



DEH-500011 Installation, Operation, and Maintenance Manual

# SecoVac\* Test Box

For use with 5kV-15kV IEEE SecoVac Vacuum Circuit Breakers



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## Hazard Classifications

The following important highlighted information appears throughout this document to warn of potential hazards or to call attention to information that clarifies a procedure

Carefully read all instructions and become familiar with the devices before trying to install, operate, service or maintain this equipment.

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### CAUTION

Failure to comply with these instructions may result in product damage.

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Seco Cube®      SecoBloc®  
SecoVac® VB2+      Multilin®

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## Warranty

This document is based on information available at the time of its publication. While efforts have been made to ensure accuracy, the information contained herein does not cover all details or variations in hardware and software, nor does it provide for every possible contingency in connection with installation, operation, and maintenance. Features may be described herein that are not present in all hardware and software systems.

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No warranties of merchantability or fitness for purpose shall apply.

Contact your local sales office if further information is required concerning any aspect of SecoGear switchgear and SecoVac VB2+ breaker operation or maintenance.

# 1. Introduction

This manual provides complete installation instructions and operation and maintenance information for GE SecoVac Test Box.

## Safety

Each site must maintain a safety program for the protection of personnel, as well as other equipment, from the potential hazards associated with electrical equipment.

The following requirements are intended to augment your company's safety program, but they do NOT supplant your responsibility for devising a complete safety program.

The following basic safety requirements are applicable to all major electrical equipment, such as switchgear or switchboards. GE neither condones nor assumes any responsibility for practices that deviate from the following:

1. All conductors must be assumed to be energized unless their potential has been measured as ground and adequate capacity-grounding assemblies have been applied to prevent energizing. Many accidents have been caused by back feeds from a wide variety of sources.
2. Although the provided interlocks reduce some of the risks, the individual's actions while performing service or maintenance are essential to prevent accidents. Each person's knowledge, mental awareness, and planned and executed actions often determine if an accident will occur. The most important method of avoiding accidents is for all associated personnel to carefully apply a thorough understanding of the specific equipment – from the viewpoints of its purpose, its construction, its operation – and the situations that could be hazardous.

All personnel associated with installation, operation, and maintenance of electrical equipment, such as power circuit breakers and other power handling equipment, must be thoroughly instructed, with periodic retraining, regarding power equipment in general, as well as the particular model of equipment with which they are working.

Instruction books, actual devices, and appropriate safety and maintenance practices such as OSHA publications, National Electric Safety Code (ANSI C2), National Electric Code, and National Fire Protection Association (NFPA) 70B Electrical Equipment Maintenance must be closely studied and followed. During actual work, a supervisor should audit practices to assure conformance.

## Maintenance

Excellent maintenance is essential for the reliability and safety of any electrical equipment:

- Maintenance programs must be designed for the specific application, well planned and carried out consistent with both industry experience and manufacturer recommendations.
- The local environment must always be considered, including such variables as ambient temperatures, extreme moisture, number of operations, corrosive atmosphere, major insect problems, and any other unusual condition or abuse of the application.

One of the critical service activities, sometimes neglected, involves the calibration of various control devices. A proper calibration monitors conditions in the primary and secondary circuits, sometimes initiating emergency corrective action, such as opening or closing circuit breakers

In view of the vital role of these devices, it is important that a periodic test program be followed. GE recommends checking all significant calibrations at an interval of one to two years, until you have accumulated enough experience to select a test interval better suited to the individual requirements. The interval between periodic checks will vary depending upon the local environment, the type of device, and the user's experience.

Some devices can be adequately tested using test sets. Specific calibration instructions on particular devices are typically provided in the vendors' documentation. However, these manuals cannot include every possible part that could require attention, particularly over a very long service period or under adverse environments. Maintenance personnel must be alert to deterioration of any part of the supplied switchgear, taking actions as necessary to restore it to serviceable status.

Industry publications of recommended maintenance practices such as ANSI/NFPA 70B, Electrical Equipment Maintenance, should be carefully studied and applied in each site's formation of planned maintenance. Visit [geindustrial.com](http://geindustrial.com) for the latest publications.

Some customers may require additional assistance from GE in the planning and performance of maintenance. GE Industrial Solutions offers onsite services to perform maintenance or provide technical assistance.

The performance and safety of all equipment may be compromised by the modification of supplied parts or their replacement by non-identical substitutes. All such design changes must be qualified to ANSI/IEEE Standard C37.59

Maintenance personnel should methodically keep written maintenance records as an aid in future service planning and equipment reliability improvement. Promptly report any unusual experiences to GE.

## 2. Receiving, Handling and Storage

### Receiving

Each test box is carefully inspected before shipment. Upon receipt of the test box, perform a visual inspection to ascertain if any damage has been sustained in shipping or if there are any loose parts.

If injury or rough handling is evident, immediately file a damage claim with the transportation company and the nearest General Electric Sales Office should be notified.

It is expected that due care will be exercised during the unpacking and installation of the test box so that no damage will occur from careless or rough handling, or from exposure to moisture or dirt.

### Handling

Normal care in handling the test box will result in a trouble-free installation and long testing life.

### Storage

It is recommended that the test box be immediately mounted on its permanent location. If this is not possible, the following precautions should be taken to assure proper storage of the test box:

1. The test box should be stored in a clean location, free from corrosive gases or fumes; particular care, for example, should be taken to protect the equipment from moisture and dust, as this combination has a very corrosive effect on many parts.
2. If the test box is stored for any length of time, it should be inspected periodically to see that corrosion has not started and to ensure good mechanical condition. Should the box be stored under unfavorable atmospheric conditions, make sure to clean and dry the Test Box before placing it into service.

### 3. Description And Principles of Operation

The test box, catalog number BMBC1 (Figure 3-1), is used to operate a SecoVac circuit breaker that has been removed from the metal-clad equipment. It provides a convenient means of accessing the electrical close and trip circuits of the breaker during maintenance and inspection procedures.

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#### CAUTION

Although the breaker compartment door may be opened in any position, it is recommended that the door be opened only when the breaker is in the DISCONNECTED/TEST position.

#### Operation

With the Test Box properly secured at the desired testing location, connect (customer-supplied) power supply conductors to the MCCB terminals as indicated in Figure 3-3.

To test a SecoVac vacuum circuit breaker, make sure the Control Power switch is OFF, and connect the secondary coupler on the end of the Test Box harness to the mating secondary plug on the circuit breaker umbilical cord. Turn the control power on by rotating the Control Power switch to ON. When the control power is turned on, the spring charge motor will immediately start and charge the closing springs, if not already charged.

To close the breaker, press the green Close button. Press the red Trip 1 button to open the breaker.

If the circuit breaker being tested is equipped with an optional undervoltage release coil (UVR) or a second trip coil (Trip 2), press the indicated pushbuttons to test these features.



Figure 3-1: SecoVac Test Box

This unit (Figure 3-2) is designed to be wall or panel mounted. It has a Control Power selector switch, Close pushbutton for closing the breaker, and a Trip 1 pushbutton for opening the breaker. Additional pushbuttons are included to test circuit breakers that have either a second trip coil (Trip 2) or an undervoltage release (UVR) device.

Inside the unit are a supply power mini breaker, terminal strip, and a ground provision. There is also a grommet on the left for incoming power (customer provided, Figure 3-3) and a conduit on the right for the secondary connector.

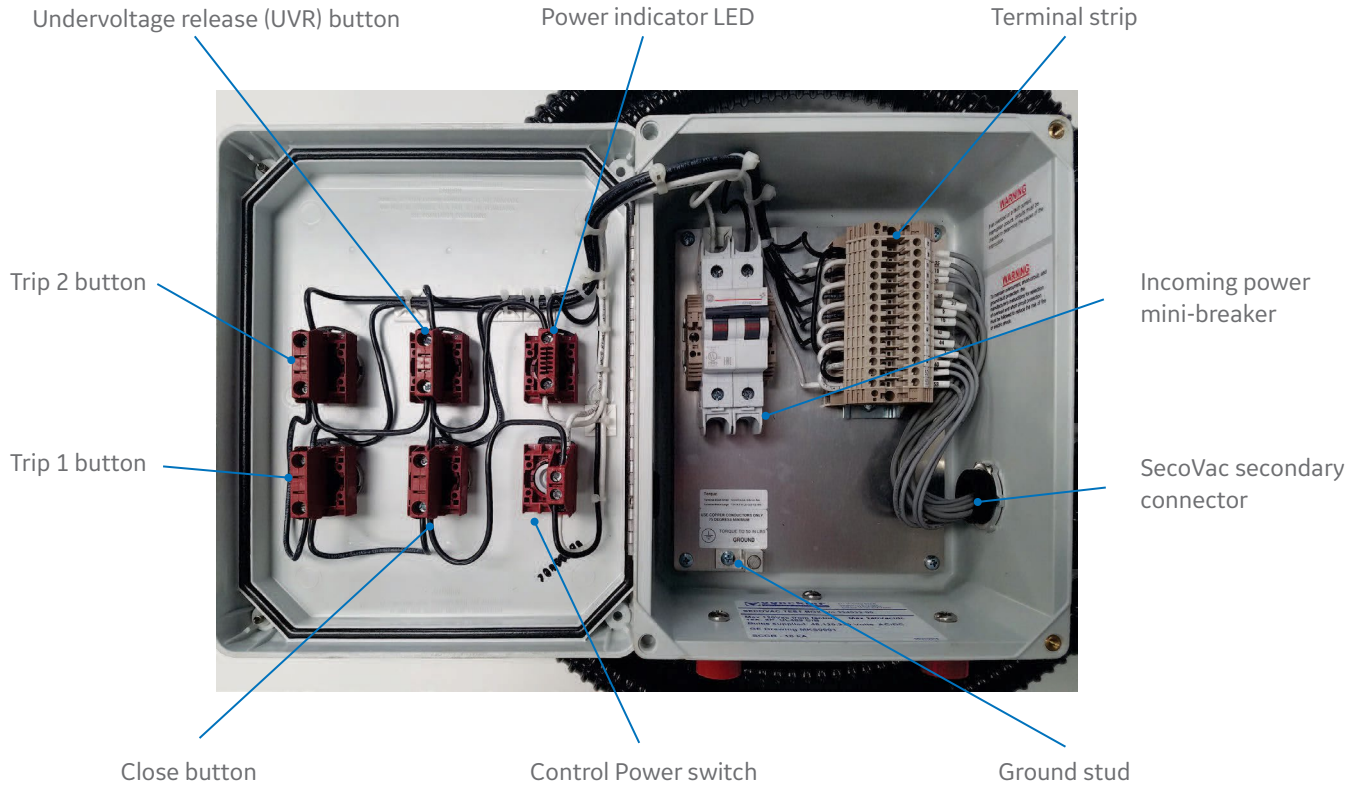


Figure 3-2: Test Box Components



Figure 3-3: Incoming Power (Customer Provided)



## 4. Installation

The test box should be installed on a wall or panel at a location where maintenance and testing of the breaker can be conveniently done.

Make sure that the green ground conductor is connected to electrical ground.

Conduits may be installed for cables to supply control power for testing. A 1-inch diameter grommet inside the Test Box on the left side accommodates the customer-supplied wiring (Figure 3-1).

Refer to the wiring diagram (Figure 4-3) for control power connections.

Front View

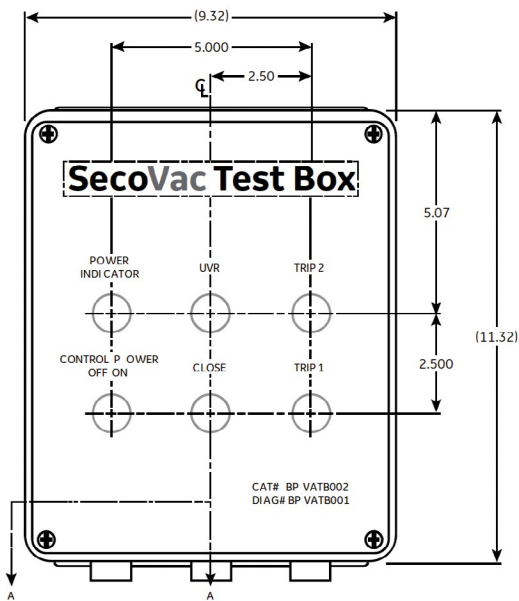


Figure 4-1: Test Box Layout

Front View - Cover Removed

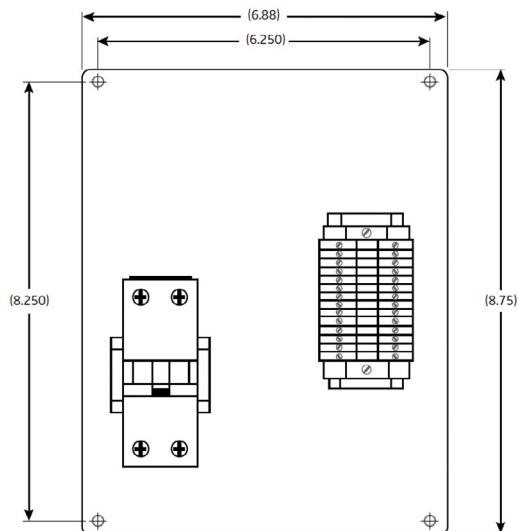
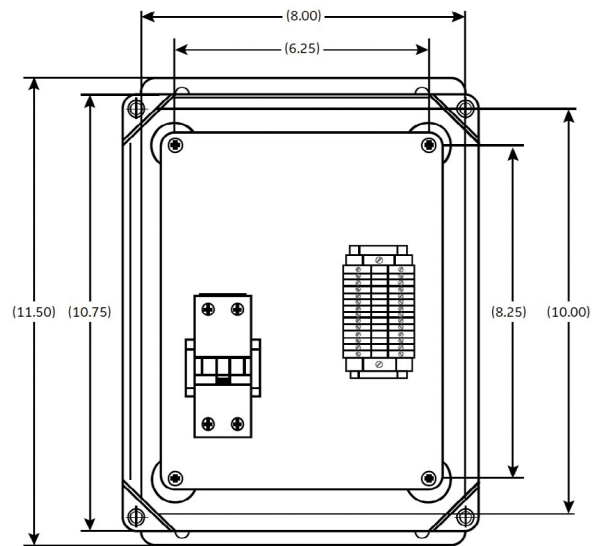
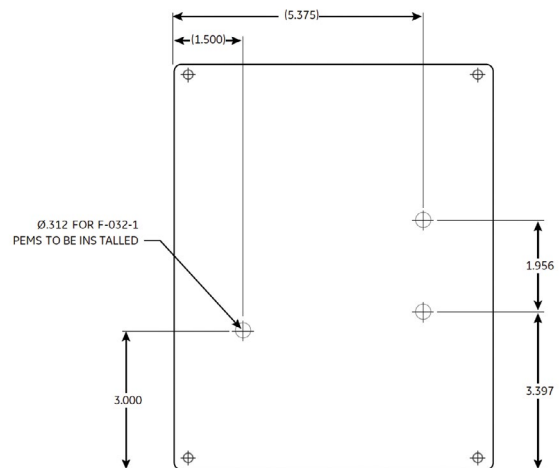


Figure 4-2: Internal Mounting



An AC or DC control power source can be connected to the incoming power connections as shown in Figure 4-3. Since the SecoVac breaker coils are dual rated, an AC control power source can be used to test a breaker that normally would use DC control power.

The SecoVac Test Box can be used to test breakers using the following control voltages: 48VDC, 125VDC, 250VDC, 120VAC, or 240VAC. The Test Box requires that the indicating lamp be changed when different voltages are used. The Test Box is initially set for 120VAC/125VDC control. The lamp would need to be changed for 48VDC or 240VAC/250VDC control power applications.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

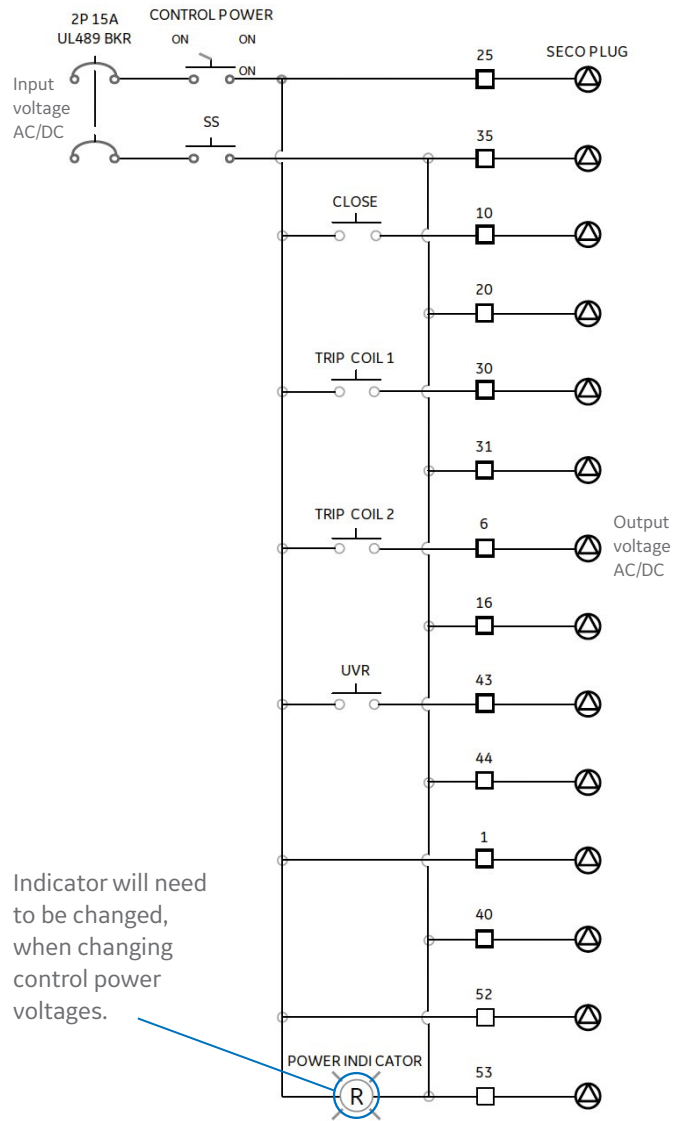


Figure 4-3: Control Power Connections

## 5. Maintenance

The contact surfaces of the coupler require periodic lubrication to inhibit oxidation and minimize friction. It is recommended that during each maintenance interval, the pins of the breaker coupler be lightly coated with 0282A2048P009 grease.

Aside from keeping the unit clean and dry, the most important thing is to return the clamp to the box area when not connected to a breaker.

## 6. Optional Accessories

### Breaker Test Jumper(Optional)

An optional test jumper catalog number BMBJ1 can be ordered, that will allow a breaker placed on the floor outside the cubicle to be tested utilizing the lineup control circuit and the breaker control switch on the compartment door. This jumper will connect the secondary disconnect plug on the breaker to the secondary disconnect coupler in the breaker compartment. Normal open and close operation can be verified by use of the control switch.









Imagination at work

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