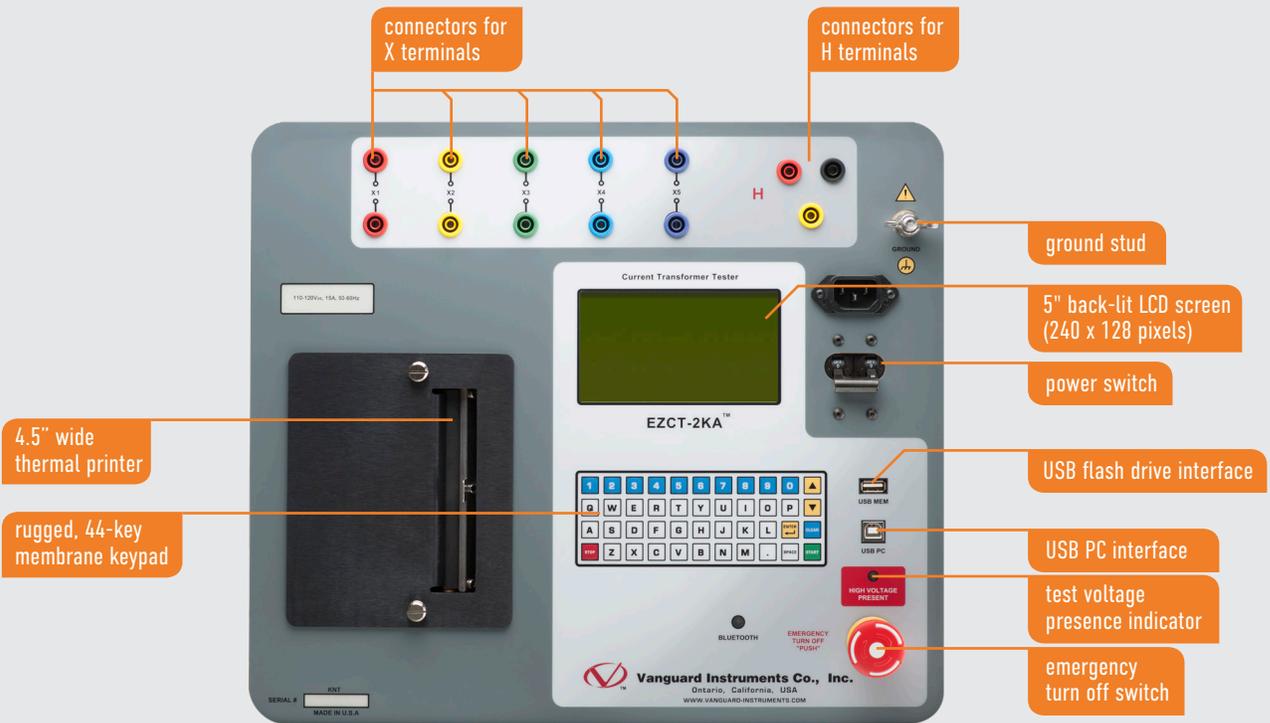
Test Record Header Information

Test record header information can include the company name, substation name, circuit ID, manufacturer, CT serial number, operator's name and test record comments. In addition to the test record header, a 20-character test description for each test in the record (10 tests per record) can also be entered.

ordering information

Part No.	Description
9118-UC	110V EZCT-2KA, cables, and PC software
9119-UC	220V EZCT-2KA, cables, and PC software
9118-SC	EZCT-2KA shipping case
TP4-CS	TP4 thermal printer paper (24 rolls)

EZCT-2KA Features



Computer Interface

The EZCT-2KA can be used as a stand-alone unit or can be computer-controlled via the built-in USB or Bluetooth interface. Windows®-based Current Transformer Analysis software is provided with each EZCT-2KA. This software can be used to retrieve test records from the EZCT-2KA, create test plans, download test plans to the EZCT-2KA, and can also be used to run CT tests from the PC. Tabulated test records can be exported in PDF, Excel, and XML formats for further analysis.

Built-in Thermal Printer

A built-in 4.5" wide thermal printer can print the current transformer test report and plot the excitation curves.

thermal printer output

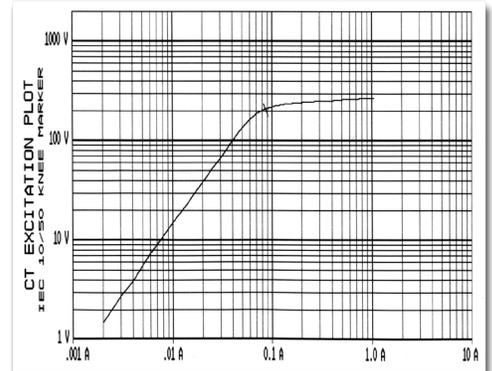
RECORD NUMBER 1
CT EXCITATION TEST RESULTS
 DATE: 01/07/15 TIME: 10:17:25
 COMPANY:
 STATION:
 CIRCUIT:
 MFR:
 MODEL:
 S/N:
 COMMENTS:
 OPERATOR:

TEST NUMBER: 1
 TESTED TAP: X1-X2
 TST NOTE:
 TEST Vtg RANGE: 300 V
 TEST CUR RANGE: 1.0 A
 WINDING RES = 213.0 m-OHMS

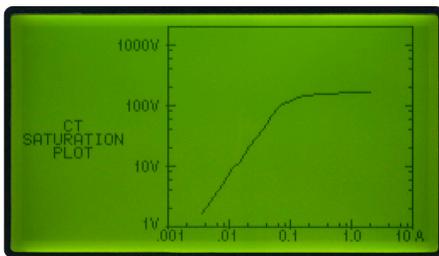
IEC 10/50 V_{kp}: 214.6 VOLTS
 IEC 10/50 I_{kp}: 0.0864 AMPS
 IEEE 30° V_{kp}: 200.2 VOLTS
 IEEE 30° I_{kp}: 0.0732 AMPS
 IEEE 45° V_{kp}: 163.0 VOLTS
 IEEE 45° I_{kp}: 0.0378 AMPS

NAME PLATE RATIO: 1000:5
 MEASURED RATIO: 159.97
 PERCENT ERROR: 0.02 %
 POLARITY: + IN PHASE
 PHASE ANGLE: + 0.04°
 EXCITATION Vtg: 130.6 VOLTS
 EXCITATION CUR: 0.0488 AMPS

BURDEN VA / COS φ	PERCENT RATED CURRENT (5.0 A)			
	50k	100k	125k	200k
10.00 / 1.00	-0.06%	-0.07%	-0.06%	-0.05%
5.00 / 1.00	N/A	-0.05%	-0.05%	-0.04%
2.50 / 1.00	N/A	-0.04%	-0.04%	-0.03%
1.25 / 1.00	N/A	-0.04%	-0.03%	-0.03%
0.00 / 1.00	N/A	N/A	-0.03%	-0.03%



typical test results screen



EZCT-2000 Software

The EZCT-2KA comes with the Vanguard EZCT-2000 PC software. The EZCT-2000 software can be used to test a current transformer directly from a PC, create and transfer test plans, retrieve test records from the EZCT-2KA, and export test records in Excel format for further analysis.

The latest version of the EZCT-2000 software can always be downloaded free from the Vanguard web site at www.vanguard-instruments.com. Please note that you will need to create a free account on our site in order to download software or firmware.

Test Plan

Select device type test plan: EZCT-2000 EZCT-S2 EZCT-2000B

Company: Vanguard Instruments Co Inc Model: RCA 3000 SPM
 Station: Shop SN: _____
 Circuit: _____ Operator: _____
 Mr: ABB Comments: _____

Knee Point Marker:

Nameplate Ratio	Ratio Test	Excitation Test	Winding Res Test	Excitation Voltage	Excitation Current	Current Ratio Error Calculation	Test Note
X1->5: 3000 / 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	500	2	Edit	
X1->4: 2500 / 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	250	2	Edit	
X1->3: 2000 / 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	250	2	Edit	
X1->2: 1000 / 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	250	2	Edit	
X2->5: 2000 / 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	250	2	Edit	
X2->4: 1500 / 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	250	2	Edit	
X2->3: 1200 / 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	250	2	Edit	
X3->5: 800 / 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	250	2	Edit	
X3->4: 300 / 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	250	2	Edit	
X4->5: 500 / 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	250	2	Edit	

Plan Insulation Test Plan Burden Test
 50V 1.000V Test Current = 1A Test Current = 5A

Cancel Save

Application Setup

Default Print Orientation: Landscape Use USB port
 Portrait COM Port: COM1

Localization: Frequency: 60 Hz Date Format: US/MM/DD/YY

Report Logo: Browse

Image Size (1000 x 100 pixels) BMP file only

Summary Page Display: Select tag and then press up or down to change order

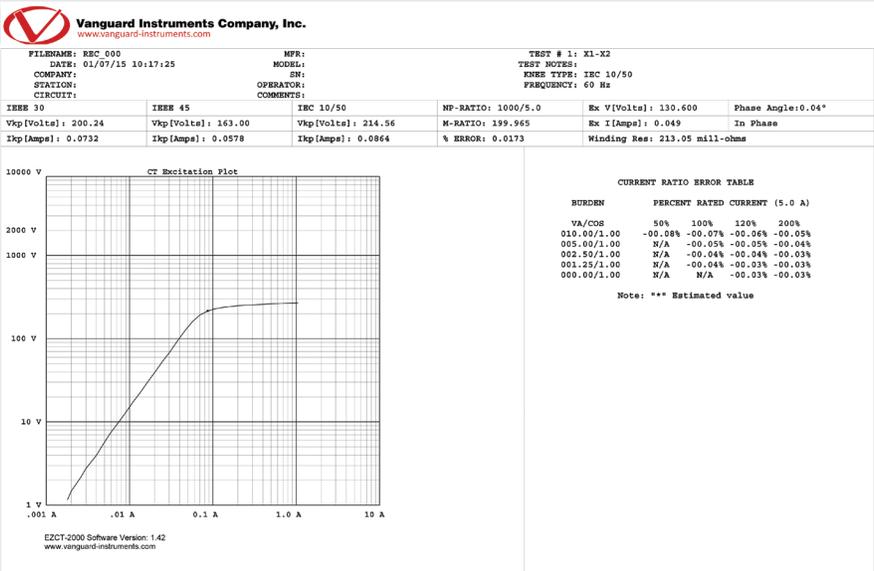
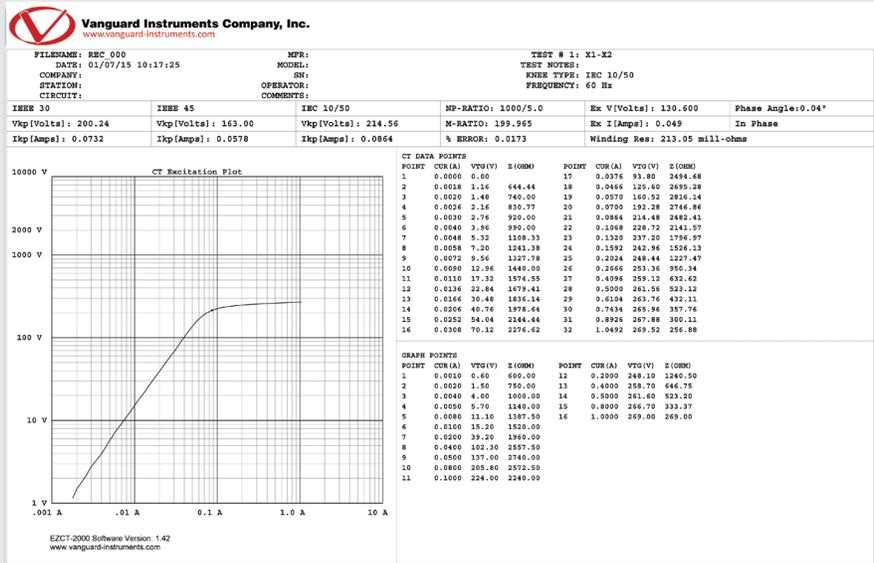
Test Record Path: Browse

Test Plan Path: Browse

Auto Export: Xcel PDF Excel

OK Cancel

desktop printer output
from EZCT-2000
software



EZCT-2000 Software (continued)

desktop printer output
from EZCT-2000
software

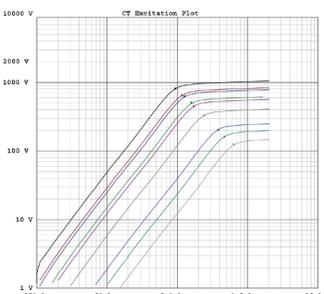


Vanguard Instruments Company, Inc.
www.vanguard-instruments.com

FILENAME: EZCT-2000C Test Record - us MFR: SUMMARY REPORT
DATE: 11/26/14 09:43:41 MODEL: EZCT-2000C KNEE TYPE: IEEE 30 Deg
COMPANY: VANGUARD SN: FREQUENCY: 60 Hz
STATION: LAB OPERATOR: AN
CIRCUIT: COMMENTS: EZCT-2000C

Test	Tap	IEEE30 (V/I)	IEEE45 (V/I)	IEC 10/50 (V/I)	NP-Ratio	M-Ratio	% Error	Phase Angle	Winding Res
1	X1-X2	161.64/0.4678	136.12/0.3802	168.08/0.4974	80/1.0	80.008	0.009 %	-0.02° [In Ø]	127.13 m-ohms
2	X1-X3	507.04/0.1580	416.92/0.1280	497.40/0.1630	240/1.0	239.868	0.055 %	0.06° [In Ø]	354.07 m-ohms
3	X1-X4	630.16/0.1266	513.84/0.1008	624.20/0.1306	300/1.0	299.827	0.058 %	0.02° [In Ø]	441.99 m-ohms
4	X1-X5	812.28/0.0938	673.28/0.0752	832.84/0.0968	400/1.0	399.874	0.031 %	0.02° [In Ø]	586.78 m-ohms
5	X2-X3	328.92/0.2420	280.20/0.1966	331.92/0.2456	160/1.0	159.890	0.069 %	-0.08° [In Ø]	239.45 m-ohms
6	X2-X4	447.60/0.1718	371.88/0.1378	464.92/0.1806	220/1.0	219.912	0.040 %	-0.12° [In Ø]	327.38 m-ohms
7	X2-X5	651.04/0.1168	540.36/0.0940	669.84/0.1240	320/1.0	319.794	0.064 %	0.10° [In Ø]	472.07 m-ohms
8	X3-X4	125.16/0.6344	101.12/0.5028	126.16/0.6732	60/1.0	60.021	0.035 %	0.04° [In Ø]	94.00 m-ohms
9	X3-X5	329.56/0.2416	282.44/0.1946	329.32/0.2412	160/1.0	159.928	0.045 %	0.00° [In Ø]	238.95 m-ohms
10	X4-X5	203.60/0.3836	169.28/0.3040	210.84/0.4032	100/1.0	100.007	0.007 %	-0.06° [In Ø]	152.50 m-ohms

Test Notepad



EZCT-2KA technical specifications

 physical specifications	Dimensions: 17"W x 12½"H x 12" D (42.7 cm x 32 cm x 26.9 cm) Weight: 48 lbs. (21 Kg)	 input power	100 – 120 Vac or 200 – 240 Vac (factory pre-set), 50/60 Hz
 current ratio range	0.8 – 999: ±0.1%, 1000 – 1999: ±0.3%, 2,000 – 4,999: ±1%, 5,000 – 10,000: ±1.5%	 measuring method	IEC 60044-1, IEC 61869, ANSI/IEEE C57.13.1, and ANSI/IEEE C57.12.90
 output test voltages	0 – 50 Vac @ 10A max; 0 – 300 Vac @ 8A max; 0 – 500 Vac @ 5A max; 0 – 1,200 Vac @ 2A max; 0 – 2,000 Vac @ 1.2A max		
 resistance measurement	range: 100 μΩ to 20 Ω; resolution: 1 μΩ accuracy: 100 μΩ – 1.99 Ω (2% of reading ±10 μΩ), 2 Ω – 20 Ω (1.5% of reading ±2 mΩ)		
 voltage reading range	0 – 2,200 Vac accuracy: ±1.0% of reading, ±1 volt	 current reading range	0 – 10 A, accuracy: ±1.0% of reading, ±0.02A
 display	5" back-lit LCD screen (240 x 128 pixels) viewable in bright sunlight and low-light levels	 phase angle measurement	0 – 360 degrees accuracy: ±1.0 degree
 printer	built-in 4½" wide thermal printer	 computer interfaces	one USB port, bluetooth
 pc software	Windows®-based CT analysis software is included with purchase price	 external data storage	one USB flash drive interface port (flash drive not included)
 internal test record storage	stores 1,000 test records. Each test record may contain up to 10 sets of excitation, resistance and ratio data		
 internal test plan storage	stores 128 test plans. Each test plan can store 10 excitation test voltage and current settings	 safety	designed to meet UL 61010A-1 and CAN/CSA C22.2 No. 1010.1-92 standards
 temperature	Operating: -10°C to +50°C (+15°F to +122°F) Storage: -30°C to +70°C (-22°F to +158°F)	 humidity	90% RH @ 40°C (104°F) non-condensing
 cables	one 20-foot (6.10m) X cable sets, one 35-foot (10.69m) H cable set, power cord, USB cable, cable carrying bag	 altitude	2,000 m (6,562 ft) to full safety specifications
 options	shipping case	 warranty	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.

Founded in 1991 and located in Ontario, California, USA, Vanguard Instruments™ offers a wide range of diagnostic test equipment that accurately and efficiently measures the health of critical substation equipment, such as transformers, circuit breakers, and protective relays.

Our first product was a computerized, extra high voltage (EHV) circuit breaker analyzer, which became the forerunner of an entire line of EHV circuit breaker test equipment. Over the years, our portfolio has grown tremendously 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 application-specific products.

Our instruments are rugged, reliable, accurate, and user friendly. They eliminate tedious and time-consuming operations, while providing fast, complex test-result calculations. Using our equipment helps reduce errors and eliminates the need to memorize long sequences of procedural steps.

In 2017, Vanguard Instruments became a part of Doble Engineering Company, an energy industry leader in hardware, software, and services that diagnose and monitor the health of critical assets.



Vanguard Instruments

A DOBLE COMPANY

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