



CR-600 Chattering Relay Accessory

The AE Techron **CR 600 Chattering Relay** is a cost-effective, rugged yet elegant solution to the DO 160 Section 19.3.5 “Spikes Induced into Interconnecting Cables” test requirement.

Internally built around a 50A high-current relay with two independent sets of contacts, the CR 600 was engineered for double the life before refurbishment.

The CR 600 uses quick-connect, touch-proof connectors to ensure efficient setup and a safe test environment. It also includes quick-clip test points for oscilloscope monitoring of tests in progress.

When driven from an intermittent voltage source like the AE Techron DSR 100-25 and utilizing test waveform, “Section 19.3.5 CR 600”, the CR 600 output meets the voltage (600V), duration (50 – 1000 μ s) and repetition-period (0.2 to 10 μ s) requirements specified by the DO-160 standard.

Application

The AE Techron CR-600 accessory was designed for use with AE Techron amplifiers to perform the Spikes Induced into Interconnecting Cables test as part of aviation test standards like RTCA DO160 Section 19.3.5.

Unit Setup

Safety First

Throughout these instructions, special emphasis is placed on good safety practices. The LIGHTNING FLASH

For testing to these Specifications:

- DO 160 Section 19.3.5

Features

- Coil Voltage: 24 VDC
- Coil Current: 84 mA
- Contact Rating: 30A
- Typical Pulse Voltage: >700 Vpp
- Includes oscilloscope connection points for voltage monitoring

and EXCLAMATION POINT graphics are used to highlight certain topics that require extra precaution.

Watch for These Symbols:



The lightning flash with the arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of “dangerous voltage” inside the product that may constitute a risk of electric shock.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the product.

Important Safety Instructions

1. Read and keep these instructions. Follow all instructions and heed all warnings.

2. Do not use this apparatus near water. To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.



3. Disconnect this product from all sources of electrical power before cleaning. Use a damp cloth for cleaning. Clean the outside of the product only.



4. Care should be taken so that objects do not fall into the product.
5. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
6. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
7. Only use attachments/accessories specified by the manufacturer.

8. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as liquid has been spilled or objects have fallen



into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

9. Do not remove product covers. No user serviceable parts inside. Refer servicing to qualified service personnel.
10. Always use the appropriate wire size and insulator for maximum voltage and current expected.
11. Operating conditions: 10°C to 40°C; Humidity: 70% or less, non-condensing.

Unpacking

Carefully unpack and inspect the unit. Please note any damage for future reference and notify the shipping company immediately if damage is found. Also, please save the shipping carton and materials as evidence of damage and/or for returning the unit for repair.

CR-600 Setup

(see **Figure 1**)

1. Before connecting the CR-600 unit, make sure all equipment you are connecting is disconnected from AC power.

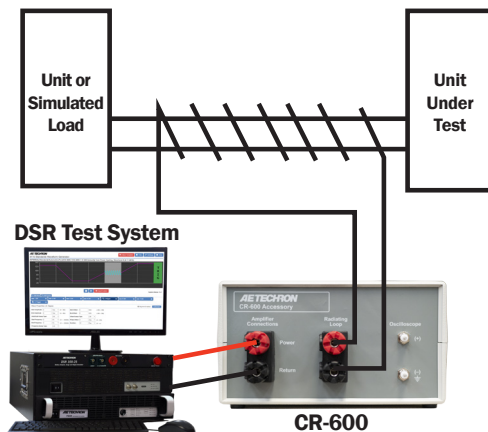


Figure 1 – Test Setup for RTCA DO160 Section 19.3.5 using the CR-600

2. Connect from your test system or signal generator/power amplifier combination to the dual binding posts labeled Amplifier Connections on the CR-600 front panel. Connect the positive output terminal from your test system or amplifier to the connector labeled Power on the CR-600. Connect the negative/ground output terminal from your test system or amplifier to the connector labeled Return.
3. Connect the radiating loop to be wired around the connecting cables from the DUT to simulated load, connecting the two ends of the loop to the CR-600's front-panel dual binding posts labeled Radiating Loop.
4. If desired, two oscilloscope probes can be connected to the (+) and (-) Oscilloscope terminals on the front panel. These probes can be used for monitoring the voltage applied to the radiating loop.

NOTE: If the oscilloscope ground is connected to the positive oscilloscope terminal, the chattering pulse train will not occur. This will not damage the unit

and, after corrections have been made, normal operation can resume.

Operation

1. Configure your test system or signal generator/power amplifier combination to apply a 28 VDC to the Amplifier Connections terminals of the CR-600. This will cause the chattering pulse train to begin.
2. Adjust the duration and duty cycle of the 28 VDC supply to adjust the length and repetition period of the chattering pulse train.

NOTE: If the CR-600 is not performing as expected, ensure that all of the connections to the equipment have been made correctly. If the oscilloscope ground has been connected to the positive oscilloscope terminal, the chattering pulse train will not occur. This will not damage the unit and, after corrections have been made, normal operation can resume.

Sample Output

Refer to **Figures 2 - 4** for a representation of the expected output of the CR-600 when used for testing to the DO160 standards.

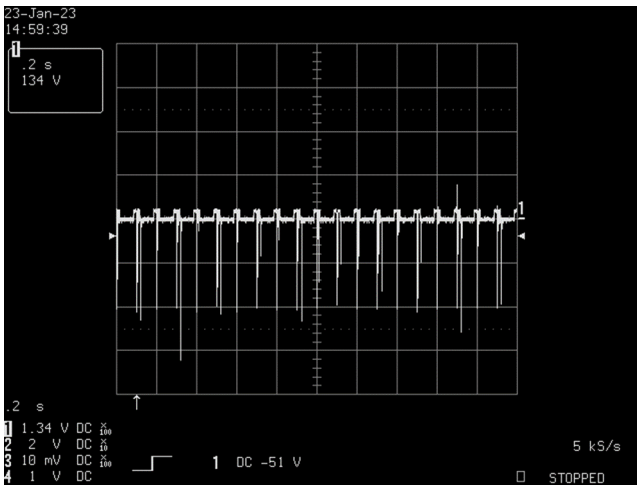


Figure 2 – Example of output from the CR-600 when adjusted to yield a pulse repetition rate of eight to ten pulses per second

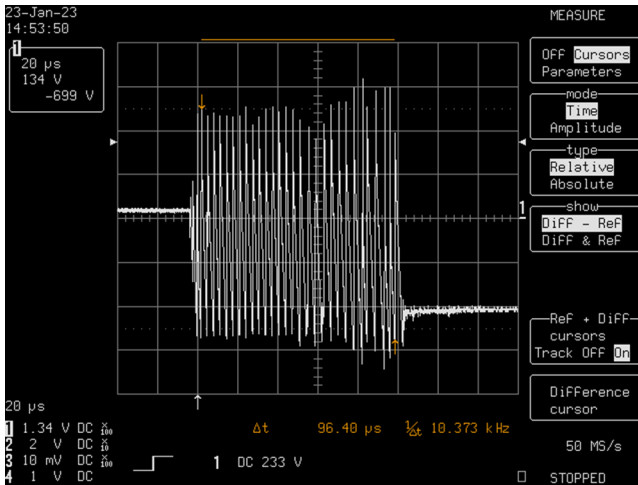


Figure 3 – Example of output from the CR-600 when adjusted for a pulse sequence with an amplitude greater than or equal to 600 Vpp and a total duration of 50 to 1000 microseconds

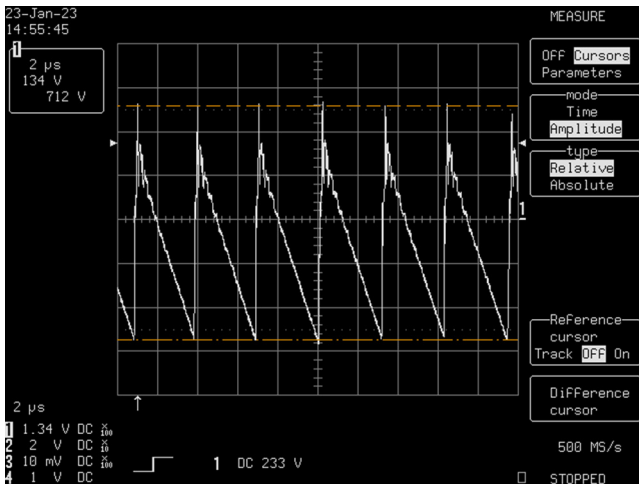


Figure 4 – Example of output from the CR-600 when adjusted for a repetition period of 0.2 to 10 microseconds

Equipment Maintenance



To prevent electric shock, do not remove product covers. No user serviceable parts inside.

Refer all servicing to qualified service personnel.

Disconnect this product before cleaning. Use a damp cloth for cleaning. Clean the outside of the product only.

Factory Service

If the unit fails to perform, it may need to be returned for Factory Service. All units under warranty will be serviced free of charge (customer is responsible for one-way shipping charges as well as any custom fees, duties, and/or taxes). Please review the Warranty included with this Instruction Sheet for more information.

All service units must be given Return Authorization by AE Techron, Inc. before being returned. Return Authorizations can be requested on our website or by contacting our Customer Service Department.

Please take extra care when packaging your unit for repair. It should be returned in its original packaging or a suitable alternative. Replacement packaging materials can be purchased for a nominal fee.

Please send all service units to the following address and be sure to include your Return Authorization Number on the box.

AE Techron, Inc.
Attn: Service Department / RMA#
2507 Warren Street
Elkhart, IN 46516

Specifications

Performance Specifications

Coil Voltage: 24 VDC

Coil Current: 84 mA

Contact Rating: 30A

Typical Pulse Voltage: >700 Vpp

Controls and Connectors

Amplifier Connections:

Dual binding posts

Radiating Loop:

Dual binding posts

Oscilloscope:

Dual turret connectors

Physical Characteristics

Case:

Injection-molded plastic

Operating Conditions,

Temperature: 10°C to 40°C (50°F to 104°F)

Humidity: 70% or less, non-condensing

Recommended Ambient Temperature:

25°C (77°F)

Cooling:

Natural air convection

Weight:

1.5 lbs. (0.68 kg)

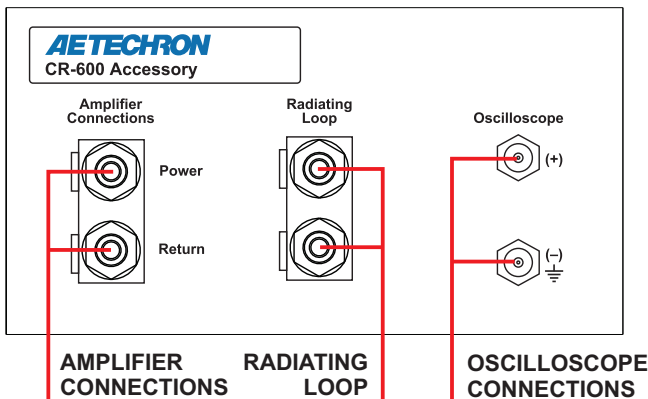


Figure 3 – CR 600 Connectors

Dimensions (WxDxH):

6.25 in. x 7.25 in. x 3.25 in. (15.9 cm x 18.4 cm x 8.3 cm)

Additional Product Information

These instructions do not include all of the details of design, production, or variations of the equipment. Nor do they cover every possible situation which may arise during installation, operation or maintenance.

Information Accuracy

The information provided in this manual was deemed accurate as of the publication date. However, updates to this information may have occurred. To obtain the latest information for your unit, please visit the AE Techron website at www.aetechron.com.

Trademark Notice

AE Techron is a registered trademark of AE Techron, Inc. Other trademarks are the property of their respective owners.

One-Year, No-Fault Warranty

SUMMARY OF WARRANTY

AE TECHRON INC., of Elkhart, Indiana (Warrantor) warrants to you, the ORIGINAL COMMERCIAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW **AE TECHRON INC. product**, for a period of one (1) year from the date of purchase, by the original purchaser (warranty period) that the product is free of defects in materials and workmanship and will meet or exceed all advertised specifications for such a product. We further warrant the new **AE Techron product regardless of the reason for failure, except as excluded in the Warranty.**

ITEMS EXCLUDED FROM WARRANTY

This AE Techron Warranty is in effect only for failure of a new AE Techron product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, or loss which is covered under any of your insurance contracts. This warranty does not extend to any product on which the serial number has been defaced, altered, or removed. It does not cover damage to loads or any other products or accessories resulting from **AE TECHRON INC.** product failure. It does not cover

defects or damage caused by the use of unauthorized modifications, accessories, parts, or service.

WHAT WE WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair or replacement, at our sole discretion. Warranty work can only be performed at our authorized service centers or at our factory.

Expenses in remedying the defect will be borne by **AE TECHRON INC.**, including one-way surface freight shipping costs within the United States. (Purchaser must bear the expense of shipping the product between any foreign country and the port of entry in the United States and all taxes, duties, and other customs fees for such foreign shipments.

HOW TO OBTAIN WARRANTY SERVICE

When you notify us of your need for warranty service, we will give you an authorization to return the product for service. All components must be shipped in a factory pack or equivalent which, if needed, may be obtained from us for a nominal charge. We will take corrective actions within a reasonable time of the date of receipt of the defective product. If the repairs made by us are not satisfactory, notify us immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

You are not entitled to recover from us any consequential or incidental damages resulting from any defect in our product. This includes any damage to another product or products resulting from such a defect.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this warranty. The warranty is not extended by the length of time for which you are deprived of the use of this product. Repairs and replacement parts provided under the terms of this warranty shall carry only the unexpired portion of this warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

There is no warranty that extends beyond the terms hereof. This written warranty is given in lieu of any oral or implied warranties not contained herein. We disclaim all implied warranties, including, without limitation, any warranties of merchantability or fitness for a particular purpose. No action to enforce this Warranty shall be commenced later than ninety (90) days after expiration of the warranty period. This statement of warranty supersedes any others contained in this manual for AE Techron products.

AE Techron, Inc.

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