



TISSUE RESPONSE LOAD



TRL-2420

USER MANUAL

**BC BIOMEDICAL
TRL-2420
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WARNING - USERS

The TRL-2420 is for use by skilled technical personnel only.

WARNING - USE

The TRL-2420 is intended for testing only and should never be used in diagnostics, treatment or any other capacity where they would come in contact with a patient.

WARNING - MODIFICATIONS

The TRL-2420 is intended for use within the published specifications. Any application beyond these specifications or any unauthorized user modifications may result in hazards or improper operation.

WARNING - CONNECTIONS

All connections to patients must be removed before connecting the DUT to the TRL-2420. A serious hazard may occur if the patient is connected when testing with the TRL-2420. Do not connect any leads from the patient directly to the TRL-2420 or DUT.

WARNING - LIQUIDS

Do not submerge or spill liquids on the TRL-2420. Do not operate the unit may have been exposed to fluid.

CAUTION - OPERATION

Do not change power selection switch while the DUT RF output is active.

CAUTION - OPERATION

The TRL-2420 is not designed for continuous operation. Maximum ON time is 25 seconds.

Allow at least 10 seconds between tests.

Do NOT use the TRL-2420 with continuous generator outputs such as Cut, Coag, or Bipolar.

CAUTION - ENVIRONMENT

Exposure to environmental conditions outside the specifications can adversely affect the performance and accuracy of the DPM-2350. If the unit is outside the Operating Specifications, allow it to acclimate to specified conditions for at least 30 minutes before attempting to operate it.

CAUTION - SERVICE

The TRL-2420 is intended to be serviced only by authorized service personnel.

Troubleshooting and service procedures should only be performed by qualified technical personnel.

CAUTION - CLEANING

Do not immerse. The TRL-2420 should be cleaned by wiping gently with a damp, lint-free cloth. A mild detergent can be used if desired.

CAUTION - INSPECTION

The TRL-2420 should be inspected before each use for wear and should be serviced if any parts are in question.

NOTICE – SYMBOLS

Symbol

Description



Caution

(Consult Manual for Further Information)



Per European Council Directive
2002/95/EC, do not dispose of this
product as unsorted municipal waste.

NOTICE – ABBREVIATIONS

C	Celsius
°	degree(s)
DUT	Device Under Test
ESU	Electrosurgical Unit
F	Fahrenheit
kg	kilogram(s)
mA	milliampere(s)
lbs	pounds
RF	Radio Frequency

NOTICE – DISCLAIMER

BC GROUP INTERNATIONAL, INC. WILL NOT BE RESPONSIBLE FOR ANY INJURIES SUSTAINED DUE TO UNAUTHORIZED EQUIPMENT MODIFICATIONS OR APPLICATION OF EQUIPMENT OUTSIDE OF THE PUBLISHED INTENDED USE AND SPECIFICATIONS.

NOTICE – DISCLAIMER

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NOTICE – CONTACT INFORMATION

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**BC BIOMEDICAL
TRL-2420
TISSUE RESPONSE LOAD ACCESSORY**

The TRL-2420 is an accessory to the BC Biomedical ESU-2400 that is used to simulate the effect of changing tissue impedance during electrosurgery. The TRL-2420 contains two incandescent bulbs that are silicone coated for safety. As RF energy from the ESU generator (DUT) is applied to the bulbs, the impedance of the bulb changes, simulating the impedance change of tissue.

Some RF generators have special output modes that detect the change of tissue impedance and automatically turn off the RF output when the change in impedance is detected. The ESU-2400 measures the current at the time when the RF output is turned off.

CAUTION - OPERATION

The TRL-2420 is not designed for continuous operation. Maximum ON time is 25 seconds.

Allow at least 10 seconds between tests.

Do NOT use the TRL-2420 with continuous generator outputs such as Cut, Coag, or Bipolar.

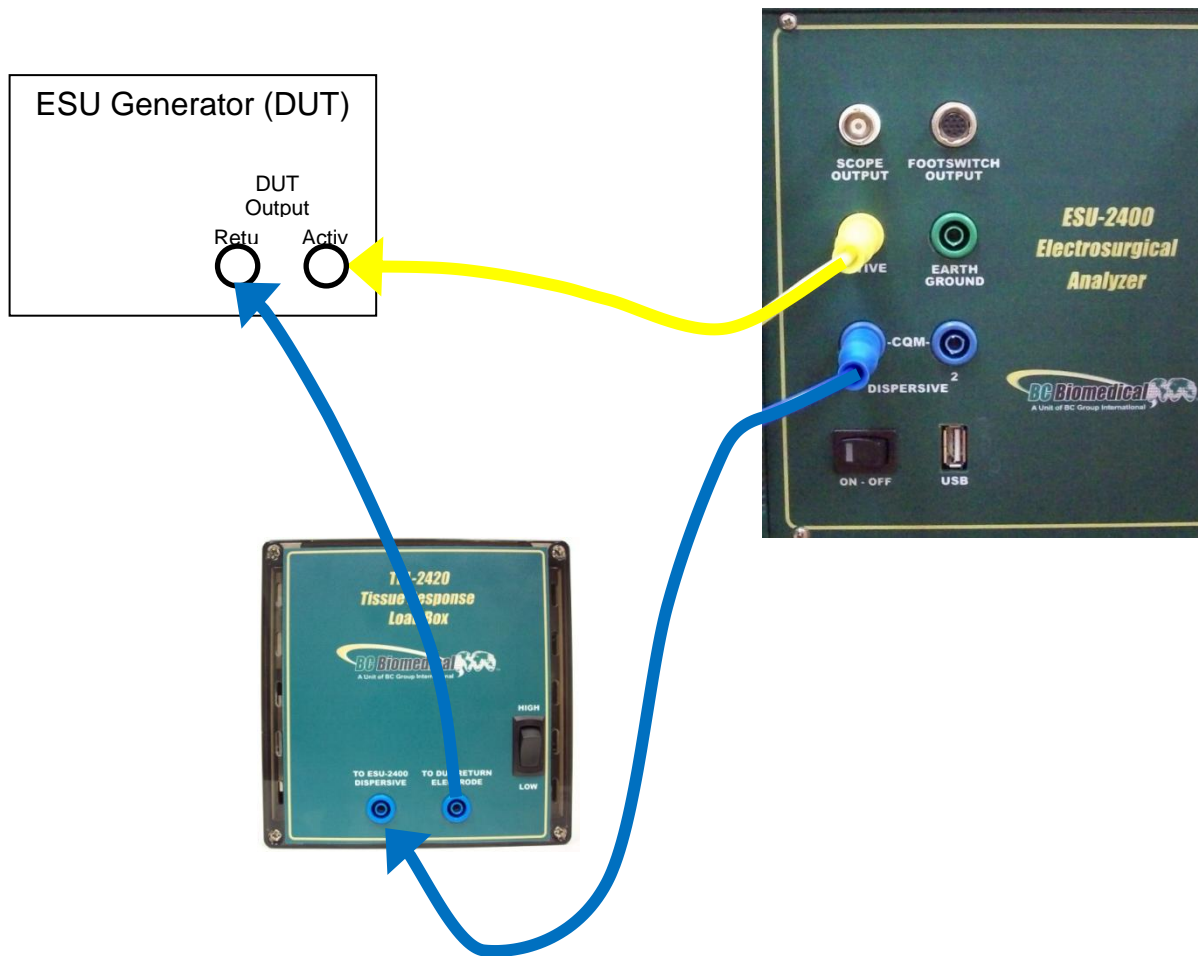
LAYOUT

This section looks at the layout of the TRL-2420 and gives descriptions of the elements that are present.

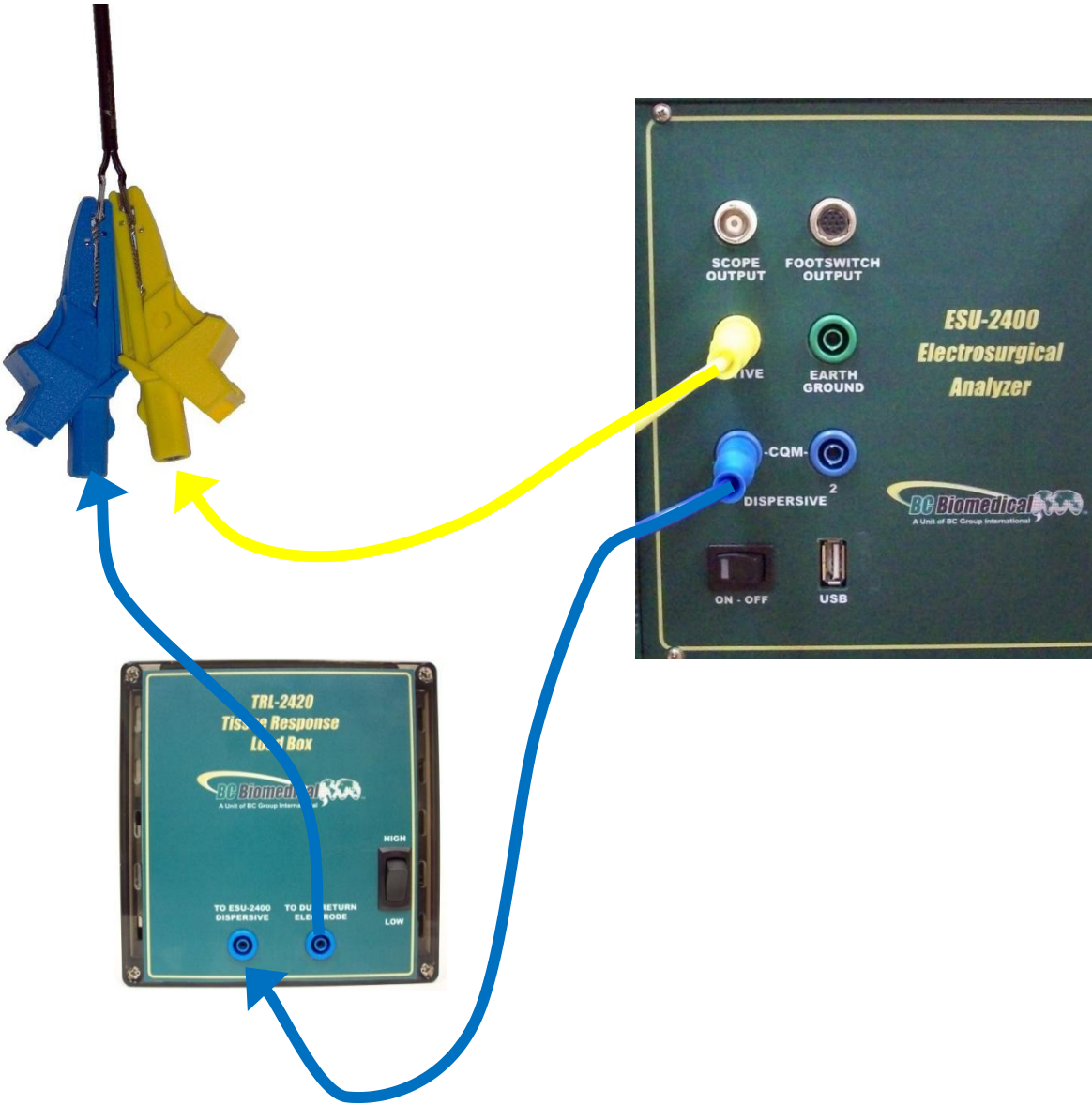


TEST SETUP

The TRL-2420 is connected in series with the return electrode of the ESU generator (DUT) as shown in the connection diagram below. The DUT Return terminal shown below is typically not the Patient Return electrode. The terminals are labeled Return and Active for reference only. Refer to the DUT service manual to determine which DUT ports are used for the tissue response output.

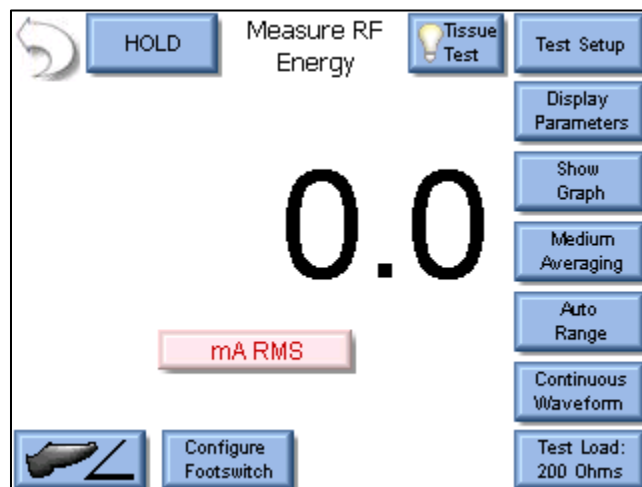



If the output terminals of the DUT are not compatible with the standard ESU-2400 safety test leads, the alligator clips supplied with the ESU-2400 accessory kit can be used to connect directly to the electro-surgical instrument as shown in the connection diagram below.

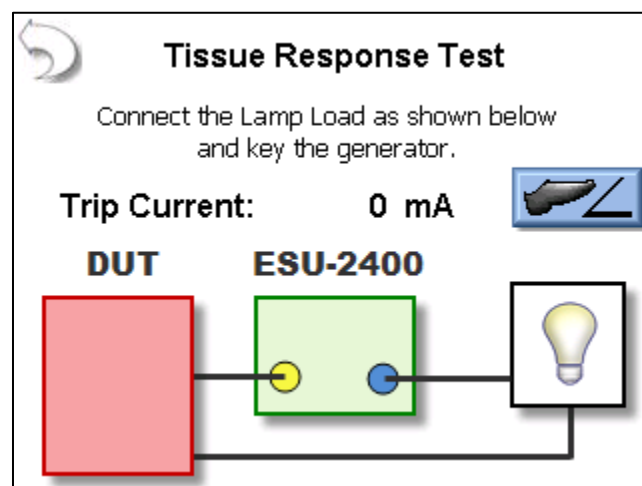


OPERATION

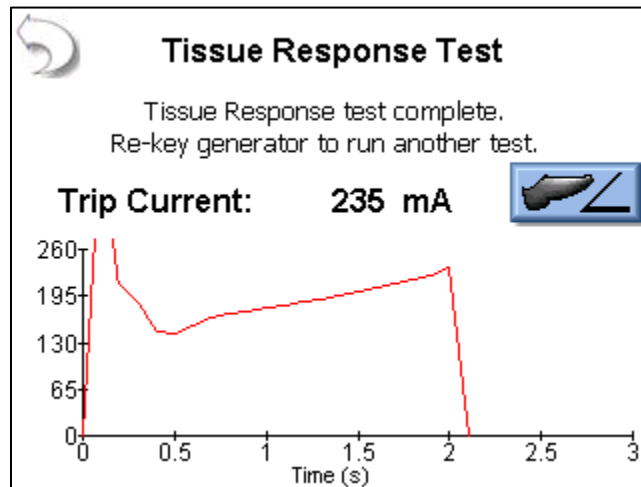
From the ESU-2400 main menu, select Measure RF Energy. This will display the RF Measurement screen as shown below.



Press the  button in the top right corner of the screen. This will display the Tissue Response test screen shown below:



With the TRL-2420 connected as the Lamp Load shown in the screen and in the Test Setup section, activate the output of the DUT. The DUT should detect the change in impedance of the TRL-2420 and automatically turn off the output. At this point, the ESU-2400 display will change to a graph of the measured current and the current measured just before the DUT output was turned off.



The test can be repeated by re-activating the DUT. At the end of the test the ESU-2400 display will automatically refresh with the new measurements.

The switch on the front of the TRL-2420 can be used to select a high or low power mode. This will select one or two bulbs as the load for the generator.

CAUTION - OPERATION

Do not change power selection switch while the DUT RF output is active.

The footswitch button on the ESU-2400 screen can be used to trigger the DUT by activating the footswitch output 4 of the footswitch connector. Refer to the Footswitch Output section of the ESU-2400 User Manual for more details.

MANUAL REVISIONS

<u>Revision #</u>	<u>Revisions Made</u>
Rev 01	Origination
Rev 02	Format Updated

LIMITED WARRANTY

WARRANTY: BC GROUP INTERNATIONAL, INC. WARRANTS ITS NEW PRODUCTS TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER THE SERVICE FOR WHICH THEY ARE INTENDED. THIS WARRANTY IS EFFECTIVE FOR TWELVE MONTHS FROM THE DATE OF SHIPMENT.

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BC GROUP INTERNATIONAL, INC. IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

NO PERSON OTHER THAN AN OFFICER IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR ASSUME ANY LIABILITY.

SPECIFICATIONS

GENERAL	
LOW POWER MODE	40 Watts
HIGH POWER MODE	80 Watts
DUTY CYCLE	Maximum 25 Seconds On Minimum 10 Seconds Off
LAMP TYPE	Special-Purpose Incandescent Light Bulb 40 Watt, 120V, A15, Medium Base, Silicon Coated
LAMP REPLACEMENT PART NUMBER	BC80-00695

PHYSICAL	
CONSTRUCTION	ABS Plastic
SIZE	6.5 x 6.5 x 4.0 Inches (165.1 x 165.1 x 101.6 mm)
WEIGHT	< 2 Lbs (0.91 Kg)
OPERATING RANGE	15 to 30 °C (59 to 86 °F)
STORAGE RANGE	0 to 60 °C (-32 to 140 °F)

NOTES

NOTES



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