



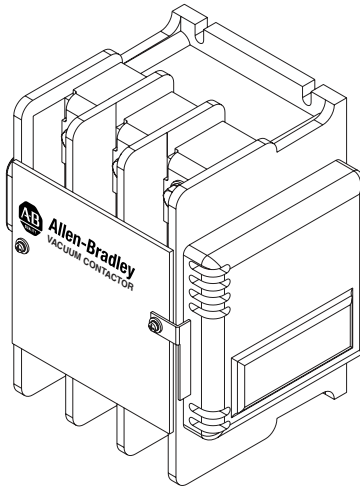
# Bulletin 1102C Vacuum Contactor Maintenance and Installation Instructions (Current Ratings 200A -- 200V-1500V)

(Cat 1102-BO\_93 -- 200A, 3 Pole Contactor - 1500V Max)



**ATTENTION:** To prevent electrical shock, disconnect from power source before installing or servicing.

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**Vacuum Contactor - 200A**

## Inspection - Unpacking

Before the contactor is placed in service, check carefully for shipping damage. Any damage should be reported to the carrier within (3) three days of receipt. For overseas deliveries, it is important to obtain a certificate of examination from the nearest insurance inspector and photographs of the damage. This and other evidence should accompany any communication to the insurance company or shippers. In the event equipment is to be returned to the factory, contact Allen-Bradley Customer Service Department or our local A-B Distributor for return authorization. A returned material authorization (RMA) number will be issued which should appear on all correspondence and the returned container.

The Bulletin 1102C Vacuum Contactor is shipped in a shock resistant filled cardboard box. The following steps should be taken when unpacking the contactor:

1. Check the packing list against the order to make sure the shipment is complete and components are received.
2. Examine the shipping box before unpacking the contactor to make sure it has not been damaged in shipment. If the shipping box is damaged, pay particular attention when unpacking to see if the contents are also damaged. Notify the carrier if damage is found and notify your local Allen-Bradley order field sales office of damage.

# Installation Instructions

The vacuum contactor may be used in any mounting plane. In any non-horizontal mounting plane, the top of the contactor should point up (so that the label appears right-side up). Care should be taken to insure that the mounting hardware does not warp the mechanism frame. If the surface of the contactor to which the contactor is mounted is twisted, shims should be used to correct the condition. Any appreciable degree of end to end twist will result in phase to phase discrepancies and timing of the main contact could cause increased pickup in control voltage values.

1. **Figure 1** illustrates the field terminals for line and load terminations. Mount the contactor with the hardware specified in **Figure 2**. Loosely install the (4) mounting bolts into the intended mounting surface. Torque the mounting bolts to 50-75 lb-inches.
2. Connect control wires to the vacuum contactor control terminals A1 and A2 located on the Control-Pak using #18 to #12 gauge 75°C stranded copper or tin stranded copper wire tightening screw terminals to 7 lb-inches torque.
3. Using 75°C wire copper cable, connect the line and load conductors to the main terminals (**Figure 1**) and proper phase rotation, tighten the main terminal bolts to 132 lb-inches torque.
4. Check all connections for accuracy and mechanical connection before energizing.

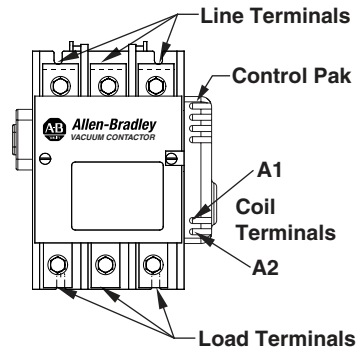


Figure 1

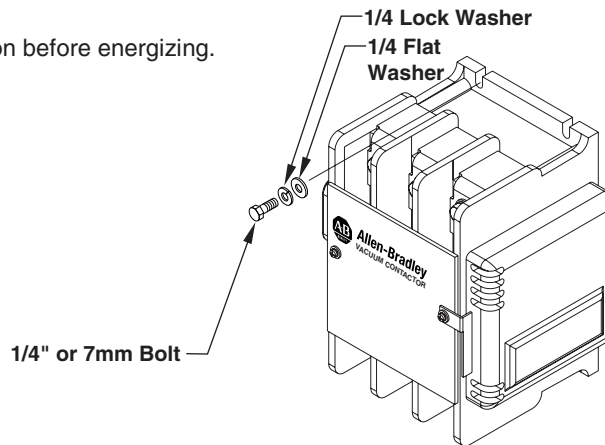


Figure 2



**ATTENTION:** If coil failure is suspected, check that secondary damage has not occurred that will render the contactor non-repairable.

## Coil Replacement Instructions

1. Disconnect all power cables (or bus work) and all control wiring to the contactor.
2. Remove the contactor from its mounted location. The contactor is best serviced in the benchtop position as shown.
3. Remove the cover attachment screws from the contactor and remove the Cover and Retainer (**Figure 3A**).
4. Disconnect the two wire leads from the Coil to the Control-Pak. Remove the Control-Pak from the contactor and set on benchtop (**Figure 3B**).
5. Remove the (6) screws that secure the Upper Housing to the Lower Housing by first removing the (4) outer screws and then (2) center screws. NOTE- Removing the center screws will release the Return Springs. Carefully remove the Upper Housing leaving the Return Springs in the Lower Housing (**Figure 3B**).

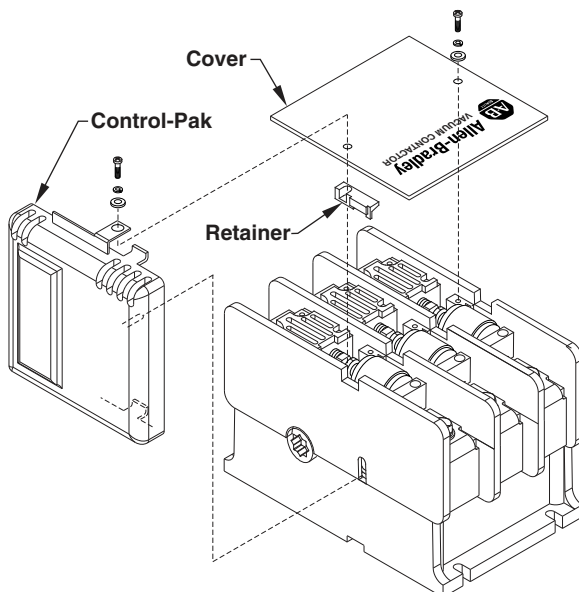


Figure 3A

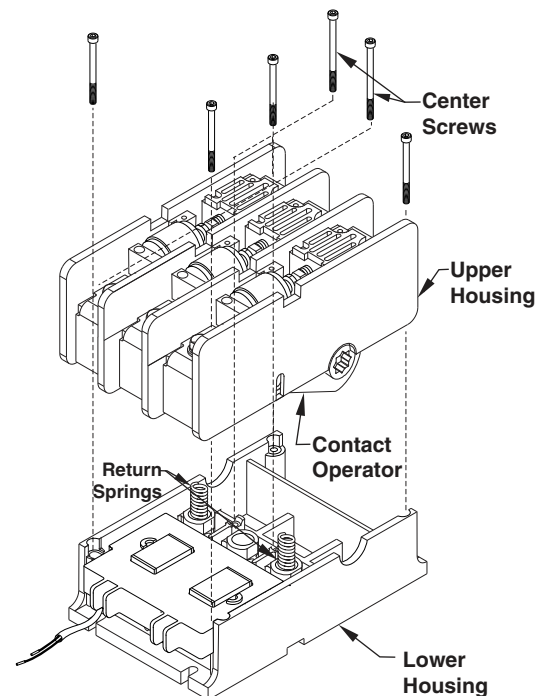


Figure 3B

## Coil Replacement Instructions (Cont'd)

6. Remove and replace the coil. Ensure that the Shim Plate remains in the proper position between the magnet core and coil (**Figure 3C**).
7. Carefully replace the Upper Housing, ensuring that it is orientated correctly and that the Return Springs are seated on the outer two bumps on the bottom of the Contact Operator (**Figure 3D**). Replace the (6) screws that secure the Upper Housing. Tighten the screws equally in a diagonal pattern approximately two turns at a time until tightened to 12 lb-inches in the same diagonal pattern (**Figure 3A**).
8. Reinstall the Control-Pak (**Figures 3E & 3F**). First, insert the lower tab into the recess on the side of the contactor base. With proper installation, the Control-Pak Actuator will fit into the hole in the slot in the side of the contactor housing. Using a thin rod or flat blade, lift the Control-Pak Actuator up as necessary to insert it into the slot mentioned.
9. Reinstall the cover with Retainer and secure it with the original mounting hardware. Tighten the four screws in a diagonal pattern to 5 lb-inches (**Figure 3A**).
10. Reattach the coil wire leads to the Control-Pak (tighten to 7 lb-inches).
11. Reinstall the device and reconnect any auxiliary control wires. Reconnect the line and load conductors and tighten the main terminal hardware and bolts to 132 lb-inches.

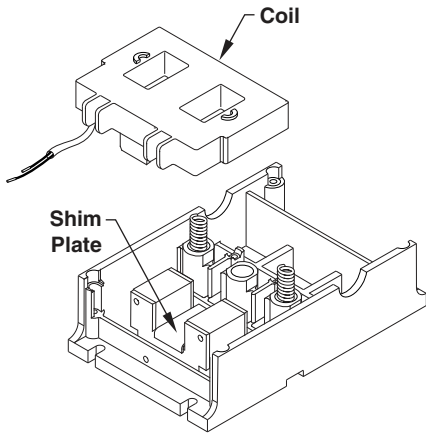


Figure 3C

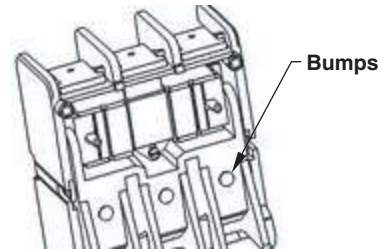


Figure 3D

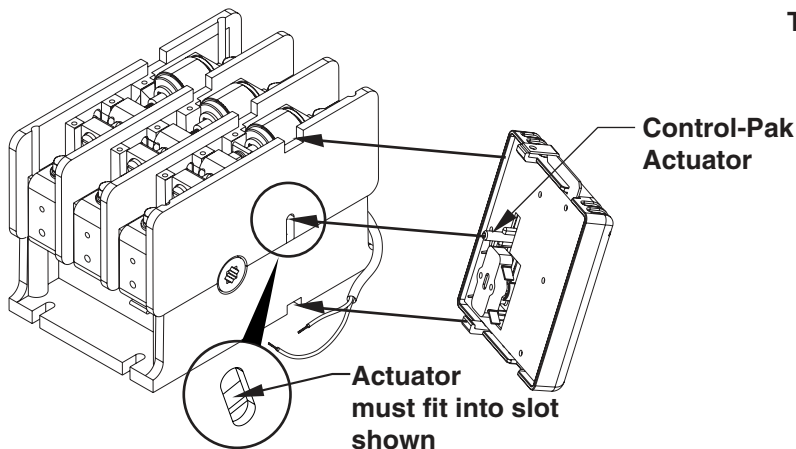


Figure 3E

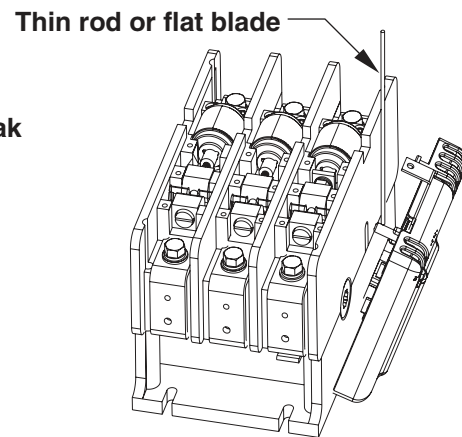


Figure 3F

## Control-Pak Replacement Instructions

1. Disconnect all control wiring to the Control-Pak.
2. Remove the cover attachment screws from the contactor and remove the cover (**Figure 3A**) page 2.
3. Remove the Control-Pak from the contactor (**Figure 3A**) page 2.
4. Reinstall the Control-Pak (**Figures 3E & 3F**). First, insert the lower tab into the recess on the side of the contactor base. With proper installation, the Control-Pak Actuator will fit into the hole in the slot in the side of the contactor housing. Using a thin rod or flat blade, lift the Control-Pak Actuator up as necessary to insert it into the slot mentioned.
5. Reinstall the cover and secure it with the original mounting hardware. Tighten the four screws in a diagonal pattern to 5 lb-inches. (**Figure 3A**).
6. Reconnect all control wiring removed per Step 1. Tighten to 7 - 9 lb-inches.

## (Auxiliary Contact Assembly) Installation Instructions

(Cat 1195C-N3 -- 2-N.O./2-N.C. - 600V @ 10A-A600)

(Cat 1195C-N4 -- 2-N.O./2-N.C. - 5V @ 10mA, DC)

(Positioned left hand side of contactor when facing front)

1. If replacing the existing 1195C Auxiliary Contact, disconnect all control wires from the auxiliary terminals.
2. Remove the cover attachment screws from the contactor and remove the cover (**Figure 3A**) page 2.
3. Install the new 1195C Auxiliary Contact (**Figures 5 and 6**). First, insert the lower tab into the recess on the side of the contactor base. With proper installation, the 1195C Auxiliary Actuator will fit into the hole in the slot in the side of the contactor housing. Using a thin rod or flat blade, lift the 1195C Auxiliary Actuator up as necessary to insert it into the slot mentioned.
4. Reinstall any Control-Pak previously removed per instructions stated above.
5. Reinstall the cover and secure it with the original mounting hardware. Tighten the four screws in a diagonal pattern to 5 lb-inches.
6. Connect all control wiring. Tighten to 7 - 9 lb-inches.

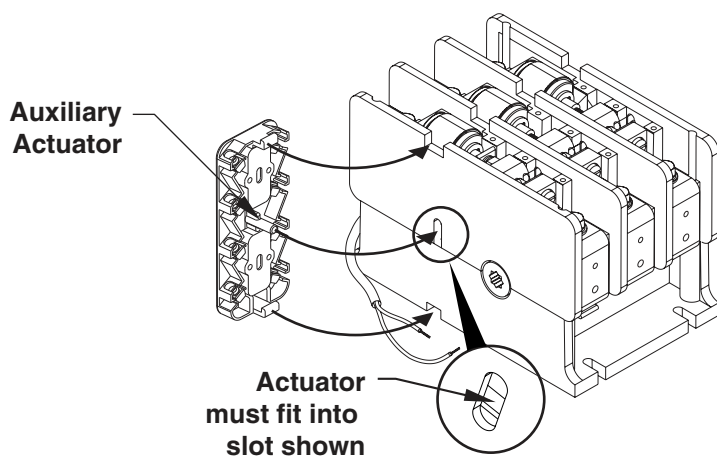


Figure 5

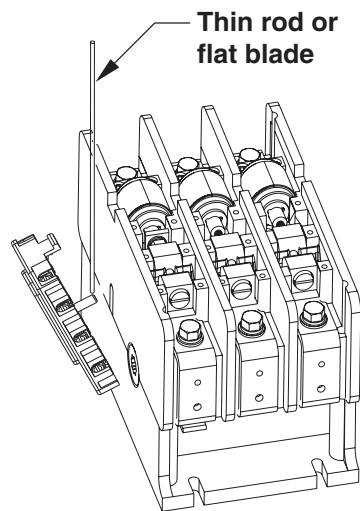


Figure 6

## Vacuum Interrupter Phase Assembly Replacement Instructions

1. Disconnect all power cables (or bus work) and all control wiring to the contactor.
2. Remove the contactor from its mounted location. The contactor is best serviced in the tabletop position.
3. Remove the cover attachment screws from the contactor and remove the cover (**Figure 3A**) page 2.
4. Disconnect the two wire leads from the coil to the Control-Pak. Remove the Control-Pak from the contactor and set on benchtop (**Figure 3B**) page 2.
5. Locate the replacement vacuum interrupter phase assembly that needs to be replaced.
6. Remove the hardware that secures the shunt to the load side terminal (**Figure 7A**). This will free the shunt.
7. For the outer interrupters, remove the Retainer. Then remove the hardware securing the Cam Cover before removing the hardware securing the Interrupter Phase Assembly. Take care to note the position of the shunt prior to removing the Interrupter Phase Assembly. (**Figure 7B**).

## Vacuum Interrupter Phase Assembly Replacement Instructions (Cont'd)

8. Place the new Interrupter Phase Assembly into the upper housing. Be sure that the Cams are properly seated around the Contact Operator. Thread the Shunt through the housing and Contact Operator, following the Shunt path (**Figure 7C**). Replace the hardware securing the Interrupter Phase Assembly (**Figure 7B**). Tighten screws to 60 - 80 lb-inches. The replacement interrupter is **factory set** for contact gap and **does not** require adjustment in the field. Attach the Shunt to the load terminal by placing the Shunt against the terminal with the flat washer and lock washer between the Shunt and the head of the bolt (**Figure 7A**) and tighten until the lock washer is fully compressed (or up to 60 lb-inches). Replace the Cam Cover and hardware (tighten to 60 - 80 lb-inches). Reinstall the Cover and secure it with the original mounting hardware. Tighten the four screws in a diagonal pattern to 5 lb-inches (**Figure 3A**). Reattach the coil wire leads to the Control-Pak (tighten to 7 - 9 lb-inches). Reinstall the device and reconnect any auxiliary control wires. Reconnect the line and load conductors and tighten the main terminal hardware and bolts to 132 lb-inches.

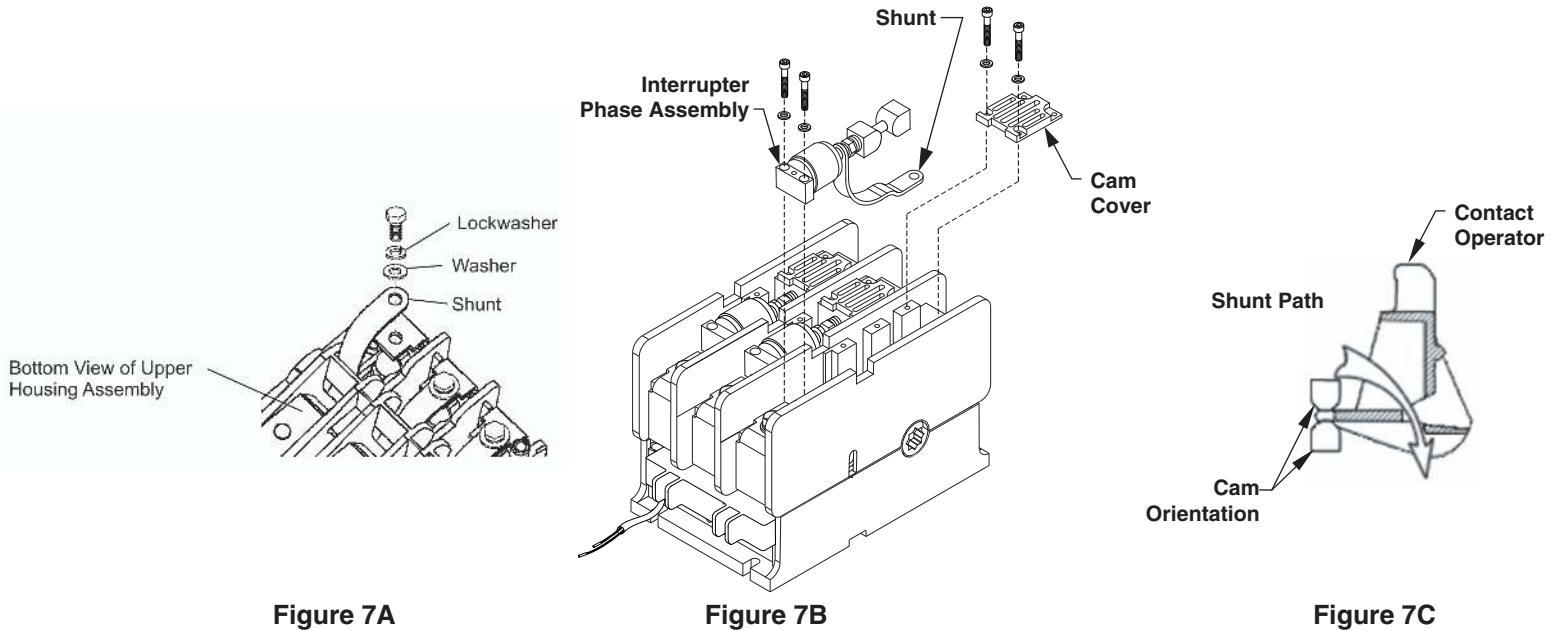


Figure 7A

Figure 7B

Figure 7C

## Contact Life Over Travel Measurement

The purpose of this measurement is to determine how much vacuum interrupter electrical life remains on the contact and is performed using a standard wire gauge in a "go, no go" check.

1. De-energize the contactor and isolate from all power sources. The control source can be maintained if coming from a separate supply or if taken from a line to line connection by application then an additional control source needs to be connected to terminals A1 and A2. Re-energize the contactor insuring that the main power circuits are open and isolated.
2. Remove Phase Cover as described (**Figure 3A**) page 2, earlier to access inspection area (**Figure 8**).
3. When the contactor is closed, a gap occurs, and this gap should accept a standard wire (.010") gauge. If the gauge can be inserted in the space then sufficient life remains for an additional 100,000 operations. Check all phases.
4. If the .010" wire gauge cannot be inserted into this gap with the contactor energized, then over travel has been exhausted and thus contact life used up. The contactor should be replaced.

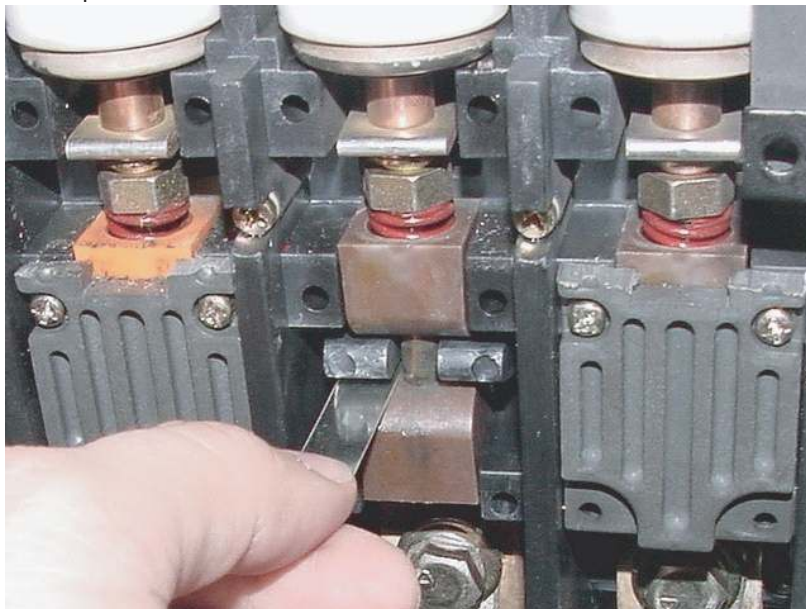


Figure 8

## Cleaning and Maintenance

1. The vacuum contactor requires no adjustment. Preventative maintenance is recommended on a routine basis, once every twelve months, dependent upon the environment that the contactor is exposed to. In general, maintenance consists of keeping the device free of dirt and dust and ensuring the power and control terminals are tight.
2. Maintenance should verify the mechanical operation of the device for freedom of movement. Clean dirt from the surfaces. Pay particular attention to molded parts and tracking surfaces. Foreign materials on these surfaces should be removed by vacuum or wiping. Do not use compressed air to remove foreign materials.

## Vacuum Interrupter Integrity Test



**ATTENTION:** Exercise caution while performing high voltage potential tests.

1. A high potential test will determine the di-electric strength and condition of the vacuum interrupter. A high potential test should be performed on each vacuum interrupter phase in sequence and should be performed approximately once every twelve months.
2. The vacuum interrupter integrity test should be performed if the contactor has been known to be exposed to fault conditions - either phase to phase or phase to ground.
3. When doing this check, make visual inspection for physical evidence of stress, distorted, discolored or cracked interrupters.
4. A contact resistance test can be done as defined below or if preferred a high potential test; di-electric test should be performed as follows.

## Contact Resistance

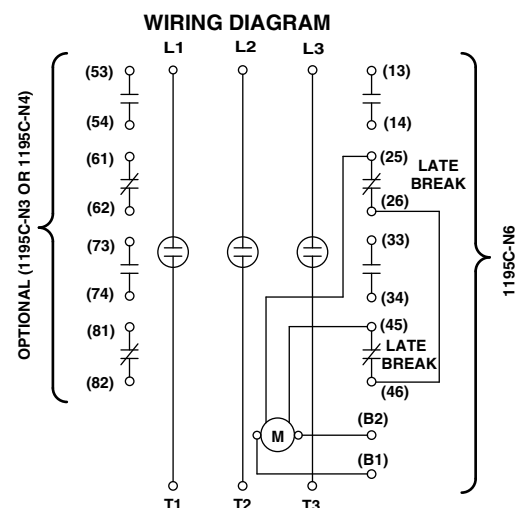
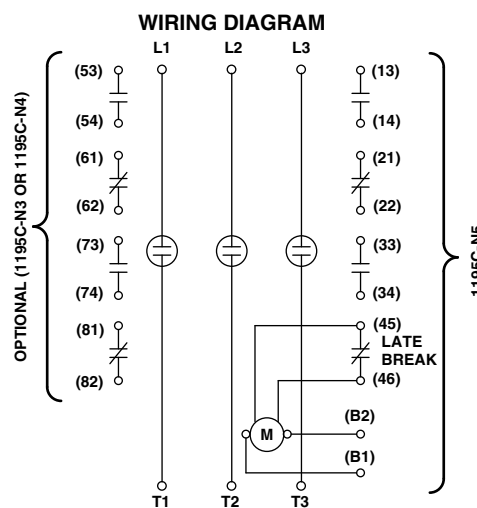
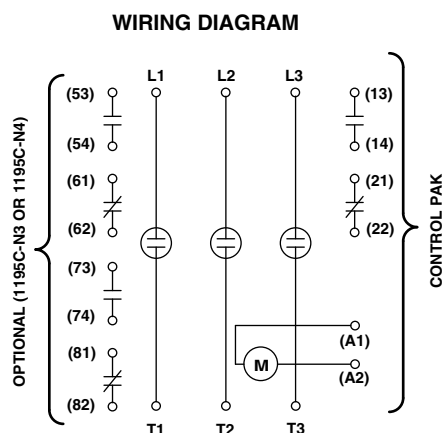
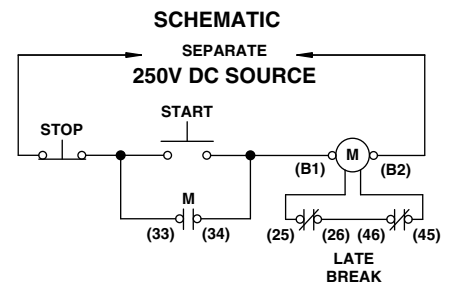
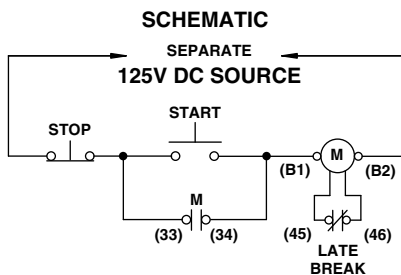
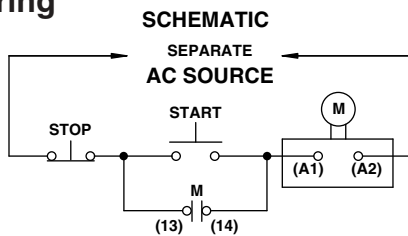
A contact resistance test can be performed using a micro-ohmmeter. This test determines the condition of contact surfaces. With the contactor closed, the resistance across the terminals should be less than 400 micro-ohms. If higher contact resistance values are measured then a high potential test should be performed, as follows:



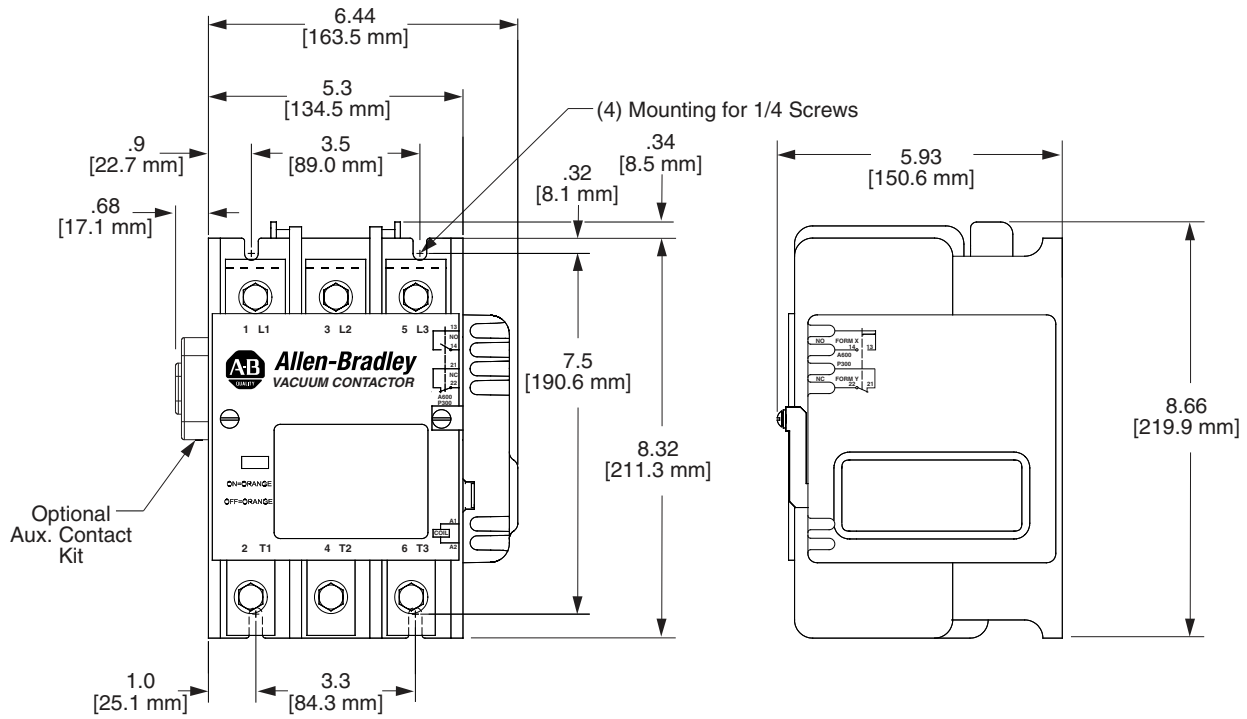
**ATTENTION:** The following test should be performed using a 50/60 Hz test set. Where the voltage is continuously variable up to at least 20 kV. X-radiation at this level is negligible. However, personnel should not be closer than ten feet to the interrupter and the test cables to avoid high voltage shock hazards. The contactor should be free of dust and other contaminants before conducting this test.

1. Disconnect the line and load conductors from the contactor.
2. Connect the leads of the test set across the interrupter terminals with the contactor in the open position.
3. Slowly raise the voltage to 10 KV and hold for 15 seconds.
4. The leakage current should not exceed 5 MA during the test and any tripping of the test set circuit protector during the test should be repeated two to three times. If it becomes impossible to reach the 10 KV level, then the interrupter needs to be replaced, and should be replaced by utilizing an Allen-Bradley replacement phase assembly kit.

## Wiring



# Dimensions



## Replacement Parts

<b>Control Pak ---- side mounted module for DC coil power</b>			
Bulletin Number	Voltage (input)	Contacteur Size	(Amp. Rating)
1102C-CP2D	110/120 VAC	1102C-BOD93	(200 Amp.)
1102C-CP2A	220/240 VAC	1102C-BOA93	(200 Amp.)
1102C-CP2N	380/415 VAC	1102C-BON93	(200 Amp.)
1102C-CP2B	440/480 VAC	1102D-BOB93	(200 Amp.)

**Coil Kit ---- This kit contains the DC coil mounted in the sheet metal frame assembly which attaches to the contactor mounting plate.**

**NOTE: When changing the coil voltage, verify that the Control-Pak voltage for the coil kits listed below is in agreement with the Control-Pak nameplate input voltage.**

Bulletin Number	Voltage (input)	Control Pak Volts	(Amp. Rating)
1102C-PK2D	108 VDC	110/120 VAC	(200 Amp.)
1102C-PK2A	108 VDC	220/240 VAC	
1102C-PK2N	108 VDC	380/415 VAC	
1102C-PK2B	108 VDC	440/480 VAC	
1102C-PK2G	125 VDC	NONE	(200 Amp.)
1102C-PK2H	250VDC	NONE	

<b>Interrupter Phase Assembly Kit - Replacement for One Vacuum Interrupter Phase</b>	
Bulletin Number	Current Rating of Interrupter
1102C-VB2	200 A Vacuum Interrupter Phase Assembly

## Accessories

<b>Auxiliary Kits</b>	
Bulletin Number	Type - Contact Arrangement
1195C-N3	(2) N.O. / N.C. 600 VAC 10 Amp. (A600)
1195C-N4	(2) N.O. / N.C. 5 VDC 10mA
1195C-N5	For use on DC input coils only - 125 VDC maximum (1) N.O. / N.C. & (1) N.O. /Late Break N.C.
1195C-N6	For use on DC input coils only - 250 VDC maximum (2) N.O. / Late Break N.C.

<b>Lug Kits</b>	
Bulletin Number	Current Rating W/ Wire Gauge Range
1195C-LK1	200 A 2/0 - 250 MCM