

## MRCT

### Relay and Current Transformer Test Set

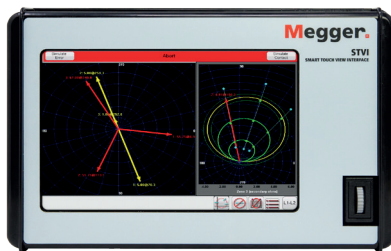


- Industry leading test duration using patented simultaneous multi-tap measurements reduces testing time by 20% on multi-tap CT's
- Accuracy to support testing of metering and protection class CT
- Integrated single phase relay test system
- Grouped testing: demagnetization, knee points, ratios, saturation curves, winding resistance insulation and more
- Measure all ratio's and saturation curves on multi-tap CT's with one lead connection
- Optional DC excitation technique for testing CTs with kneepoints up to 40 kV
- Optional Integrated VT and CT test system

#### DESCRIPTION

The Megger MRCT is a light weight, robust, portable unit used to perform demagnetization, ratio, saturation, winding resistance, polarity, phase deviation, and insulation tests on current transformers. The MRCT automatically calculates ratio errors, saturation curves, and knee points. The MRCT provides a microprocessor-controlled variable voltage and current output and precision instrumentation for automatically testing single and multi ratio CTs, reducing testing time and increasing productivity. The MRCT will directly connect to multi ratio CT's and perform all tests – saturation, ratio and polarity, winding resistance and insulation – on all taps with the push of a button and without changing leads.

The MRCT can be controlled via Megger's Smart Touch View Interface (STVI-10) controller. The STVI-10 controller is a full color, high resolution, LCD touch screen which allows the user to perform manual and automatic testing quickly and easily using the manual test screen, as well as using pre-constructed test routines. The large color display permits the user to easily read all pertinent data while the test is being performed and provides the ability to view the current transformer's saturation curve. The unit can also be configured to come without a Megger STVI-10 and can be controlled via a laptop with Megger's PowerDB software.



Current transformers can be tested in their equipment configuration, such as being mounted in transformers, oil circuit breakers or switchgear. It is necessary for the equipment to be completely isolated from the electrical system prior to testing.

#### APPLICATIONS

##### Saturation Test

With the single push of a button, the MRCT performs a CT saturation test and calculates the rated knee point. The saturation test can be performed at frequency of 50 or 60 Hz up to 2,000 volts as required by IEC regulations. In addition the MRCT can be configured to test kneepoints up to 40 kV using an alternative DC technique. This allows testing the majority of CTs using line frequency while still being able to test larger generation class CT with a portable instrument.

The MRCT will calculate the rated knee point in compliance with either IEEE C57.13.1, IEC 60044-1, IEC 60044-6 or IEC 61869 on both standards as well as of specialized CTs such as PX, TPS, TPX, and TPY. While the saturation test is being performed, the MRCT will plot the CT saturation curve on the STVI display and automatically provide the user with the rated knee point per the desired IEEE or IEC standard. Many substations CTs include a multi-ratio secondary; therefore the MRCT has the ability to plot and simultaneously display up to 10 CT saturation curves.

**Ratio, Polarity Test** – Ratio testing can be performed by using the MRCT. The method used by the MRCT compares a voltage applied to the secondary winding to the resulting voltage produced on the primary winding. For example, if 1 volt per turn is applied to the secondary winding, the voltage present on the primary winding would be 1 volt. More specifically, if 120 volts were applied to the secondary of a 600:5 current transformer (120:1 ratio), 1 volt would be present on the primary winding.

**Winding Resistance Test** – Measures CT winding resistance with the injection of a test voltage, measuring the DC current and calculating temperature compensated resistance.

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**Demagnetization** – Normal operating conditions and typical winding resistance measurements can cause a CT to become magnetized. The MRCT has the ability to automatically demagnetize the CT under test. This automatic demagnetization routine is useful to ensure that the CT saturation test yield correct results. Prior to testing demagnetization is recommended per both ANSI and IEC standards.

**CT Burden** – The MRCT measures the connected CT burden load with direct injection of secondary current to a load that is disconnected from the CT. The MRCT measures the secondary voltage in magnitude and angle of the connected burden in VA and power factor.

**Insulation Resistance Test** – In order to ensure that the CT secondary wiring is properly insulated, the MRCT system includes a 500 V, 1,000 V insulation resistance test system. This test ensures that the CT secondary winding and secondary wiring is properly insulated per both ANSI and IEC standards. The MRCT will also automatically switch the test leads to perform all required insulation test. These test include H-L, H-G, L-G.

**Note:** *Disconnect all electronic loads before performing this test.*

**Data Storage and Printing** – The MRCT test system not only permits accurate and automated CT testing, but also catalogs and stores test results within the STVI for simple retrieval by software at a later date. All cataloged test results can be uploaded to Megger's PowerDBTM Lite for report generation and saturation curve plotting on a computer or STVI. PowerDB Lite also has the ability to operate the MRCT with no operator intervention, thus providing a completely computer controlled automated test system.

**Upgradeability** – The MRCT includes the ability to upgrade testing capability. With various configurations and accessories the MRCT system can be upgraded as new testing needs are developed.

### FEATURES AND BENEFITS

■ **Industry leading test duration using patented simultaneous multi tap measurements** - The MRCT system can provide concurrent measurement of voltages on all taps during CT saturation, and ratio and polarity testing. This allows the MRCT system to calculate the knee points and ratios of all windings at the same time thus eliminating the need for multiple tests on a CT. This will drastically reduce testing time.

- **Automated Test Plans with CT Saturation, Ratio and Polarity, Winding Resistance and Insulation Testing** - The microprocessor controlled output fully automates testing of CTs. The MRCT will directly connect to multi ratio CTs and perform all tests – saturation, ratio and polarity, winding resistance, and insulation – on all taps with the push of a button and without changing leads.
- **Direct Connection to Multi Ratio CTs** - The MRCT will directly connect to all taps on multi ratio CTs to eliminate lead changes required to test all inner-winding CT ratios, saturation curves and knee points. The MRCT will test all programmed taps with the push of one button.
- **Full Color, High Resolution, LCD Touch Screen** - Menu screens and touch screen function buttons are provided to quickly and easily select the desired test function. Tests results can be saved to the unit for download to a memory stick to transfer or print test reports.
- **CT Saturation, Ratio and Polarity, Winding Resistance, and Insulation Automated Testing** - The microprocessor-controlled output fully automates testing of CTs. This automated testing simplifies CT testing and reduces testing time. Automated testing is accomplished directly on the Megger's STVI or via PowerDB Lite.
- **CT Demagnetization** - During operation and routine DC winding resistance testing, it is possible for a CT to become magnetized. The MRCT includes an automated CT demagnetization function, which allows determination of accurate knee point and ratios thus providing stable, repeatable test results, and reduces test time.
- **Insulation Test** - The MRCT includes a 500/1,000 V insulation test system to verify the CT secondary winding and secondary wiring. This insures that the secondary insulation has not degraded and will continue to perform its function during high current faults.
- **Test Result Report** - The MRCT offers storage of complete test files in an easy-to-use, versatile format that permits upload to PowerDB Lite, or printing test results using the optional external printer. These options provide a simple, complete, easy way to store over 200 test results and saturation curves. All test results can be cataloged and stored in the MRCT.



*The MRCT is available in 2 onboard display/enclosure options.*

## MRCT

# Relay and Current Transformer Test Set

### SPECIFICATIONS

#### Input

100 to 132 V or 200 to 264 V, 1 $\phi$ , 50 or 60 Hz, 15 A max

#### Output

**Voltage – Continuously variable in three ranges:**

0 to 30 V at 5.0 A max (15 minute on, 5 minute off)

0 to 300 V at 1.0 A max (15 minute on, 5 minute off)

300 to 2000 V at 1.0 A max (5 minute on, 5 minute off)

#### Current

**Output Current:** Power Max V/Duty Cycle

**30 Amperes:** 200 VA (282 peak) 6.67 V rms  
(15 minutes on, 5 minutes off)

**60 Amperes:** 600 VA 90 cycles

#### Instrumentation

##### Voltmeters

##### Output

**Resolution:** 0.0000 to 1.9999/19.999/199.99/1999.9

**Ranges:** 0 to 2/20/200/2000 V

**Accuracy:**  $\pm 0.5\%$  of reading typical

$\pm 1.0\%$  of reading typical max

##### Input

##### Primary Voltage Measurement

**Ranges:** 0 to 0.35/2.0/20.0/200.0/600.0 V

**Resolution:** 0.0001 to 1.9999/19.999/199.9/600 V

**Accuracy:**  $\pm 0.02\%$  of reading and  $\pm 0.02\%$  range typical  
 $\pm 0.05\%$  of reading and  $\pm 0.05\%$  range max

##### Secondary Voltage Measurement

**Ranges:** 0 to 2/20.0/200.0/2000.0 V

**Resolution:** 0.0000 to 19.999/199.9/1999.9 V

**Accuracy:** **0 to 999.9 V**

$\pm 0.02\%$  of reading and  $\pm 0.02\%$  range typical  
 $\pm 0.05\%$  of reading and  $\pm 0.05\%$  range max

**1000 to 2000 V**

$\pm 0.08\%$  of reading and  $\pm 0.08\%$  range typical  
 $\pm 0.2\%$  of reading and  $\pm 0.2\%$  range max

#### Ammeter

##### Output:

**Ranges:** 0.0 to 1.0/10.0/60.0 A

**Resolution:** .001/.01

##### Input:

##### Excitation curve testing

**Range:** 0.0000 to 1.0 A

**Accuracy:**  $\pm 0.08\%$  of reading  $\pm 0.08\%$  range typical  
 $\pm 0.2\%$  of reading  $\pm 0.2\%$  range max

#### Phase Angle Measurement

##### 3 digits

**Range:** 0 to 360 degrees

**Resolution:** 1 minute

**Accuracy:**  $\pm 3$  minutes typical  
 $\pm 6$  minutes max

#### Ratio Test

##### Secondary Voltage Injection Method

Range	Accuracy
0.8 to 2000	$\pm 0.02\%$ typical $\pm 0.05\%$ max
2000 to 5000	$\pm 0.03\%$ typical $\pm 0.1\%$ max
5000 to 20000	$\pm 0.05\%$ typical $\pm 0.2\%$ max

#### Winding Resistance Test

**Measuring Range:** 0–300  $\Omega$

**Accuracy:** (at 20° C) 0.5%  $\pm 3$  m $\Omega$  (typical)/  
1%  $\pm 10$  m $\Omega$  (guaranteed) (0 – 300  $\Omega$ )

#### Insulation Test

**Test Voltage:** 1000 VDC, 500 VDC

**Measuring Range:** 20 G $\Omega$ , 10 G $\Omega$

**Short Circuit Current:** 1.5 mA nominal

**Test Current on Load:** 1 mA at min. pass values of insulation  
(as specified in BS7671, HD 384 and IEC 364)

**Accuracy:** 1000 volts  $\pm 3\%$   $\pm 2$  digits  $\pm 0.2\%$  per G $\Omega$   
500 volts  $\pm 3\%$   $\pm 2$  digits  $\pm 0.4\%$  per G $\Omega$

#### Communication Interface

Ethernet

#### Environment

**Humidity:** Relative humidity 5%...95% not condensing

**Operating:** -10° C to 50° C

**Storage:** -30° C to 70° C

**Enclosure:** The unit is housed in a rugged enclosure suitable for use in outdoor substations.

#### Standards

IEC 61010, CSA 22.2, CE

#### Input Power

100 to 240 V ( $\pm 10\%$ ) AC, 50/60 Hz

#### Dimensions

16.9 L x 12.9 W x 9.3 H in (429 mm x 328 mm x 236 mm)

#### Weight

**Non Display:** 41 lb (18.6 kg)

**w/ Display:** 45.4 lb (20.6 kg)

#### CE Marking

Low voltage directive: 2006/95/EC

Electromagnetic Compatibility Directive: 2004/108/EC

#### Conformance Standards

##### Safety

EN 61010-1 2010

EN 61010-2-030 2010

EN 61010-031 2002

EN 61010 +A1

##### EMC

EN 61326-1 2006

EN 61326-2-1 2006

# MRCT

## Relay and Current Transformer Test Set

### DESCRIPTIONS OF HARDWARE OPTIONS AND ACCESSORIES

#### CURRENT TRANSFORMER TESTING (CT) USING DC VOLTAGE OPTION

##### DESCRIPTION

The MRCT can be configured to include the functionality to perform the excitation test on current transformers using DC voltage. With this configuration the MRCT can measure knee points on current transformers up to 40 kV. When the MRCT is configured to test in AC mode, the unit will perform the saturation test using AC voltage up to 2 kV. If the CT requires additional voltage above 2 kV to saturate, the MRCT will switch to DC voltage and complete the saturation of the CT. The MRCT will then convert the DC data to its AC equivalent and combine both sets of data into one excitation curve representing of the CT. On the other hand, if the MRCT is set to perform the excitation/saturation test using primarily DC voltage, then the MRCT will apply AC voltage up to 300V and then switch to DC voltage to finish saturating the CT. Again this data set will be combined and converted to line frequency either 50/60 Hz and a representative excitation curve created.

##### APPLICATIONS

As part of a regular maintenance program to verify factory readings and locate the presence of defects in current transformers, the MRCT can accurately perform the excitation test on CTs and measure the knee point up to 2 kV using AC voltage. For CTs that have a knee point higher than 2 kV the MRCT can be configured to utilize DC voltage to saturate the CT and accurately measure the knee point up to 40 kV.

#### DC VOLTAGE TESTING OPTION SPECIFICATIONS

CT Testing Using	Outputs
DC Voltage	Output Voltage 0 to 300 V DC
	Output Current 0 to 1 A eff
	Output Power 300 VA

#### RELAY OPTION SPECIFICATIONS

##### Outputs

All outputs are independent from sudden changes in line voltage and frequency. This provides stable outputs not affected by sudden changes in the power source. All outputs are regulated so changes in load impedance do not affect the output.

##### Output Current

Output power ratings are specified in AC rms values and peak power ratings.

Output Current Power Max V / Duty Cycle	
	1 ampere 15 VA 15.0 V rms continuous
	4 amperes 200 VA (282 peak)
	50.0 V rms continuous
	15 amperes 200 VA (282 peak)
	13.4 V rms continuous
	30 amperes 200 VA (282 peak)
	6.67 V rms continuous
	75 amperes 300 VA (424 peak)
	5.00 V rms 90 cycles
	<b>DC 200 Watts</b>

#### AC Voltage Output

Outputs are rated with the following Ranges:

Output volts power max I
30 volts 150 VA 5 amps
150 volts 150 VA (see Power V)
300 volts 150 VA 0.5 amps
DC 150 watts

**Duty Cycle:** Continuous

#### Metering

Measured output quantities such as AC amperes, AC Volts, DC volts or DC amperes, and time may be simultaneously displayed on the large, color TFT LCD, optional STVI touch screen. The AC and DC outputs display the approximate voltage/current output prior to initiation of the outputs.

#### AC Voltage Amplitude

**Accuracy:** ±0.05% reading + 0.02% range typical  
±0.15% reading + 0.05% range max

**Resolution:** .01

**Measurements:** AC RMS

**Ranges:** 30, 150, 300V

#### AC Current Amplitude

**Accuracy:** ±0.05% reading + 0.02% range typical  
±0.15% reading + 0.05% range max

**Resolution:** .001/.01

**Measurements:** AC RMS

**Ranges:** 30, 60A

#### DC Voltage Amplitude

**Accuracy:** 0.1% range typical, 0.25% range max

**Resolution:** 01

**Measurements:** RMS

**Ranges:** 30, 150, 300V

#### DC Current Amplitude

**Accuracy:** ±0.05 % reading + 0.02 % range typical,  
±0.15 % reading + 0.05 % range max

**Resolution:** .001/.01

**Measurements:** RMS

**Ranges:** 30A

# MRCT

## Relay and Current Transformer Test Set

### DESCRIPTIONS OF HARDWARE OPTIONS AND ACCESSORIES

#### VOLTAGE TRANSFORMER (VT) TESTING OPTION

##### DESCRIPTION

The MRCT can be configured to include the functionality to test voltage transformers. With the basic configuration the MRCT can measure ratio errors and phase angles as well as the secondary winding resistance. If more information is needed the MRCT can be configured with the advanced testing option that will additionally determine the excitation characteristics, and the impedance of inductive voltage transformers. Additionally, with an output of up to 2 kV the MRCT can be configured for basic or advanced testing of low to medium voltage capacitive coupled voltage transformers up to 800 kV.

##### APPLICATIONS

As part of a regular maintenance program to verify factory readings and locate the presence of defects in voltage transformers, the MRCT can accurately measure the ratio, phase displacement, secondary winding resistance, excitation characteristics, and impedance. The MRCT utilizes up to 300V to accurately measure the ratio and phase angle of inductive voltage transformers. Also with the additional CVT configuration the MRCT has the capability to supply over 2000V to measure the ratio of low to medium voltage capacitive voltage transformers up to 800 kV.

#### VT and CT OPTION SPECIFICATIONS

##### Inductive VT Testing

###### Outputs

Output Voltage	0 to 300 V AC
Output Current	0 to 1 A eff
Output Power	300VA

###### Ratio Measurement

Voltage ratio	Voltage Level	Accuracy
1 to 350	0.6 kV to 35 kV	±0.03% typical ±0.1%max
350 to 1100	35 kV to 110 kV	±0.05% typical ±0.2%max
1100 to 2450	110 kV to 245 kV	±0.05% typical ±0.5%max

###### Phase Angle Measurement

Voltage ratio	Voltage Level	Accuracy
1 to 350	0.6 kV to 35 kV	±3 min typical ±6 min max
350 to 1100	35 kV to 110 kV	±3 min typical ±10 min max
1100 to 2450	110 kV to 245 kV	±3 min typical ±15 min max

###### Winding resistance measurement

<b>Resolution:</b>	1m Ω
<b>Range:</b>	1m Ω to 30 Ω
<b>Guaranteed Accuracy:</b>	(at 20° C) ±0.5% + 10m Ω

##### Capacitive VT Testing

###### Outputs

Output Voltage	0 to 2050 V AC
Output Current	0 to 1 A
Output Power	2000 VA

###### Ratio Measurement

Voltage ratio	Voltage Level	Accuracy
300 to 8000	>30 kV to 800 kV	±0.07% typical ±0.15%max

###### Phase Angle Measurement

Voltage ratio	Voltage Level	Accuracy
300 to 8000	>30 kV to 800 kV	±6 min typical ±15 min max

###### Winding resistance measurement

<b>Resolution:</b>	1m Ω
<b>Range:</b>	1m Ω to 300 Ω
<b>Guaranteed Accuracy:</b>	(at 20° C) ±0.5% + 10m,Ω



## MRCT

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### DESCRIPTIONS OF HARDWARE OPTIONS

#### Testing method

Customers can choose which method the MRCT will use to perform the excitation test. By selecting **S** the customer will be selecting the standard method of performing the excitation/saturation test. The MRCT will be configured to use AC test voltage up to 2 kV to perform the test. By selecting **D** the customer will receive both the standard method of testing described above as well as Megger's new DC excitation technique. With its new DC method the MRCT will be able to test kneepoints up to 40 kV.

#### Voltage transformer testing

Customers can choose which type of Voltage Transformer testing functionality they want the MRCT unit to have enabled. Customers should select letter **0** if they wish for the MRCT to not be configured for testing any type of voltage transformer. **1** should be selected if the customer wishes for the MRCT to be configured for performing basic tests on inductive voltage transformers. These basic tests include ratio and phase angle error accompanied with secondary winding resistance. The customer should select **2** if they desire the MRCT to be configured to perform the basic tests on both Inductive VTs and Capacitive VTs. The MRCT can also be configured to perform additional advanced tests on voltage transformers. In addition to the ratio, phase angle error, and winding resistance, the advanced option enables performing the excitation test, short circuit impedance, and insulation test. The customer should select the number **3** if the desired MRCT should be configured for Advanced testing of Inductive VTs,. By selecting the number **4**, the MRCT will be configured for advanced testing of both Inductive VTs and Capacitive VTs.

#### Multifunction testing option

Customers can select whether or not the MRCT has the capability to test single phase relays. If they want the unit to only test CT, customers should select the letter **C**, but if they wish for the MRCT to be configured to test both CT and single phase relays then the letter **R** should be selected.

#### IEC 61850 option

If the MRCT is configured to test relays, Megger GOOSE Configurator software may be used in the testing or commissioning of IEC 61850 compliant devices. In order for the MRCT to be able to subscribe as well as publish GOOSE messages, the MRCT must be configured to test relays and the IEC 61850 feature needs to be enabled. Enter the number **1** for the unit to come with the IEC 61850 option enabled. Enter **0** for the unit without IEC 61850 enabled.

#### Integrated insulation test

Enter **R** for the unit to come with an integrated insulation resistance test capability. Enter **N** for the unit without an integrated insulation test.

#### Test leads option

Enter the letter **N** for the unit without test leads. Enter the letter **S** for the unit to come with set of standard test leads. Enter the letter **K** for the unit to come with Kelvin test leads. Enter the letter **L** for the unit to be supplied with both secondary (X) and primary (H) test leads that are longer than the standard secondary and primary test leads.

#### Bluetooth option

For customers who wish to have a wireless control of the MRCT unit, enter the number **1** for the unit to come with the Bluetooth option installed. Enter **0** for without.

#### Power cord option

Customers can choose which type of power cord they want the unit to come with.

**A option** – NEMA 5-15 to IEC60310 C13 connectors, UL & CSA approved for countries with NEMA outlets.

**I option** – International color coded wires (light blue, brown and green with yellow stripe) insulation jacket stripped ready for male connector with IEC 60320 C13 connector. CE marked.

**E option** – CEE 7/7 Schuko plug to IEC 60320 C13 connector. CE marked.

**U option** – United Kingdom power cord with IEC 60320 C13 connector, and 13 amp fuse. CE marked.

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### TEST LEADS AND ACCESSORIES

All units come with a power cord, an Ethernet communication cable, and instruction manual. All other accessories varies depending on the features selected, see Table of Accessories.

Included standard accessories	Part number	620000
Power Cord - Depending on the style number, the unit will come with one of the following:		
Line cord, North American	620000	
Line cord, Continental Europe with CEE 7/7 Schuko Plug	50425	
Line cord, International colour-coded wire	15065	
Line cord, United Kingdom	90002-989	
Ethernet cable for interconnection to PC, 210cm (7 ft.) long (Qty. 1 ea)	90003-594	
Instruction manual	81757	




### TABLE OF ACCESSORIES



Accessories are supplied with the selection of the various features depending upon the option selected. Test Leads and Accessories can also be ordered individually, see below for accessories included with option and part numbers.




Standard Option	Descriptions of standard option test leads and accessories	Quantity	Part number
	<b>Accessory carry case:</b> Used to carry power cord, ethernet cable, optional STVI, test leads and accessories.	1	2003-725
	<b>Set of primary test leads:</b> Test Leads 40 ft (12.1 m)	1	1005-466
	<b>Set of secondary test leads:</b> 5 Tap ( X1, X2, X3, X4, X5) Test Leads 20 ft (6.096 m)	1	1005-774
	<b>Ground lead:</b> Green with yellow, with large ground clip 20 ft	1	2003-724
	<b>Alligator clip:</b> Black, 4.1 mm	5	90004-427
	<b>Cable/spade lug adapter (small):</b> Small lug fit most new relay small terminal blocks. Lug adapter, <b>red</b> , 4.1 mm, rated up to 1000 V/20 A CAT II	5	684004
	<b>Cable/spade lug adapter (small):</b> Small lug fit most new relay small terminal blocks. Lug adapter, <b>black</b> , 4.1 mm, rated up to 1000 V/20 A CAT II	5	684005
	<b>USB memory stick</b>	1	83726
	<b>Primary test clip: Red</b> 40 mm opening	1	1011-781
	<b>Primary test clip: Black</b> 40 mm opening	1	1011-782

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Kelvin Option	Descriptions of accessories included with kelvin option	Quantity	Part number
	<b>Kelvin test leads:</b> Substituted for standard secondary test lead 1005-774 <b>Black, 20 ft</b>	1	1004-424
	Clips <b>Red</b>	1	2005-478
	Clips <b>Black</b>	1	2005-477


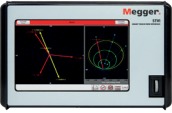
Long Option	Descriptions of accessories included with long option	Quantity	Part number
	<b>Set of primary test leads:</b> Substituted for standard 40 ft primary test lead 1005-466 <b>Black, 60 ft (18.28 m)</b>	1	1008-680
	<b>Set of secondary test leads (1 each):</b> Substituted for standard 20 ft secondary test lead 1005-774 <b>Black, 30 ft (9.14 m)</b>	1	1008-780

Relay Option	Descriptions of accessories included with relay option	Quantity	Part number
	<b>Sleeved pair of test leads:</b> Keeps the test leads in pairs and from getting entangled. Sleeved Test Leads, one <b>red</b> , one <b>black</b> , 200 cm (78.7") long, 600 V, 32 Amperes CAT II	1	2001-394
	<b>Cable/spade lug adapter (small):</b> Small lug fit most new relay small terminal blocks. Lug adapter, <b>red</b> , 4.1 mm, rated up to 1000 V/20 A CAT II	5	684004
	<b>Jumper lead:</b> Used to common returns together on units with floating ground returns, or parallel of current channels. Jumper lead, <b>black</b> , 12.5 cm (5") long, use with voltage / current outputs, 600 V, 32 Amps CAT II	4	2001-573

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### OPTIONAL ACCESSORIES

	Descriptions of optional accessories	Quantity	Part number
	<p><b>Hard-sided transit case:</b> Includes custom designed foam inserts for the MRCT unit and accessory case. Transit case includes retractable handle, polyurethane wheels with stainless steel bearings, double-throw latches, fold down handles, and stainless steel hardware and padlock protection, with O-ring seal making the case water-tight, with an IP 67 rating. Tested and certified to US Department of Defense Standards for impact, vibration, and low/high storage temperatures. The case is small, and weighs only 25 pounds (11.25 kg).</p>	1	1016-063
	<p><b>Smart Touch View Interface:</b> The Smart Touch View Interface™ (STVI-10) is Megger's handheld controller for the MRCT, the SMRT and the older MPRT relay test systems. The STVI, with its large, full color, new high resolution, and high definition TFT LCD touch screen allows the user to easily control the MRCT using built in MRCT test screens, as well manual routines for current transformers. Ergonomically designed for either right or left hand operation using the rubber cushion grips, the centrally located control knob, and the touch screen, the STVI is extremely easy to use. Use the new built-in stand for single-handed operation. The STVI uses a standard Ethernet cable, and Power Over Ethernet (POE) operation. The STVI includes non-volatile built-in data storage for saving tests and test results. A USB port is provided for transferring test results to your PC.</p>	1	STVI-10

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