



MOTORTRONICS™

Solid State AC Motor Control

Medium Voltage Vacuum Contactor

7.2kV / 400A



Instruction Manual

NOTICE

READ AND UNDERSTAND THESE INSTRUCTIONS BEFORE ATTEMPTING ANY UNPACKING, ASSEMBLY, OPERATION OR MAINTENANCE OF THE CIRCUIT BREAKER. THIS INSTRUCTION MANUAL SHOULD BE APPLIED ONLY TO U-SERIES VACUUM CONTACTORS. THIS INSTRUCTION MANUAL DOES NOT INCLUDE ALL ITEMS REGARDING INSTALLATION AND MAINTENANCE PROCEDURES. FOR MORE INFORMATION, PLEASE CONTACT US.

Safety Practices

This instruction manual applies only to the MVF Series Vacuum Contactor regarding installation and maintenance procedures.

Installing and maintaining these products improperly may result in serious personal injury, property damage, or even death. Therefore this instruction manual must be read and understood at every step in unpacking, assembly, operation, and maintenance of contactors.




Only qualified persons familiar with installing and maintaining contactors are permitted to work on contactors, and this instruction manual should be accessible to those persons at all times.

If further information is required, please contact Motortronics Inc.


Labels

Labels used in this instruction manual are DANGER, WARNING and CAUTION depending on the situation.


Safety Practices during Operation


| | |
|--|---|
|  DANGER | Indicates an imminently hazardous point which, if ignored, will result in death or serious injury. |
|  WARNING | Indicates a potentially hazardous point which, if ignored, could result in death or serious injury. |
|  CAUTION | Indicates a potentially hazardous point which, if ignored, may result in minor or moderate injury. This signal also warns operators to work safely. |


Safety Practices during Installation


| | |
|--|--|
|  CAUTION | <ul style="list-style-type: none">• Excessive heavy weight could cause serious personal injury, or damage. To avoid this situation, please don't hand carry a contactor or transport using a lifting device in the overhead position.• Do not work on contactors unless the primary circuits are disconnected by a visible air gap disconnect or other suitable disconnecting means and grounded.• When connecting bus-bars, tighten bolts according to then manual values.• Contactors should be tightly mounted on a horizontal plane.• Do not install the contactors in areas with high temperature, high humidity, dust, corrosive, or vibrating conditions.• Concrete dust or any other dust should not be inside the product when it installed. It can cause fire or incorrect operation. |
|--|--|

Safety Practices during Operation

| | |
|---|--|
|  DANGER | Do not touch the primary circuit or the control circuit. |
|---|--|

| | |
|--|---|
|  WARNING | Do not insert or drawout the contactor in the closed condition. |
|--|---|

| | |
|--|---|
|  CAUTION | Do not leave contactors in an intermediate position. Always place the contactor in the test or connection position. |
|--|---|

| | |
|---|--|
|  WARNING | <ul style="list-style-type: none">• Do not work on contactors unless the primary circuits are disconnected a visible air gap disconnect or other suitable disconnect and the contactor terminals are grounded.• Replace the vacuum interrupter when the wipe is below .02 inches. (0.5mm) |
|---|--|


| | |
|--|--|
|  CAUTION | <ul style="list-style-type: none">• Failure to correctly maintain the equipment could result in serious injury and product failure and can prevent successful functioning of connected apparatus.• Do not work on contactors with power being supplied to the control circuit.• Do not leave maintenance tools near the contactor.• Do not work on closed contactors.• Be sure that bolts are tightened according this manual after replacement and check the tightness periodically.• The replacement of vacuum interrupter shall affect the performance of contactor, consult factory before replacement.• Note and check the relationship between each wire and its associated auxiliary switch terminal. |
|--|--|

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1. General

The MVF Series of Vacuum Contactors are suitable for switching and controlling 3-phase motors with squirrel cage or slip ring rotor, capacitors, and transformers. These are designed and manufactured to withstand frequent switching.

1.1 Specification

| Rated voltage | Rated current | Power frequency withstand voltage | BIL | Interrupting rating | Category | Operating cycle |
|---------------|---------------|-----------------------------------|------|---------------------|----------|----------------------|
| 7.2kV | 200A, 400A | 20kV | 60kV | 4kA (50 MVA) | AC3 | 1200 operations/hour |

1.2 Operation Time & Current

| | Control Voltage | Closing current (A) | Holding current (A) | Opening current (A) | Closing time (ms) | Opening time (ms) |
|-----------------------------|-----------------|---------------------|---------------------|---------------------|-------------------|-------------------|
| Continuously energized type | 110 VDC | 2.5 | 1.0 | N/A | 80 Max. | 40 Max. |
| | 220 VDC | 1.6 | 0.7 | N/A | | |
| | 110 VAC | 2.0 | 0.8 | N/A | 80 Max. | |
| | 220 VAC | 1.0 | 0.5 | N/A | | |
| Latched type | 110 VDC | 2.7 | N/A | 5.0 | 120 Max. | 25 Max. |
| | 220 VDC | 1.7 | N/A | 4.0 | | |
| | 110 VAC | 1.9 | N/A | 3.5 | 120 Max. | |
| | 220 VAC | 1.2 | N/A | 3.0 | | |

1.3 Control Voltage Range

- 1) Closing: 85-110% of rated voltage
- 2) Opening: 70-110% of rated voltage (latching type only)

1.4 Rated Current of Auxiliary Contact

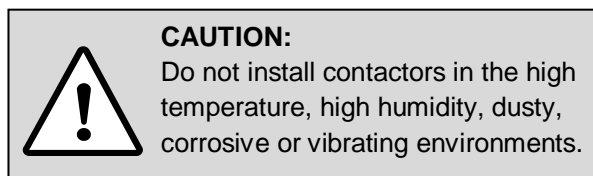
| Voltage | Rated current |
|---------|---------------|
| AC110V | 5A |
| AC220V | 2A |

1.5 Additional Ratings

| Drop-out control voltage | Chopping current |
|--------------------------|------------------|
| AC/DC25V | 1A |

1.6 Application Condition

- 1) Ambient temperature: -5°C to 40°C (23°F to 104°F)
- 2) Relative humidity: below 85%
- 3) Altitude: less than 1000m (3281ft) A.S.L (Above Sea Level)



Please contact us for the special applications.

1.7 Ordering System

| Non-Latching Model Number | Rated Voltage | Rated Current (Amps) | Configuration |
|----------------------------------|----------------------|-----------------------------|---|
| 34-72-4-C-X-0-3-0-12 | 7.2kV | 400A | Fixed Mount, Dbl Terminal w/o counter, non-fused, 120VAC control. |
| 34-72-4-C-B-F1-0-12 | 7.2kV | 400A | Draw-out, Compartment Style, non-fused, 120VAC control. |
| Latching Model Number | Rated Voltage | Rated Current (Amps) | Configuration |
| 34-72-4-L-X-0-3-0-12 | 7.2kV | 400A | Fixed Mount, Dbl Terminal w/o counter, non-fused, 120VAC control. |
| 34-72-4-L-B-F1-0-12 | 7.2kV | 400A | Draw-out, Compartment Style, non-fused, 120VAC control. |

1.8 Application Considerations

- 1) Verify the voltage and current requirements of the load are within the specified ratings of the contactor.
- 2) The vacuum interrupter should be replaced after 1,000,000 operations. If the contactor is not protected by fuses, the vacuum interrupter should be replaced if they have interrupted fault currents at or near their maximum interrupting rating.

2. Receiving/Handling/Storage and Installation

MVF Series Vacuum Contactors are subjected to complete factory production tests and inspection before packing. They are shipped in packages designed to provide maximum protection to the equipment during shipment and storage.



CAUTION:

Excessive weight can cause serious injury or damage. To avoid this situation, Do NOT hand carry a contactor or transport using on a lifting device in the overhead position.

2.1 Receiving

When contactors are delivered, receivers should examine the contents for any signs of damage such as broken, missing, or loose components. If damage or loss is detected, notify our nearest office or representatives and file a claim with the freight carrier.

Inspection after unpacking:

- 1) Check the type rating and quantities with the specification sheet.
- 2) Check contactors for any damage or missing materials.
- 3) Check all the accessories and spares supplied.

2.2 Handling

Contactors must be handled with care to avoid damage. Ensure that vacuum contactors do not suffer impact or other physical stress during handling. Contactor damage may cause serious harm to both persons and property.

2.3 Storage

Store contactors in a dry, dust free, and well ventilated room. Contactors should be stored in the open condition.



CAUTION:

Concrete dust or any other dust inside the contactor may cause fire or damage to the contactor.

2.4 Installation

- 1) Confirm the type and rating, check for damage, and clean contactors with a dry cloth, before installing contactors into the switchgear.
- 2) Mount contactors securely on a flat surface. Refer to section 6 of this manual for dimensions and section 2.6 for torque requirements.
- 3) Clean the connecting surfaces with a dry cloth, and then connect the 3 phase cables/ buses and earth terminals. Be careful not to impact the enclosure-or contactor with the cables or bus.



CAUTION:

- Do not work on contactors unless the primary circuit is disconnected by the visible breaker and the contactor terminals are grounded.
- When connecting bus-bars, tighten bolts per the manual requirements.
- Contactors are only mounted on the vertical or horizontal plane tightly.

2.5 Inspection before Operation

- 1) Confirm contactors are installed properly. If not, install contactors again according to section 2.4.
- 2) Operate contactors a few times manually to ensure that contactors close and open smoothly. Then, operate contactors electrically in the test position, and confirm that the ON/OFF indicator works properly.
- 3) Confirm that no tools and materials are left near the contactor.

2.6 Tightening Torque for Bolts

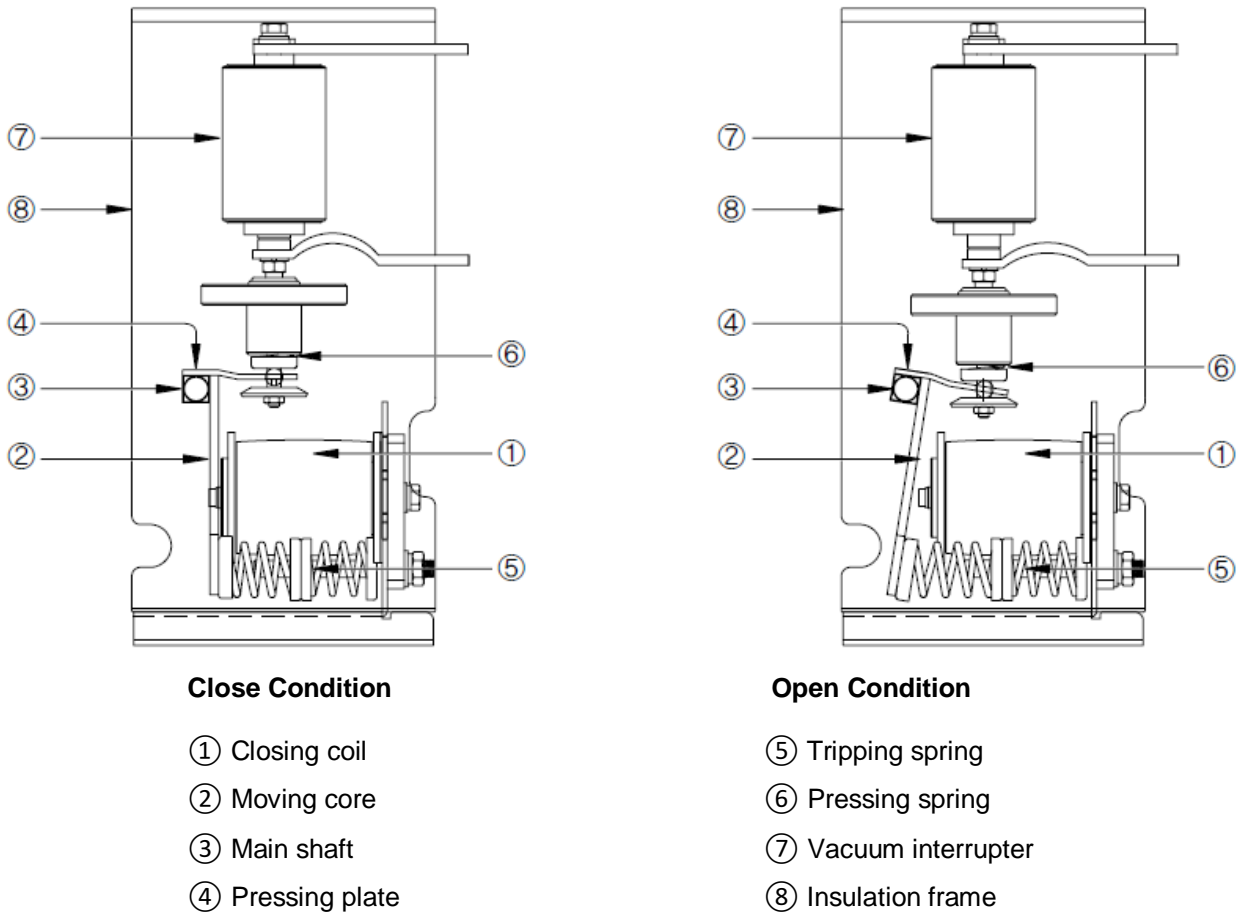
| Bolt Size | inch pounds | Nm | kgf cm |
|-----------|-------------|------|--------|
| M6 | 42.5 | 4.8 | 49 |
| M8 | 106 | 12 | 122 |
| M10 | 213 | 24 | 245 |
| M12 | 373 | 42.2 | 430 |

3. Structure and Explanation of Operation

3.1 Structure

Fig. 3-1 is the section-drawing of the mechanism part in the MVF Series Vacuum Contactor.

Fig. 3-1



3.2 Explanation of Operation

1) Closing

■ When the closing coil ① is energized, the moving core ② moves toward the closing coil and compresses the opening spring ⑤. At the same time, the pressing plate ④, which is fixed on the main shaft ③, pushes the pressing spring ⑥, so the movable stem of the vacuum interrupter ⑦ is moved up to make the CLOSED condition.

■ For latched type (mechanical latching), the latch device holds the moving core of the contactor closed against the closing coil after the contactor is energized (closed) and the control source is removed.

2) Opening

■ For continuously energized types, if the closing coil is de-energized by the OFF signal and the opening spring is released to the OPEN condition, then opening of the contactor is completed.

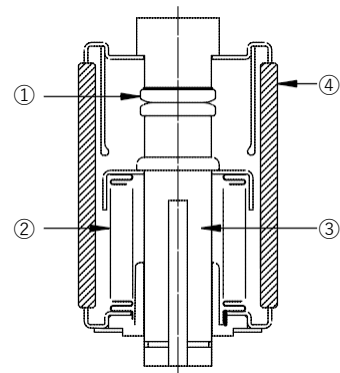
■ For latched type, if the trip coil is energized by OFF signal or the trip button is pushed, the hook roller of the latch device is released and the moving core moves to OPEN condition by the opening spring.

3.3 Structure of the Vacuum Interrupter

The vacuum interrupter has the contact stem ③, the contacts ①, the bellows ②, and the ceramic insulator ④.

The contact is designed to guarantee 1 million operations and to restrain the transient recovery voltage under 1A chopping current.

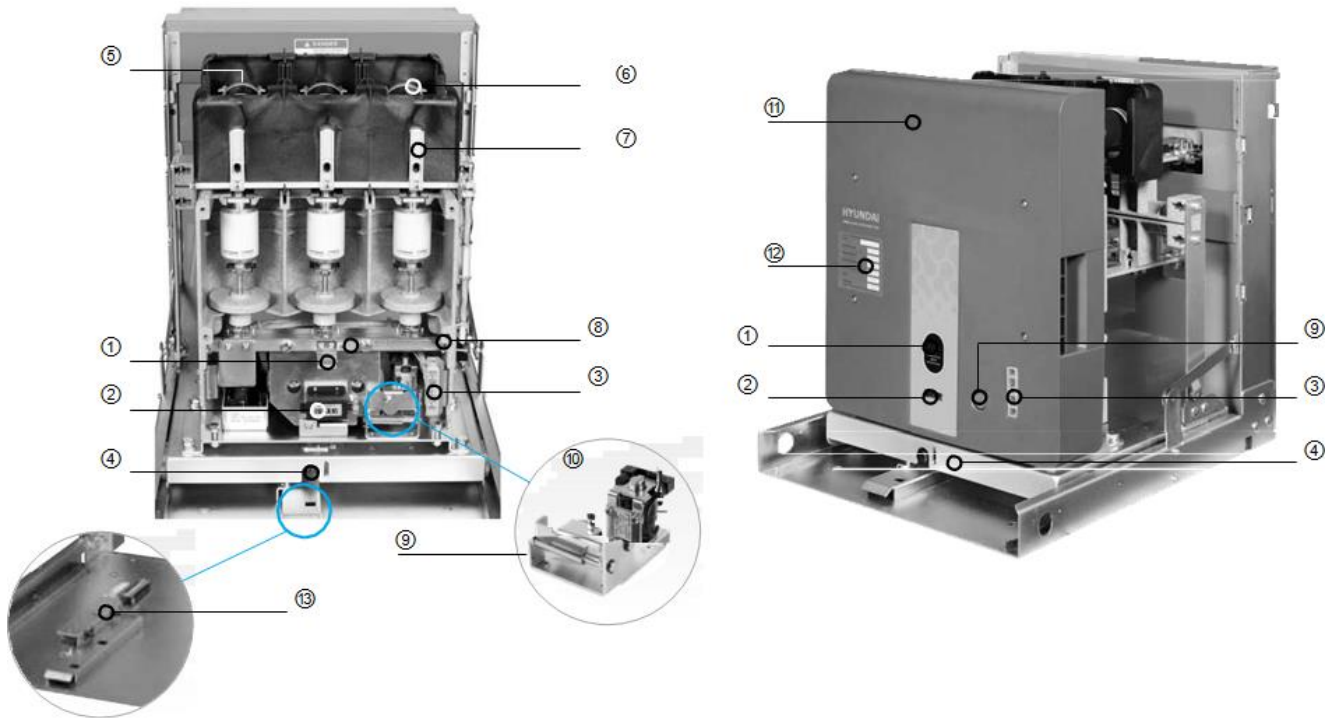
The low pressure in the vacuum interrupter is guaranteed for over 30 years of service, so the vacuum interrupter is maintenance-free. But if necessary, it can be checked a vacuum tester.



3.4 Structure of Cradle Type and Interlock

1) Structure of cradle type

Fig. 3-3 is the cradle type of MVF Series Vacuum Contactor.

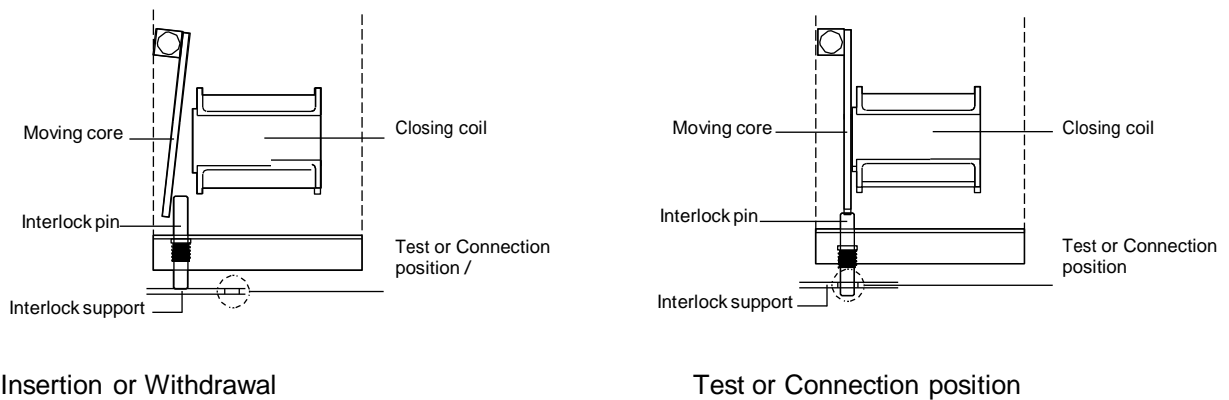


- ① ON/OFF indicator, ON means closed condition, OFF means open condition.
- ② Counter, The counter (when present) shows how many times the contactor has operated since it was made.
The counter may read 100 when you receive the contactor, because it was tested after manufacturing.
- ③ Control plug. The control source is supplied through the control Jack.
- ④ Draw-out button
- ⑤ Fuse. Fuses prevent the magnification of the short-circuit current.
- ⑥ Fuse holder
- ⑦ Fuse melting detector. The fuse melting detector can show electrically whether the fuse has blown or not.
- ⑧ Manual checking hole. A manual checking hole is used to close the contactor manually.
- ⑨ Emergency trip button. Only the latched types have the trip button which is used in emergencies.
- ⑩ Latch device
- ⑪ Front cover
- ⑫ Name plate
- ⑬ Position switch. The position switch indicates electrically whether the contactor is in the TEST or CONNECTION position.

2) Interlock

| No. | Interlock condition | Interlock action | Interlock release | Remark |
|-----|--|---|--|----------|
| 1 | If the contactor is closed, it cannot insert and withdraw in the TEST and CONNECTION position. | The interlock pin, attached in frame inside, prevents the contactor from inserting mechanically. | Open the contactor. | Standard |
| 2 | The contactor cannot be closed during the process of inserting and withdrawing. | The interlock pin prevents the closing mechanically. | Move the contactor to TEST or CONNECTION position, and then close the contactor. | Standard |
| | | The auxiliary switch cuts off the control source during insertion or withdrawal. (electrical interlock) | | Option |

Fig. 3-4



3.5 Inserting & Withdrawing

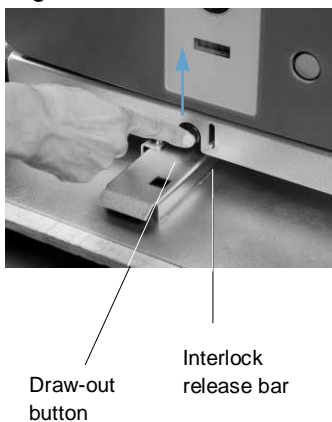
1) How to insert the contactor in the E, F cradle.

■ Inserting

Set the wheels of the contactor exactly on the guide rail of the cradle. The lifter should be used when the contactor is lifted in order to install it into switchgears.


When the contactor reaches the **TEST** position, the interlock pin prevents the draw-in at this position. Push the draw-out button (Fig. 3-5) and then insert the contactor to the **CONNECTION** position. If the contactor is in the correct position, the interlock pin is in the hole on the interlock support and the female contact will be inserted fully into the terminal.


Fig. 3.5




■ Withdrawing

When a contactor is withdrawn, the contactor cannot be operated because of the interlock. In OPEN condition, push the draw-out button (Fig. 3-5) and pull out a contactor to the TEST position.

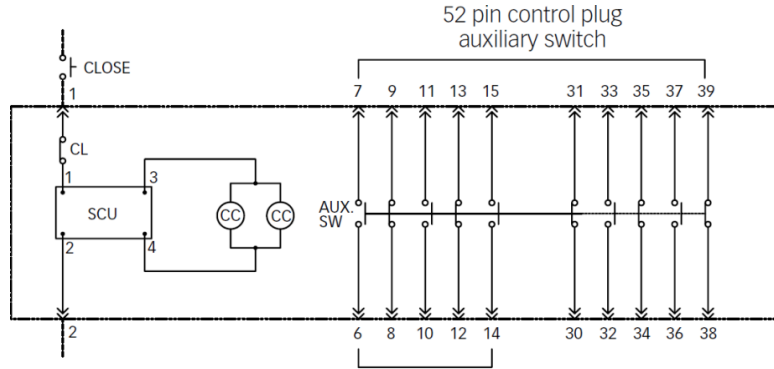
| | |
|---|--|
|  DANGER | Do not touch the primary circuit or the control circuit. |
|---|--|

| | |
|--|---|
|  WARNING | Do not insert or drawout the contactor in the closed condition. |
|--|---|

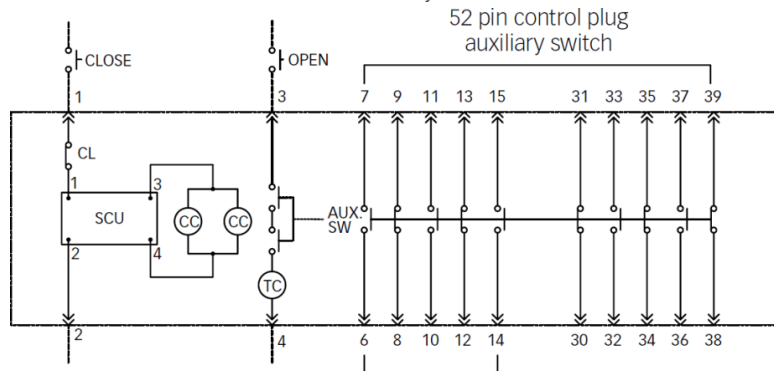
| | |
|--|---|
|  CAUTION | Do not leave contactors in an intermediate position. Always place the contactor in the test or connection position. |
|--|---|

3.6 Control Circuit Diagrams

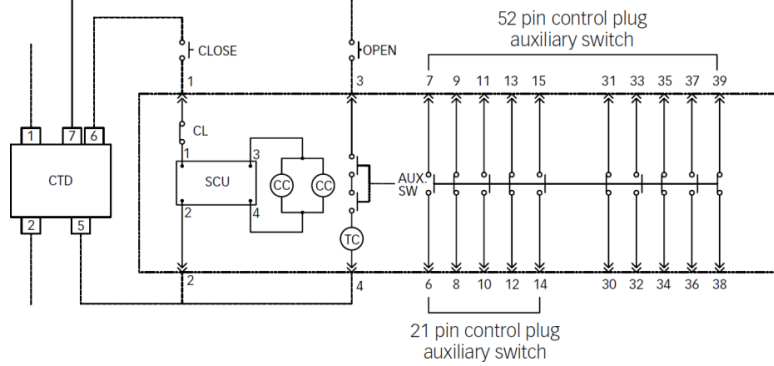
Continuously Energized



Latched



Latched (AC Open Control)





CC: Closing coil
TC: Trip coil


SCU: Source control unit
CL: Electrical interlock

CTD: Condenser trip device
Aux. SW: Auxiliary switch


4. Inspection and Maintenance

| | |
|---|--|
|  DANGER | Do not touch the primary circuit or the control circuit. |
|---|--|

| | |
|--|---|
|  WARNING | Do not insert or drawout the contactor in the closed condition. |
|--|---|

| | |
|--|---|
|  CAUTION | Do not leave contactors in an intermediate position. Always place the contactor in the test or connection position. |
|--|---|

Maintenance shall be carried out to ensure trouble-free operation and achieve the longest possible working life of the contactors. MVF Series Vacuum Contactors are characterized by their simple and robust construction and have a long life expectancy. Their operating mechanisms have a low maintenance requirement, and the interrupters are maintenance-free during their working life. The maintenance is determined by environmental influences, switching frequency, and so on.

| | |
|--|---|
|  CAUTION | <p>Failure to maintain the equipment could result in serious injury and product failure and can prevent successful functioning of connected apparatus.</p> <p>Do not work on contactors with power being supplied to the control circuit. Do not leave maintenance tools near the contactor.</p> <p>Do not work on closed contactors.</p> <p>Be sure that bolts are tightened to the required torque value (see section 2.6) after replacement and check the tightness regularly.</p> |
|--|---|

4.1 Visual Inspection (every 1-6 months)

The purpose of the visual inspection is to confirm normal operation and should be performed every 1 to 6 months depending on duty service.

| No. | Items | Procedure of checking |
|-----|------------------|---|
| 1 | ON/OFF indicator | Check if each state of ON/OFF is identified accurately. |
| 2 | Abnormal smell | Check if the closing coil is overheated or burned. |
| 3 | Damage | Check for cracks, breaks, and discoloration. |

4.2 Periodic Inspection

| Object | Items | Standard interval | Check procedure |
|----------------------------------|----------------------|----------------------------|---|
| Main body | Insulation | 3 years | <ul style="list-style-type: none"> Clean and dry when the dust or humidity is extreme. |
| | Overall | 6 years | <ul style="list-style-type: none"> If a component is badly damaged, replace it. |
| Fuse | Fuse | 3 years, or fuse is blown. | <ul style="list-style-type: none"> Check if the strike pin of fuse is out If a fuse is blown, all 3 phases should be replaced at the same time. |
| | Fuse blown indicator | 3 years | <ul style="list-style-type: none"> Check if the fuse blown indicator operates smoothly. If not, put the grease on the moving parts. |
| Vacuum interrupter | Contact wear | 3 years, per 5000 cycles | <ul style="list-style-type: none"> Check if the contact erosion is out of spec. If it is all 3 vacuum bottles should be replaced at the same time. |
| | Pressure | 3 years | <ul style="list-style-type: none"> Check vacuum by using the vacuum tester. |
| Open and close mechanism | Tightness | 1 years | <ul style="list-style-type: none"> Check and tighten bolts. |
| | Spring | 3 years | <ul style="list-style-type: none"> Check for scratches or rust. |
| | Closing coil | 3 years | <ul style="list-style-type: none"> If the coil is discolored, replace it. Check and tighten bolts. Check operation at 85-110% of rating. |
| Latch mechanism | Hook roller | 3 years | <ul style="list-style-type: none"> Check for scratches or rust. Put grease on the moving parts. The gap between the roller and the operating plate should be 0.2-0.5 mm. If not, replace the Latch Device. |
| | Trip Coil | 3 years | <ul style="list-style-type: none"> If coil is discolored, replace it. One should be operated at 85-110% of rating. |
| Auxiliary switch, closing switch | Switch | 3 years | <ul style="list-style-type: none"> The resistance of contact of auxiliary switch should be below 200 mΩ. If not, clean the contact. The connection plug is completely inserted. |
| | Wiring | | |
| Inserting mechanism | Isolating Contact | 3 years | <ul style="list-style-type: none"> Put grease on the moving parts. The female contact should be inserted above 10 mm. |
| | Interlock mechanism | 3 years | <ul style="list-style-type: none"> Check if it moves smoothly. |
| Insulation resistance | Main conductor | 3 years | <ul style="list-style-type: none"> Above 1000 MΩ between electrodes, and earth (gnd). |
| | Control circuit | 3 years | <ul style="list-style-type: none"> Above 2 MΩ between the control connections and earth (gnd). |

4.3 Checking Vacuum and the Contact Erosion Limit

1) Checking the vacuum

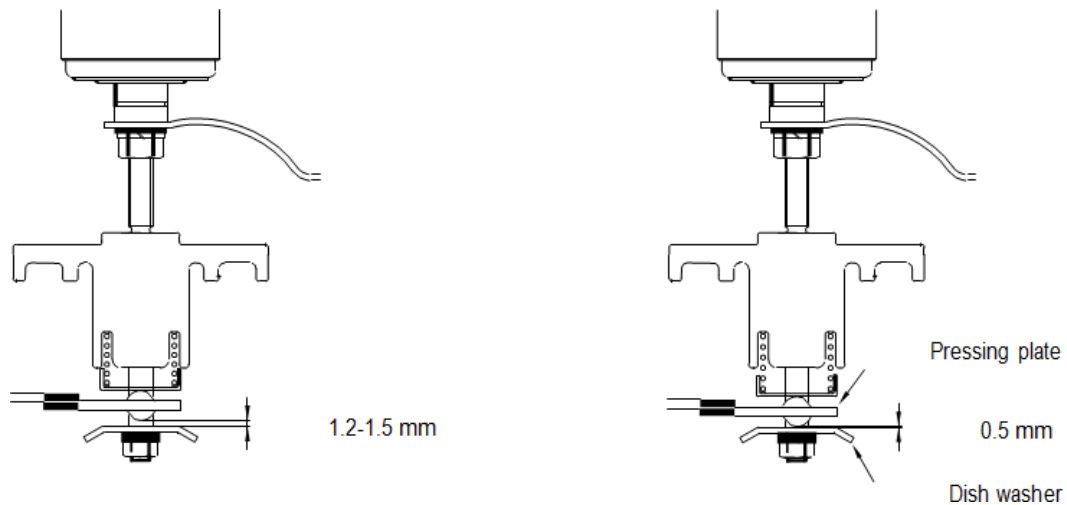
The low pressure in the vacuum interrupter is guaranteed for over 30 years of service. That means the vacuum interrupter is maintenance-free. But if necessary, it can be checked by a vacuum tester.


2) Checking the contact erosion

Since the contacts are contained inside the interrupter, they remain clean and require no maintenance. However, during high current interrupting, there may be a minimum amount of erosion from the contact surfaces. To check the erosion of the interrupter contacts and carry out the following operations.

- Close the contactor.
- Open the rear cover (if the contactor has a rear cover).
- Measure the distance between the dish washer and the pressing plate. With new interrupters this distance is about 0.047 – 0.059 inches (1.2-1.5 mm). If it is reduced to 0.020 inches (0.5 mm), the three interrupters must be replaced. Checking the contact erosion is important to evaluate the efficiency of the interrupters. (Refer to the Fig. 4-1)

Fig. 4.1



| | |
|--|---|
|  WARNING | Replace the vacuum interrupter when the wipe is below 0.02 inches (0.5 mm). |
|--|---|

4.4 Replacements for Main Components

Remove the contactor from the enclosure to ensure that all high voltage sources are disconnected.

1) Replacing the fuse

- Renew the fuses. The fuse must have the striker facing towards the front cover.
- If new fuses are longer than old ones, rear fuse holders can move 100 mm backward. Insert new fuses and tighten the bolts.
- Reverse the action in the previous step if the new fuses are shorter.

Fig. 4.2 Replacing the fuse

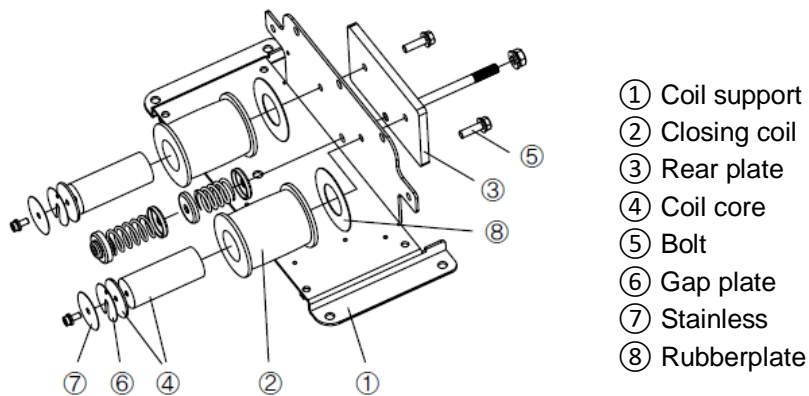


2) Replacing the closing coil

The contactor employs a pair of magnet coil for each contactor.

- Remove the moving core. (Fig. 3-1 ②)
- Remove the rear cover.
- Pull out control plug of the closing coil ②.
- Loosen the bolts ⑤, fixing the closing coil.
- Remove the failed coils out toward the front cover.
- Insert the new coils.
- Connect the leads of the closing coil.
- Reinstall the moving core and rear cover.
- After reassembling, check the operation of the contactor electrically.

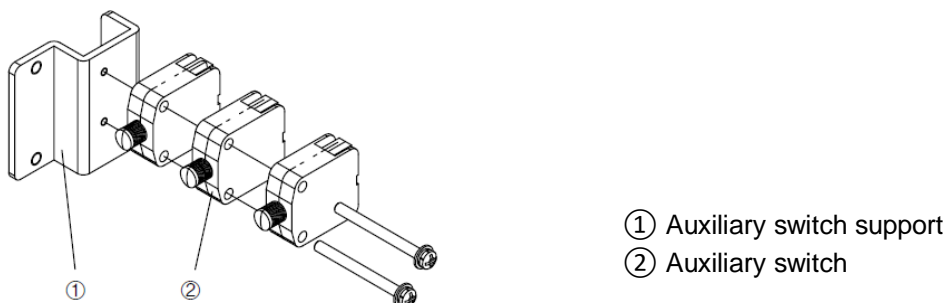
Fig. 4-3



3) Replacing the auxiliary switch

- Release the support ① and remove the wires from the auxiliary switch.
- If auxiliary switch ② needs replacing, release the bolt and cable.
- Replace the failed auxiliary switch.
- Reverse the action in the previous step and check the operation of the switch manually using the manual checking hole. (Fig. 3-3 ⑧)
- Check the operation of the switch electrically.

Fig. 4-4





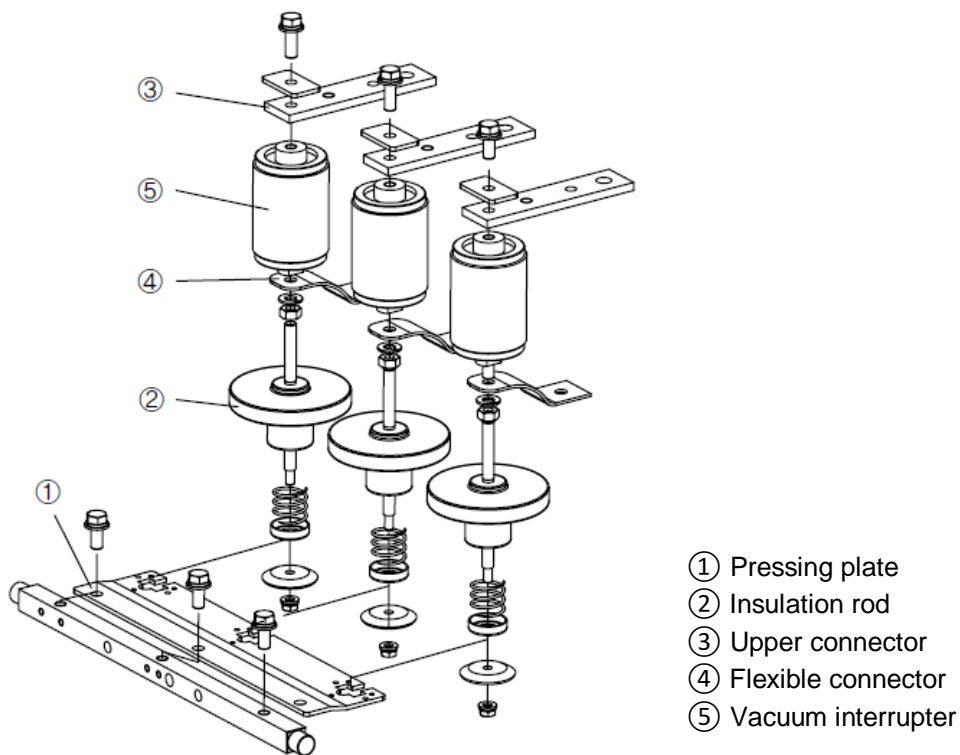
CAUTION

Note and check the relationship between each wire and its associated Auxiliary Switch terminal.

4) Replacing the vacuum interrupter

- Release the pressing plate.
- Release the Insulation rod ② from the vacuum Interrupter ⑤, and separate the flexible connector ④.
- Loosen the upper fixing bolts from the upper connector ③.
- Replace the new vacuum interrupter ⑤.
- Reverse the action in the previous step and check the stroke and wipe of the vacuum interrupter.

Fig. 4-5



CAUTION

The replacement of vacuum interrupter shall effect the performance of contactor, so consult with us before replacement.

5) Replacing the source control unit

- Open the rear cover (if the contactor has a rear cover).
- Remove the cable tie.
- Pull out (disconnect) the control plug. (Fig. 4-6)
- Release the fixing bolt. (Fig. 4-7)
- Replace the control unit. (Fig. 4-8)
- Reassemble reversely.

Fig. 4-6

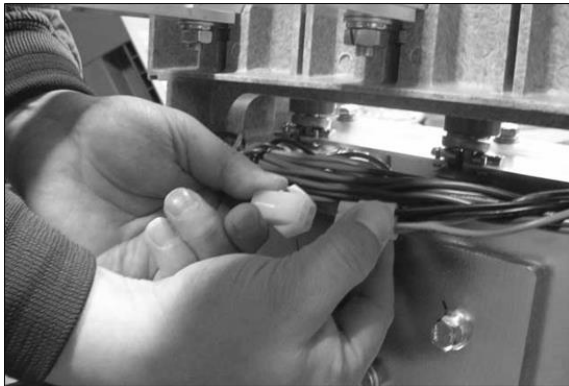
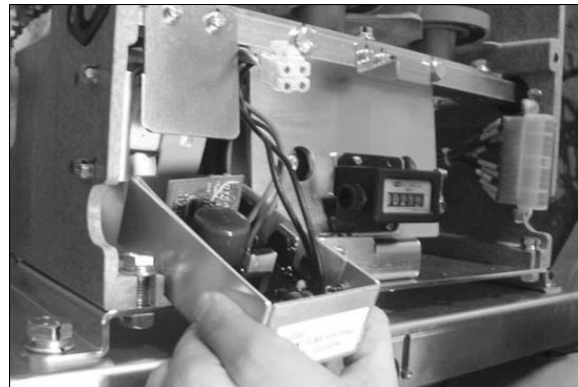


Fig. 4-7



Fig. 4-8



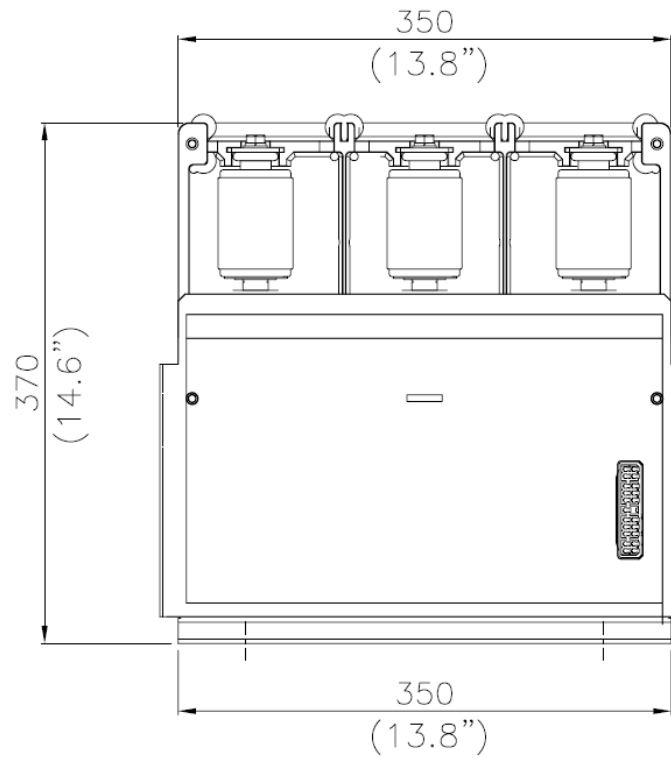
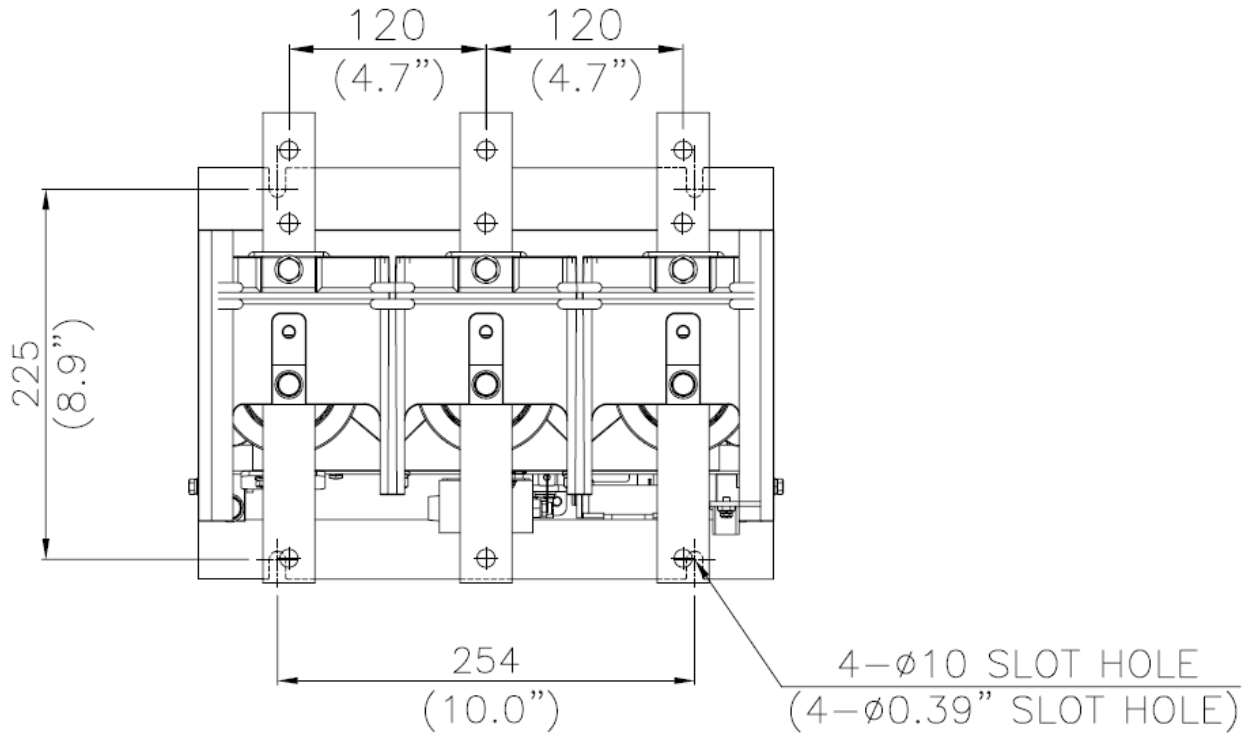
4.5 Troubleshooting

| Does not close | | | | | |
|-------------------------------------|-----------------------|-----------------------|-----------------------|---|--|
| Does not open | | | | | |
| Latching motion / latch | | | | | |
| Burnt coil of closing electromagnet | | | | | |
| Surface flashover | | | | | |
| | | Probable causes | | Check or fix | |
| <input type="radio"/> | <input type="radio"/> | | | Control voltage is too low | Increase the voltage to more than 90% of the rating. |
| | | <input type="radio"/> | | Control voltage is too high | Decrease the voltage to lower than 110% of the rating. |
| <input type="radio"/> | | | | Defective control circuit | Check the control circuit diagrams. |
| | | <input type="radio"/> | | Imperfect latch mechanism / Latch mechanism | Check the height of the roller. If necessary, adjust the height of the roller by releasing the bolt. |
| | | | <input type="radio"/> | Loose bolts | Check the tightness of bolts. |
| | | <input type="radio"/> | | Defective operation of the control switch | Check the wiring and clean the contact if contact resistance is high. Replace it if necessary. |
| <input type="radio"/> | | | | Blown fuse | Remove the cause of the fault and replace the fuses. |
| | | <input type="radio"/> | | Defective resistor / Resistor | Check the continuity of the resistor. |
| | | | <input type="radio"/> | Interrupter without vacuum | Check the vacuum interrupter. If necessary, replace it. |
| <input type="radio"/> | | | | Punctured rectifier | Check the rectifier. If necessary, replace it. |

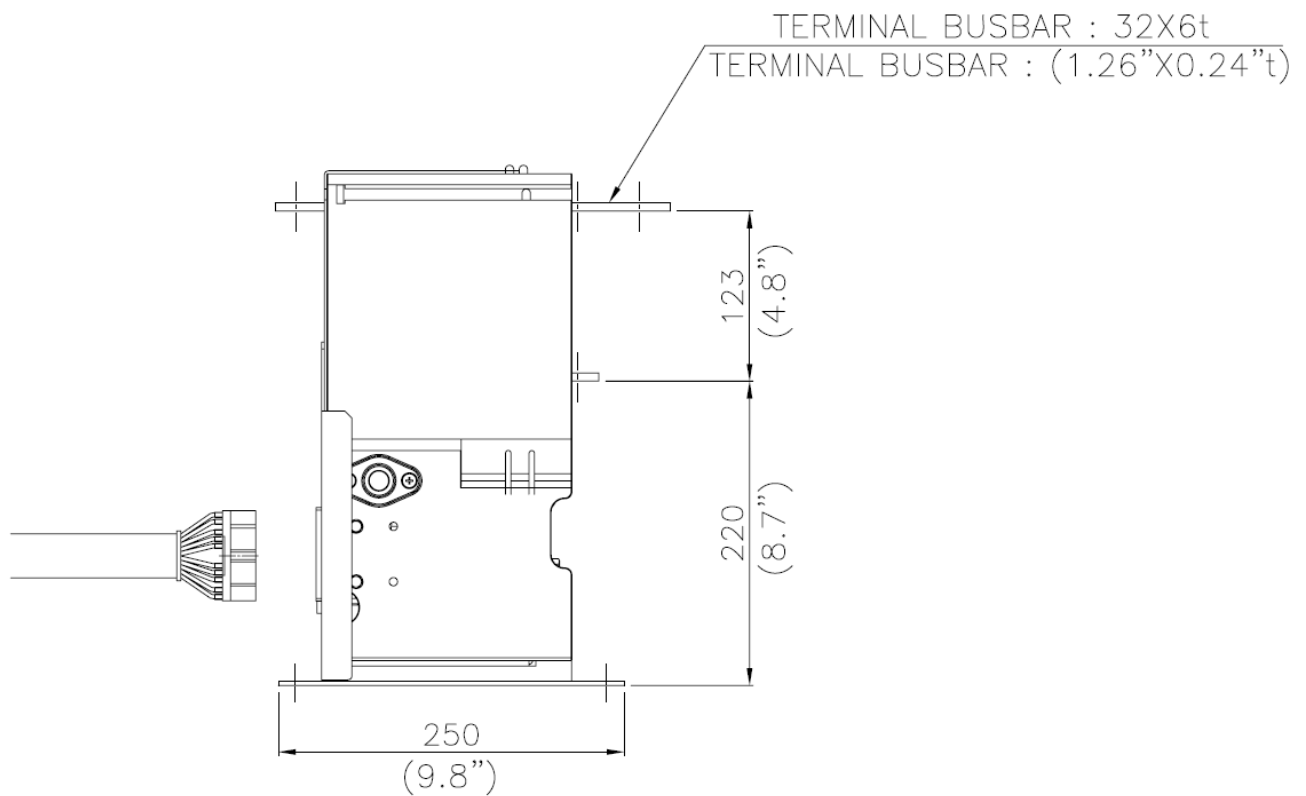
5. Specification Overview

| Specification | | Fixed type without fuse | Draw-out type without fuse | | | | |
|--|------------------------|--|----------------------------|---------------------|---------------------|------------------|------------------|
| Type | Continuously energized | 34-72-4-C-X-0-3-0-12 | 34-72-4-C-B-F1-0-12 | | | | |
| | Latched | 34-72-4-L-X-0-3-0-12 | 34-72-4-L-B-F1-0-12 | | | | |
| Rated insulation voltage (kV) | | 7.2 kV | | | | | |
| Rated operation voltage (kV) | | 6.6 kV | | | | | |
| Rated frequency (Hz) | | 50/60 Hz | | | | | |
| Rated current (A) | | 400 A | | | | | |
| Impulse withstand voltage (kV) (BIL) | | 60 kV | | | | | |
| Power frequency withstand voltage (kV/min) | | 20 kV/min | | | | | |
| Control dielectric strength (kV/min) | | 2 kV/min | | | | | |
| Making and breaking capability (kA) | | 4 kA | | | | | |
| Breaking Capacity (kA, O-3min-CO-3min-CO) | E1 | 4 (50 MVA@7.2 kV) | | | | | |
| | E2 | 50 @ 7.2 kV ** | | | | | |
| Peak current (kA) | | 1 sec | 6.3 kA | | | | |
| | | 30 sec | 3 kA | | | | |
| Mechanical Endurance | | Continuously energized | 1,000,000 operations | | | | |
| | | Latched | 300,000 operations | | | | |
| Control voltage(V) | | AC/DC 100~125 V | | | | | |
| Auxiliary contact | | 3 Normally Open and 2 Normally Closed Contacts | | | | | |
| Applicable load capacity | Motor (kW) | 3000 kW | | | | | |
| | Transformer (kVA) | 4000 kVA | | | | | |
| | Condenser (KVAR) | 2000 KVAR | | | | | |
| Weight (kg / lbs.) | | 19 kg / 42 lbs. | | | 35 kg / 77 lbs. | | |
| Operating Time and Current | | Control Voltage | Closing Current (A) | Holding Current (A) | Opening Current (A) | Closing Time(ms) | Opening Time(ms) |
| Continuously Energized Type | | 110 VDC | 2.5 | 1.0 | N/A | 80 Max. | 40 Max. |
| | | 220 VDC | 1.6 | 0.7 | N/A | | |
| | | 110 VAC | 2.0 | 0.8 | N/A | 80 Max. | |
| | | 220 VAC | 1.0 | 0.5 | N/A | | |
| Latched Type | | 110 VDC | 2.7 | N/A | 5.0 | 120 Max. | 25 Max. |
| | | 220 VDC | 1.7 | N/A | 4.0 | | |
| | | 110 VAC | 1.9 | N/A | 3.5 | 80 Max. | |
| | | 220 VAC | 1.2 | N/A | 3.0 | | |
| Control Voltage | | | | | | | |
| Closing | | 85~110 % of rated voltage | | | | | |
| Opening | | 70~110 % of rated voltage | | | | | |
| Rated Current of Auxiliary Contact | | | | | | | |
| Voltage | | 110 VAC | | | 220 VAC | | |
| Rated Current | | 5 A | | | 2 A | | |
| Operation condition | | | | | | | |
| Altitude | | Less than 1,000 A.S.L | | | | | |
| Relative humidity | | Below 85 % | | | | | |
| Ambient temperature | | -5C ~ +40C | | | | | |
| Switching frequency | | Not faster than 20 operations / 1 minute | | | | | |
| Required mounting direction | | Horizontal or Vertical | | | | | |
| Additional Ratings | | | | | | | |
| Drop-out control voltage | | AC/DC 25 V | | | | | |
| Chopping current | | 1 A | | | | | |

6. Dimensions



Dimensions specified in mm (inches).



Dimensions specified in mm (inches).

California Customers:

California Proposition 65 Warning

WARNING: this product and associated accessories may contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information visit <https://p65warnings.ca.gov>



MOTORTRONICS™

Solid State AC Motor Control

MVF *Series*

Medium Voltage Vacuum Contactor

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