



AMVAC™ and ADVAC™ Breaker commissioning procedures

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1 Important Safety Notes & Warnings

Equipment operation depends on proper handling, installation, and maintenance. Neglecting fundamental requirements may lead to injury of personnel, failure of the equipment and property damage.

Safety as described in this instruction book involves two conditions:

- Personal injury.
- Product or property damage.

1.1 Safety Notations

Safety notations alert personnel to possible death, injury or property damage situations. The safety notations appear before the step in which the condition applies. The one safety notice and three hazard levels notations are:

WARNING

“Warning” indicates a hazardous situation that has some probability of severe injury and substantial property damage.

DANGER

“Danger” indicates a hazardous situation that has a high probability of death, severe injury, and substantial property damage.

CAUTION

“Caution” indicates a hazardous situation that may result in minor or moderate injury and/or property damage.



“NOTICE” indicates a statement of company policy as it relates to the safety of personnel or protection of property

Personnel installing, operating, or maintaining this equipment must have thorough knowledge of all applicable local, regional, industry, government, and OSHA safety procedures as well as commonly accepted safe working practices. Personnel working in or around this equipment must also exhibit common sense and good judgment regarding the potential hazards for themselves and other personnel in the area. These instructions are intended for use by fully qualified personnel and are not a substitute for adequate training, experience and supervision.

Should clarification or additional information be required, refer the matter to your nearest ABB Sales office.

2 Introduction

2.1 General Instructions

Read these instructions carefully before installation and use as a guide during installation and initial operation. Use of these instructions will facilitate proper receiving of the equipment and prolong its useful life.

2.2 Scope of Instructions

The instructions are general in nature. They cover requirements for receiving, installation, and functional checks as applied to ADVAC and AMVAC medium voltage circuit breakers. These instructions do not attempt to cover all possible issues that may arise during receiving to commissioning of breakers.

Information on particular installations appears in the following:

- Bills of Materials that list electrical devices and equipment.
- Single line drawings showing power connections.
- Elementary and schematic diagrams.
- Connection diagrams

3 Inspection, Handling and Storage

3.1 Inspection

Before shipment, the equipment is inspected and marked with its rating. Breakers are shipped in the open and discharged condition in separate crates. Upon receipt of the equipment, use the breaker commissioning check list in the back of this document to examine the shipment for damage or missing components. Follow the procedures outlined in the next section.

3.2 Handling

Transport breakers upright using proper lifting equipment. Take the high center of gravity into account. Carry out loading operations only when it has been ensured that all precautionary measures to protect personnel and materials have been taken into consideration.

3.3 Storage

For circuit breakers, store upright in their original shipping carton oriented as indicated on the shipping crates. See breaker installation and operation manual for details on breaker storage.

4 Procedures

4.1 Receiving inspection

Inspect shipping crate for damages, and note condition of tip & tell if equipped. Check the contents against the packing list before discarding any packing material. Check the consignment for completeness and lack of any damage (e.g. moisture and its detrimental effects). In case of doubt, the packing must be opened and then properly resealed, when intermediate storage is necessary. If any quantities are short, or defects or transport damage is noted, these must be documented on the respective shipping document. Notify ABB and the carrier at once of any discrepancies. If there is damage from improper handling, file a claim for damages at once with the carrier and notify ABB.

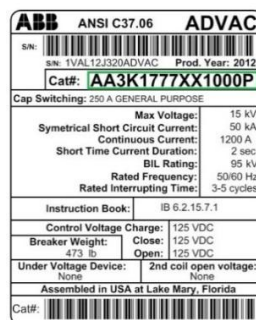




ABB ANSI C37.06 ADVAC	
SN: 	
SN: 1VAL12J320ADVAC Prod. Year: 2012	
Cat#: AA3K1777XX1000P	
Cap Switching: 250 A GENERAL PURPOSE	
Max Voltage:	15 kV
Symmetrical Short Circuit Current:	50 kA
Continuous Current:	1200 A
Short Time Current Duration:	2 sec.
BIL Rating:	95 kV
Rated Frequency:	50/60 Hz
Rated Interrupting Time:	3-5 cycles
Instruction Book:	IB 6.2.15.7.1
Control Voltage Charge:	125 VDC
Breaker Weight:	473 lb
Close:	125 VDC
Open:	125 VDC
Under Voltage Device:	None
2nd coil open voltage:	None
Assembled in USA at Lake Mary, Florida	
Cat#: 	

Figure 4.1 Rating label

Note: ABB is not responsible for damage, after delivery of the equipment to the carrier

Remove crate by lifting box off of shipping pallet (Figure 4.2). Remove plastic bag from breaker if covered. Remove both clamp screws from pallet (Figure 4.3). Insure that breaker is in the open and discharged state by verifying the indicator position on the front of breaker. Inspect the breaker according to the breaker check list for damage. It is recommended that the breaker is photographed from all sides with the rating label ledge able.

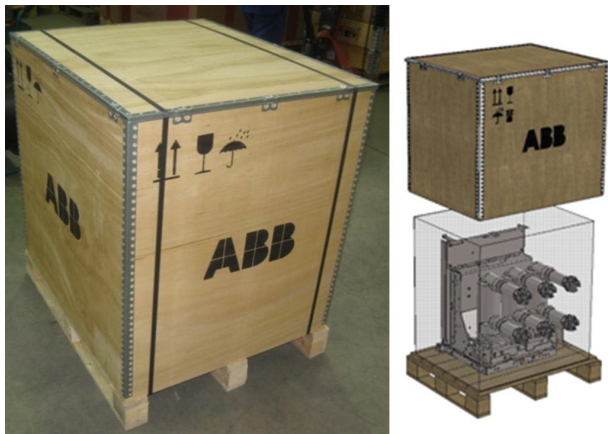


Figure 4.2 Crated breaker



Figure 4.3 Clamp screws

4.2 Truck mounting

⚠ WARNING

- ***Always follow safe work practices when lifting the circuit breakers to protect the safety of personnel and equipment.***
- ***Always inspect lifting hook for signs of wear or damage before use.***
- ***Do not use a lifting hook that is damaged or worn.***
- ***The lifting device should be suitably rated for lifting the circuit breaker load.***
- ***The lifting hook IS NOT to be used for insertion of drawout circuit breakers into switchgear compartments.***
- ***The lifting hook IS NOT to be used as the sole means of support when servicing the circuit breaker.***



Always insure floor is clear of debris before lowering breaker onto floor.



Always be careful of breaker secondary plugs while moving breaker on the floor.



Never roll drawout breaker across uneven surfaces.

Note: Always take photographs to document any damage, also take a photo of the rating label.

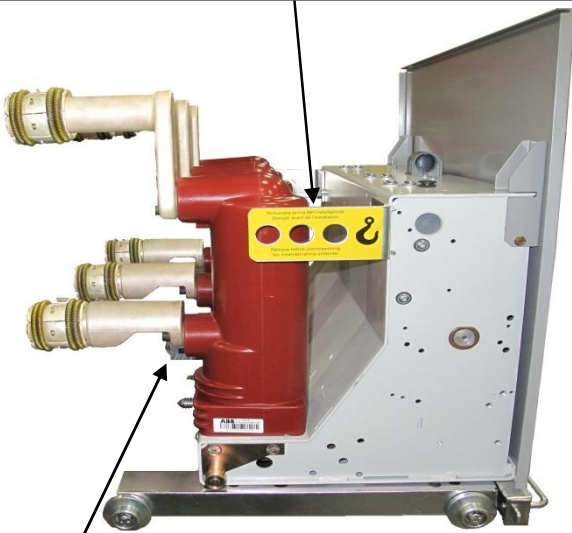
1. Remove breaker from shipping pallet using lifting angles provided on the back of the module (Figure 4.4).

Lifting hook: Attach one lifting hook to each side of the circuit breaker's lifting angles.



Figure 4.4 Lifted breaker

Remove the lifting angles before inserting breaker in cell.



Do not use Primary pole assemblies to move or lift breaker.

Figure 4.5 Lifting angles

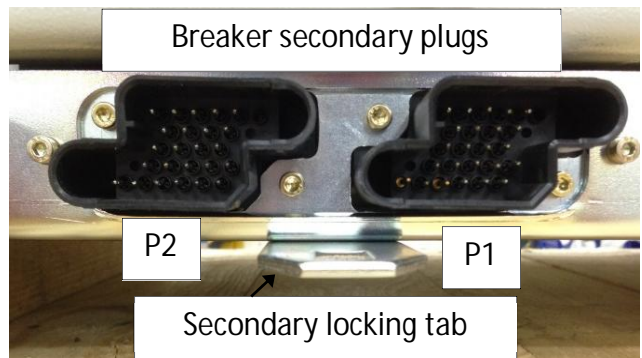


Figure 4.6 Secondary plugs

2. Lower the breaker on to the floor. With the lift truck platform at ground level and the foot brake engaged (Figure 4.7).

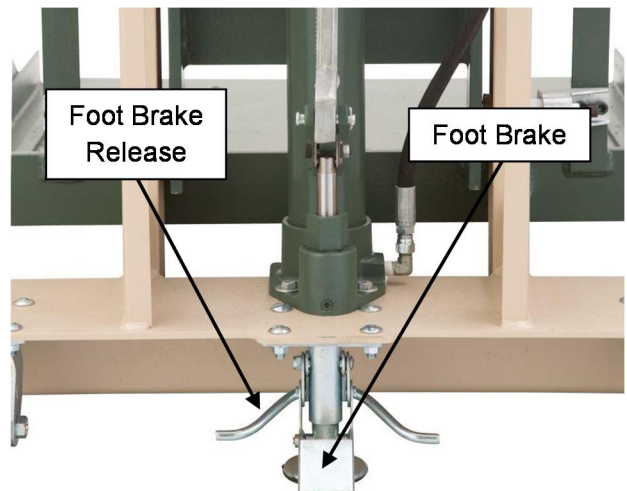


Figure 4.7 Lift truck foot brake

3. Push the interlock release handles (Figure 4.10) on the breaker inward and roll the breaker onto the lift truck facing toward the truck (Figure 4.12). It may be necessary to use the racking handle to rotate the racking screw slightly left or right to free up the truck handles (Figure 4.8).



Figure 4.8 Truck racking screw

4. Roll completely onto the platform until the breaker locking tabs (Figure 4.9) engage the breaker interlock slot. (Figure 4.11)

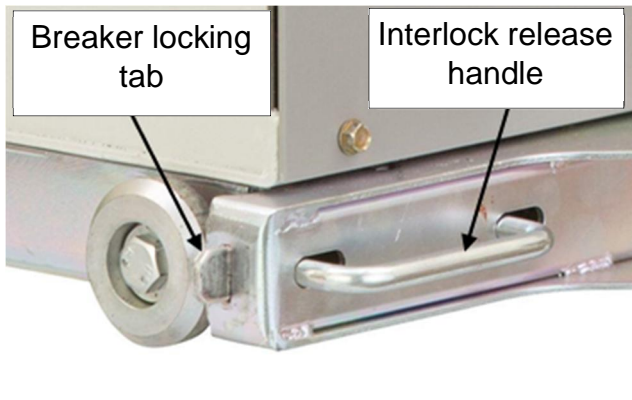


Figure 4.9 Breaker truck interlock tabs and handles



Figure 4.10 Truck handle actuation

Note: ADVAC Breaker must be discharged for truck handles to operate.

Figure 4.11 Lift truck platform



Figure 4.12 Breaker on lift truck



The breaker interlock tabs must engage the slots in the lift truck platform before releasing the foot-brake and moving the lift truck. Lower the lift truck platform before transporting draw-out modules from upper positions with the lift-truck.

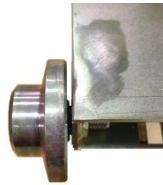
4.3 Functional Test

For operation, component identification and locations refer to the breaker IB provided with the breaker. ADVAC breakers refer to IB 1VAL050503-MB, AMVAC breakers refer to IB 1VAL050601-MB.

With the circuit breaker either on the floor or on a suitable work surface. Use the breaker IB and the commissioning checklist in the back of this document to record any deficiencies.

Check breaker truck:

- a. Truck handles move inward with little resistance and spring back outward (Figure 4.10).
- b. Racking screw release lever moves down with little resistance and returns up when released (Figure 4.8).
- c. Wheels are parallel with truck



and rotate freely.

Figure 4.13 Truck wheel

Check breaker manual operation:

- a. Perform a manual charge insuring that charge indicator changes state.
- b. Perform a manual close operation. (ADVAC only) And insure closed indicator is shown.
- c. Perform a manual open operation. (ADVAC only) Note if there are any deficiencies during the operations.

Check the breaker's secondary power requirements listed on the front label and insure that the breaker is of the correct control power of the supplying equipment for the following tests (Figure 4.1).

Apply power to the breaker using a breaker test cabinet (Figure 4.14) or a Switchgear umbilical cable.

Note: Plug P1 (Figure 4.6) is toward the center of breaker.

- a. Breaker charges and indicates "Charged" or "Ready" in less than 8 seconds.
- b. Perform a local Close by using the Close push button on breaker.
- c. Perform a local Open by using the Open push button on breaker.
- d. Perform a remote Close by using the Close push button on the test cabinet or gear.
- e. Perform a remote Open by using the Open push button on the test cabinet or gear.
- f. If breaker is supplied with UV close the breaker and insure that the breaker opens when power is removed.



Figure 4.14 Breaker test cabinet

4.4 Primary Circuit Test

The primary circuit of the breaker has been tested prior to shipment. Retesting prior to energization will insure no internal transportation damages have occurred. Verification of vacuum can be performed by a low-frequency AC withstand test. Additionally a contact resistance test by performing a contact resistance test is recommended.

Rated Max Voltage	Dielectric Test Value, 1 Minute Dry AC rms New Condition reference c37.06	Dielectric Test Value, 1 Minute Dry AC rms Field Condition reference c37.20.2
4.76kV	19kV	15kV
8.25kV	36kV	27kV
15kV	36kV	27kV
27kV	60kV	45kV


Figure 4.15 Primary low-frequency withstand test voltages

To verify the integrity of the vacuum interrupters perform the following low-frequency withstand voltage test:

1. Open the breaker (no control power supplied to breaker)
 - a. Connect the high potential lead to one terminal.
 - b. Ground the remaining 5 terminals and breaker frame.
2. Start machine with output potential at 0 (zero) VAC
3. Increase the potential to the required voltage (Figure 4.15)
4. Hold for one minute
5. Decrease potential to 0 (zero) and turn off machine
6. Repeat for the remaining 5 terminals

A successful withstand indicates satisfactory vacuum integrity. Remove power from the breaker.

⚠ CAUTION



CAUTION X-Rays

High voltage applied across an open gap in a vacuum can produce X-radiation. When the breaker is fully open the contact spacing is such that when tested with the voltages specified, X-radiation at one meter is below the level of concern. A danger could exist at voltages above the dielectric test voltage or reduced contact spacing caused by a major internal mechanical failure of the breaker.

Contact resistance is measure at the factory according to the ANSI 37.09 using a 200A μ ohm meter. This DC resistance test should be performed after each fault the primary circuit, from terminal to terminal of each pole unit, in the close position shall be measured with at least 100 A of dc current flowing in the circuit and shall not exceed the limit set for the rating of the circuit breaker by the manufacturer.

Remove lifting angles from breaker.

Note: Breaker will not fully rack in with lifting angles installed.

Cell Inspection



Before inserting a breaker into a module, remove foreign objects, tools and debris, or obstructions from inside the module.

Prior to first insertion of breaker into cell, it is important to inspect the breaker cell operating components listed in (Figure 4.16).

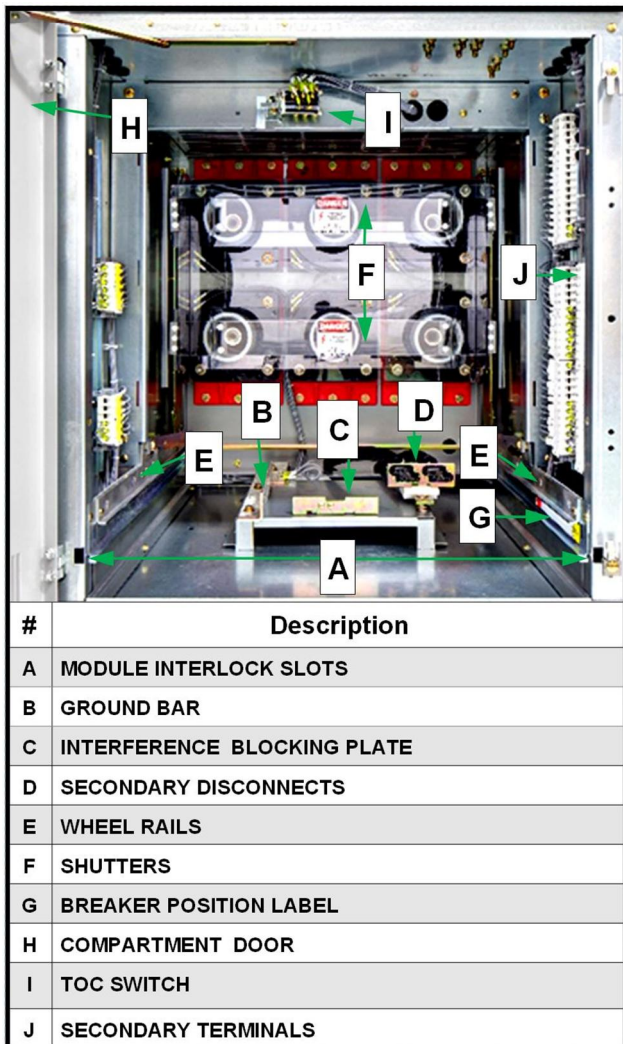


Figure 4.16 Cell locations

⚠ DANGER

Insure that all power to the cell has been removed and proper lock-out tag-out procedures have been performed prior to cell inspection.

All circuit breakers of like rating are interchangeable

Circuit breakers have three positions in the housing.

1. The DISCONNECT position disengages the main disconnecting devices, and the control contacts on the breaker. They are a safe distance from the stationary part of the device located on the housings.
2. The TEST position disengages the main disconnecting devices, and engages the control contacts. This position allows operation of the circuit breaker for testing.
3. The CONNECTED position engages the main and control disconnecting devices on the breaker.

Mechanical interlocks prevent moving a circuit breaker from one position to another unless the circuit breaker is open. The interlocks also prevent closing of the breaker between positions.

4.5 Cell Insertion

1. With the breaker on the lift truck (Figure 4.12).
2. Open the breaker cell door completely (Figure 4.16).
3. Raise the lift truck platform by pumping the foot pedal (Figure 4.17). Release the foot brake and push the lift truck towards the breaker cell.

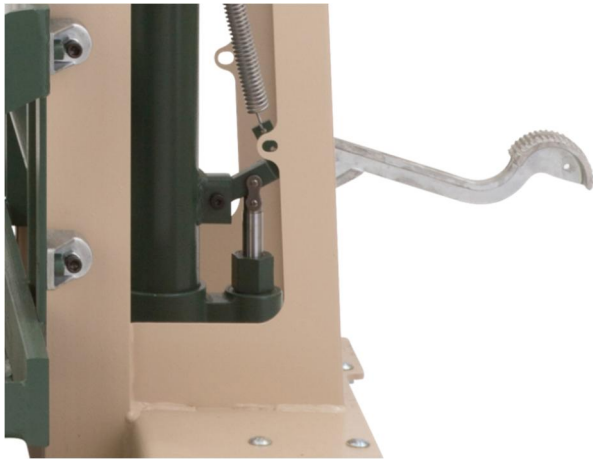


Figure 4.17 Lift truck foot pedal

4. Align the locking tabs (Figure 4.11) of the lift-truck with the lift truck holding slots (Figure 4.18) in the front of the frame. Adjust the lift-truck to the frame to engage the locking tabs with the slots. Adjust the truck platform either by moving up using lift truck foot pedals or lowering the platform with the lift truck control valve (Figure 4.19) to lock the locking tabs in the lift truck holding slot. The truck platform should be horizontal and aligned with the rails in the module. Try pulling the lift truck away from the frame. The locking tabs should be set firmly in place. Set the foot brake.

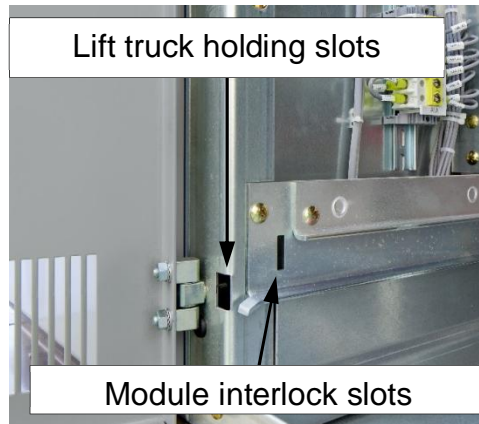


Figure 4.18 Module interlock slots (left hand shown)



Figure 4.19 Lift truck control valve

5. Release the circuit breaker from the lift truck by pulling both module interlock release handles toward the center of the unit simultaneously (Figure 4.10).

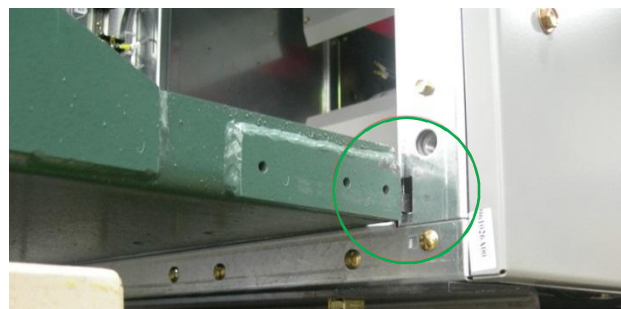


Figure 4.20 Truck locked onto cell

Note: Breaker will not fully rack in with lifting angles installed.

6. Push the circuit breaker straight into the module. Keep the unit level as possible. Do not raise or lift the circuit breaker.
7. Align the breaker locking tabs (Figure 4.11) with the module interlock slots (Figure 4.18).
8. Engage the breaker locking tabs by returning the handles to their outward position.
9. Verify that the handles are fully outward and the breaker locking tabs have engaged fully into the module interlock slots.

Note: The unit will not rack into the TEST position if the Module Interlock Tabs are not properly engaged with the frame.

10. Disengage the lift-truck by raising the platform via the foot pedal, release the foot brake, and move it away from the frame. The circuit breaker is now in the DISCONNECTED position (Figure 4.21).
11. Close and secure the breaker compartment door.



Figure 4.21 Circuit breaker in DISCONNECT position

4.6 Racking, DISCONNECT to TEST

To rack from the DISCONNECTED position to the TEST Position: Press down on the racking release handle on the breaker compartment door (Figure 4.22).



Figure 4.22 Racking release handle

1. Engage the racking screw on the breaker with the racking tool and rotate clockwise (CW).
2. Release the handle and continue to rack the unit by rotating the racking tool clockwise until the racking screw stops, approximately 4 turns. The breaker is now in the TEST position and will begin to charge.
3. Verification can be made by confirming the position indicator on the right side breaker rail shows TEST (Figure 4.23).

Note: On some ABB Switchgear, the Breaker “Open” indicating light serves both as the breaker is “Open” and that the breaker has reached either the “Test” or “Connect” position during racking. This is due to the breaker’s TOC “pin monitor” contact being in series with the breaker “Open” indicating light circuit. The pin monitor is only closed when the breaker is in one of the three racking positions “Disconnect”, “Test” and “Connect” and the racking pin has fully seated into position.



Figure 4.23 Circuit breaker position indicator



Figure 4.24 Circuit breaker in CONNECTED position

4.7 In Cell Testing

Functional testing of the breaker should be performed in the test position prior to racking breaker into the CONNECTED position.

1. Insure breaker is charged by the visual charged flag on the front of the breaker. If monitoring of breaker READY signal is being performed, insure breaker READY signal is active.
2. Perform a close of the breaker using either or both the manual closing switch on the gear or associated breaker relay. Check that the breaker is closed and appropriate indicating lights are active.
3. Insure breaker charges and returns to READY status.
4. Perform a open of the breaker using either or both the manual opening switch on the gear or associated breaker relay. Check that the breaker is open and appropriate indicating lights are active.

4.8 Racking, TEST to CONNECT

To rack from the TEST position to the CONNECTED position:

5. Press down on the Racking Release Handle on the breaker compartment door.
6. Engage the racking screw with the Racking Tool and rotate clockwise (CW) approximately 21 turns.
7. Release the handle and continue to rack the unit by rotating the racking tool clockwise. A slight increase in resistance indicates that the unit is engaging the primary contacts. When the racking screw stops, the breaker is now in the CONNECTED position.
8. Verification can be made by confirming the position indicator on the right side breaker rail shows CONNECTED (Figure 4.24).

4.9 Racking, CONNECT to TEST

To rack from the CONNECT position to the TEST position:

1. The breaker must be OPEN before proceeding to the next step.
2. Press down on the racking release handle.
3. Engage the racking screw with the racking tool and rotate counterclockwise (CCW). Release the handle and continue to rotate counterclockwise, from the CONNECTED position into the TEST position.

4.10 Racking, TEST to DISCONNECT

To rack from the TEST position to the DISCONNECTED position:

1. Press down on the racking release handle.
2. Engage the racking screw with the racking tool and rotate counterclockwise (CCW). Release the handle and continue rotating counterclockwise, from the TEST position into the DISCONNECTED position.

▲ WARNING

Do not attempt to remove the breaker from the circuit breaker compartment without the required ramp, dolly or lift truck

4.11 Removal

Removal from the DISCONNECTED position with a lift truck.

1. Open the breaker compartment door.
2. For ADVAC breakers perform a manual close and open operation to discharge the stored energy. Note: if equipped with UV you must disable the UV prior to discharging the breaker.
3. Align the locking tabs of the lift truck with the lift truck holding slots in the front of the frame. Push the lift truck to the frame to engage the locking tabs with the compartment. Lower the truck platform slightly to lock in place. The truck platform should be horizontal and aligned with the rails in the compartment. Set the lift truck foot brake. Try pulling the lift truck away from the frame. The locking tabs should be set firmly in place and the brake set.
4. Release the circuit breaker from the compartment by pulling the interlock release handles toward the center of the unit.
5. Pull the drawout unit straight onto the lift truck platform. Keep the unit level as possible.
6. Align the breaker interlock tabs with the lift truck slots. Engage the breaker interlock tabs by returning the handles to their outward position.
7. Verify that the handles are fully outward and the breaker interlock tabs are in the lift truck slots.

8. Raise the lift truck platform to disengage the lift truck locking tabs, release the foot brake and pull the lift truck away from the frame.



The breaker interlock tabs must engage the slots in the lift truck platform before releasing the foot-brake and moving the lift truck. Lower the lift truck platform before transporting draw-out modules from upper positions with the lift-truck.

Standard Construction

4.12 Standard Color

The standard paint color is ANSI #61. This finish is electro-static powder paint applied over an iron phosphate coating. This process achieves a smooth, uniform paint finish that conforms to all UL requirements.

4.13 Galvanized Steel Frame Construction

Unpainted parts are made of galvanized steel. Galvanized steel greatly exceeds the paint qualifications of ANSI C37.20.2 Section 5.2.8.

4.14 Primary Disconnect Assemblies

Circuit breaker primary disconnects consist primarily of a circle of fingers compressed by a garter spring. The springs are outside the current path. The fingers can be inspected by withdrawing the unit. The primary contacts are high pressure, self-aligning devices. All parts are plated to reduce electrical resistance.

4.15 Secondary Disconnecting Devices

Circuit breakers have self-aligning disconnects sized for the required current. They make contact in the CONNECTED and TEST positions, without the need for a test jumper (see Figure 27).

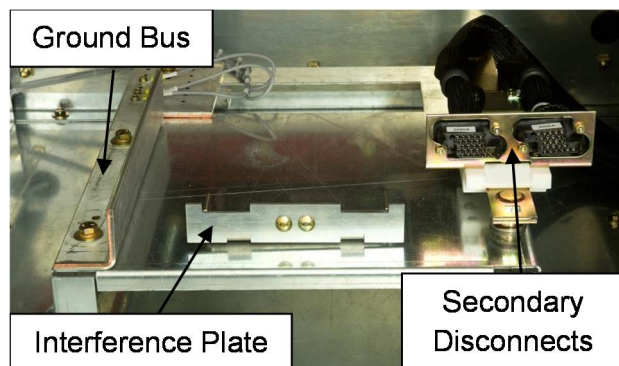


Figure 4.25 Circuit breaker self-aligning secondary's

4.16 Ground Bus Contacts

The ground bus contacts are under the circuit breakers. The circuit breakers are grounded in all positions (see Figure 27).

5 24 Month (Two Year) Inspection

In addition to the annual inspection, perform the following recommended inspection and maintenance at 24 month (two year) intervals, or sooner, if required by local conditions or regulations.

⚠ DANGER

Turn off power ahead of the switchgear before performing any inspection or maintenance operations. Check incoming line terminals to verify that the equipment is de-energized and grounded. Check outgoing terminals to ensure that no back-feed condition exists.

1. Clean the circuit breaker stationary primary contacts. Refer to Circuit Breaker Installation Operation and Maintenance Manual **1VAL050502-MB** for detailed instructions.
2. Inspect secondary wiring bundles for signs of discoloration because of heat or chafing. Check for cracked or embrittled insulation. Replace wire whenever unsure.
3. Inspect primary insulation system for accumulated contamination. Clean insulation with a dry cloth, dry-air, vacuum, or if necessary with an OSHA approved solvent.
4. Check the calibration of protective relays.
5. Follow the recommendations of any individual device instructions furnished for maintenance of the device.

6. Contact ABB Service if any abnormality is experienced.

6 Renewal Parts

Order factory original replacement parts from ABB Inc., Lake Mary, Florida 32746. Specify quantity, part numbers, description, and nameplate data of the device requiring the replacement parts.

For replacement parts, call toll free: 1-800-929-SWGR.

Outside of USA call: 1-407-732-2000

7 End of life of Product

ABB products are manufactured to meet or exceed the standards of compliance for quality and environmental management systems in accordance with ISO 9001 and ISO 14001. All of these items can be supplied with a certificate of quality.

8 Methods of Disposal

Disposal can be carried out in a manner of ways depending upon material of product. Below is the recommended method of disposal for various raw materials.

The duty of ABB is to facilitate subsequent recycling or disposal at the end of product life. During disposal of the product, it is always necessary to act in accordance with local legal requirements in force.

RAW MATERIAL	RECOMMENDED METHOD OF DISPOSAL
Metal material (Fe, Cu, Al, Ag, Zn, W, ect.)	Separation and recycling
Thermoplasts	Recycling or disposal
Epoxy resin	Separation of metal and disposal of remains
Rubber	Disposal
Oil (transformer oil)	Draining and recycling or proper disposal
SF6 gas	Discharging from equipment
Packing material	Recycling or disposal

9 Disclaimer of Warranties and Limitation of Liability

DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY

There are no understandings, agreements, representations of warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose, other than those specifically set out by an existing contract between the parties. Any such contract states the entire obligation of the seller. The contents of this document shall not become part of or modify any prior or existing agreement, commitment or relationship. The information, recommendations, descriptions and safety notations in this document are based on ABB experience and judgment with respect to metal-clad and metal-enclosed switchgear. This information should not be considered to be all inclusive or covering all contingencies.

No warranties, expressed or implied, including warranties of fitness for a particular purpose or merchantability, or warranties of fitness for a particular purpose or merchantability, or warranties arising from course of dealing or usage of trade, are made regarding the information, recommendations, descriptions and safety notations contained herein. In no event will ABB be responsible to the user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss whatsoever including but not limited to damage to or loss of use of equipment, plant or power system, cost of capital, loss of profits or revenue, cost of replacement power, additional expenses in the use of existing power facilities, or claims against the user by its customers resulting from the use of information, recommendations, descriptions and safety notations contained herein.

10 ADVAC AMVAC Commissioning Checklist 1 of 2

Breaker Information

Company	_____	Date	_____
Rating	_____	Order #	_____
Serial #	_____	Cat #	_____

Receiving Inspection

- Storage & Shipping, was breaker properly stored and shipped in accordance with ABB policy
- Shipping crate is undamaged - remove crate
- Breaker is still secured to pallet - unsecure breaker
- Breaker is clean and free of moisture, corrosion and other environmental intrusions
- Breaker is undamaged - take photos, note condition in notes section
- Breaker rating label matches order, I.E. ratings, expected accessories - Is the order correct?
- Breaker indicating flags and push buttons are correct color and labeling - "OPEN" green, "CLOSE" red
- Poles have no cracks or large chips
- Primary heat sinks coating is unchipped (no bare metal) - if equipped (2000A & 3000A models)
- Primary contacts "tulips" are symmetric and complete - straighten by hand
- Primary contacts "tulips" greased at contact points - apply if needed
- Primary contacts arms are straight and show no obvious miss alignment
- Secondary plugs are undamaged and pins are fully seated and visibly straight
- Secondary locking tab is straight and undamaged
- Truck ground contact is greased - apply if needed
- Shutter rollers are clean, straight and undamaged
- Truck wheels are parallel with truck sides and rotate freely
- Wire harness - not loose or damaged
- Components - not loose or missing
- Mechanism is greased where required

Functional Test

- Breaker interlock release/truck handles operate freely – insure racking pin has dropped into place
- Racking screw release lever moves freely – make sure screw is not rotated and binding on pin
- Truck wheels are parallel with truck sides and rotate freely
- Breaker manually charges – ADVAC only
- Breaker manually closes and opens – ADVAC only
- Circuit breaker powers up and goes to "Ready" or "Charged" state in less than 8 seconds
- Breaker closes and opens locally – use pushbuttons
- Breaker closes and opens remotely – use test cabinet or switchgear
- Breaker manually opens – AMVAC only, Close breaker remove power use T-Handle if ordered
- Breaker indicators change state appropriately - "OPEN", "CLOSE", "Charged" or "Ready"
- Operational counter operates – record number of operations _____

Cell Inspection

- Modules interlock slots – unbent and rectangular
- Ground bar – visually straight and properly mounted
- Interface blocking plate – installed with appropriate rating keyed position facing up
- Secondary disconnects – locked into place and slides freely when unlocked
- Wheel rails – clean and undamaged

- Shutters – locked and covering primary stabs
- Breaker position label – intact and legible
- Compartment door – moves freely and has no difficulty securing when closed
- TOC switch – actuator arm moves inward and springs back outward
- Secondary terminals – secured and no loose wires

Cell Functional Testing

- Truck lift platform locking tab engages into cell compartment slot (see figure 13)
- Breaker interlocks fully engage module interlock slot (see figure 13)
- Circuit breaker racks in to “Test” with little resistance (<25lbs torque)
- Breaker locks into test position
- Circuit breaker operates in “Test” position (Open/Close) – both manually and remotely
- Breaker fails to close when charged and in an intermediate racking position – between “Test” and “Connect”
- Circuit breaker racks in to the “Connect” position with little resistance, increasing only within ~1 inch prior to the connect position (<50lbs torque)
- Shutter mechanism unlocks and opens – shutters unlock and begin to open between test and connect
- TOC switch – actuator arm moves inward when breaker is connected and springs back outward when breaker is racked out
- Breaker locks into connect position
- Circuit breaker operates in “Connect” position (Open/Close)
- Indicating lights operate as expected (Open/Close) – On some ABB Switchgear, the Breaker “Open” indicating light serves as both the breaker is open and that the breaker has reached either the “Test” or “Connect” position during racking. This is due to the breaker’s TOC “pin monitor” contact being in series with the breaker “Open” indicating light circuit. The pin monitor is only closed when the breaker is in one of the three racking positions “Disconnect”, “Test” and “Connect” and the racking pin has fully seated into position.
- All controls function properly
- Breaker has passed all inspection and operational testing.***

Sign and Date _____

NOTES: _____

Provide an electronic copy of the completed check list to:

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