2-way fixed cable interlock kit - RF

Instructions apply to

UL489 : PD-RF
IEC : PD-RF, IZMX40

**WARNING**

(1) ONLY QUALIFIED ELECTRICAL PERSONNEL SHOULD BE PERMITTED TO WORK ON THE EQUIPMENT.
(2) ALWAYS DE-ENERGIZE PRIMARY AND SECONDARY CIRCUITS IF A CIRCUIT BREAKER CANNOT BE REMOVED TO A SAFE WORK LOCATION.
(3) ALL CIRCUIT BREAKERS SHOULD BE SWITCHED TO THE OFF POSITION AND MECHANISM SPRINGS DISCHARGED.
FAILURE TO FOLLOW THESE STEPS FOR ALL PROCEDURES DESCRIBED IN THIS INSTRUCTION LEAFLET COULD RESULT IN DEATH, BODILY INJURY, OR PROPERTY DAMAGE.

**WARNING**

THE INSTRUCTIONS CONTAINED IN THIS IL AND ON PRODUCT LABELS HAVE TO BE FOLLOWED. OBSERVE THE FIVE SAFETY RULES:
– DISCONNECTING
– ENSURE THAT DEVICES CANNOT BE ACCIDENTALLY RESTARTED
– VERIFY ISOLATION FROM THE SUPPLY
– EARTHING AND SHORT-CIRCUITING
– COVERING OR PROVIDING BARRIERS TO ADJACENT LIVE PARTS
DISCONNECT THE EQUIPMENT FROM THE SUPPLY. USE ONLY AUTHORIZED SPARE PARTS IN THE REPAIR OF THE EQUIPMENT. THE SPECIFIED MAINTENANCE INTERVALS AS WELL AS THE INSTRUCTIONS FOR REPAIR AND EXCHANGE MUST BE STRICTLY ADHERED TO PREVENT INJURY TO PERSONNEL AND DAMAGE TO THE SWITCHBOARD.
Section 1: General Information

The mechanical interlock holds one of the breakers tripped (prevents closure) when the other is closed. A lever assembly is mounted on each breaker and interfaces with the pole shaft and tripper bar. The lever assemblies are interconnected with cables. Cables can be used for any orientation of the breakers, and are available in 5, 6, 8 and 10-foot lengths (1.5; 1.8; 2.4 and 3.0 m). Individual cable kits are ordered separately.

Required Tools

- 10 mm drive socket
- 11/16-inch open-end wrench
- 3/8-inch open-end wrench
- 3/8-inch drive socket
- 2 mm Allen wrench
- Drive extension
- Adjustable Wrench
- T15 TORX Driver

Kit Parts Identification

Refer to Figure 1 for visual identification of the parts listed below:

(A) Trip Pin (2)
(B) M3 x 16 mm flat-head screw (2)
(C) M6 x 12 mm hex bolt (8)
(D) Lock washer (8)
(E) Drive arm (2)
(F) M6 x 30 mm flat-head screw (2)
(G) Cable bracket (4)
(H) M6 x 10 mm thread-forming screws (10)
(I) Grease tube (1)
(J) Interlock assembly (2)
(K) Cable assembly (2) – 5, 6, 8 and 10-foot lengths (1.5; 1.8; 2.4 and 3.0 m)
(L) Long spacer tube
(M) Fixed mounting bracket (2)

Section 2: Installation of Two-Way Cable Interlock

Proceed with the following 9 steps:

Step 1. Remove the four screws (six for 4-pole breaker) holding the cover in place. Pull down on the charging handle and remove the front cover.

Step 2. Remove and retain the upper right M5 x 12 mm screw (N) rom the Fixed Breaker Mounting feet (ref. IL01301076E).

Step 3: Install the drive arm (E) to the end of the pole shaft using an M6 x 30 mm flat-head screw (F). The drive arm should be oriented as shown (Figure 4). Torque to 65-85 in-lbs (7.3-9.6 Nm).

Step 4: Install the trip pin (A) to the trip arm using an M3 x 16 mm flat-head screw (B). Use a wrench to hold the trip lever during installation. Torque to 3-5 in-lbs (0.3 - 0.6 Nm). Replace fixed side plate (Figure 4).
Figure 3. Step 5.

Remove drive arm window

Figure 4. Steps 3 and 4.

Step 5: Before reattaching the cover, the drive arm window must be removed from the side of the cover (Figure 3). Either use a utility knife to cut the window from the cover, or use a punch and a small hammer to carefully punch out the window. Once the window is removed, use a small file to remove any burrs that remain. Make certain that all pieces and/or particles are cleaned up and removed before proceeding.

Step 6: Fasten the interlock assembly (J) to the fixed mounting bracket using four M6 x 12 mm hex bolts (C) and four lock washers (D). Torque to 40 – 50 in-lbs (4.5 – 5.6 Nm) (Figure 5).

Step 7: Fasten the fixed mounting bracket (M) to the right side breaker mounting bracket) using three M6 x 10 mm thread-forming screws (H). Torque to 65 – 85 in-lbs (7.3 – 9.6 Nm) (Figure 5).

Step 8: Re-install M5 x 12 mm screw (N). Torque to 20 in-lbs (2.2 Nm) (Figure 5).

Step 9: Fasten two cable brackets (G) to the fixed right-side sheet just below the interlock assembly (mounted in Step 5) using two M6 x 10 mm thread-forming screws (H). Torque to 65 – 85 in-lbs (7.3 – 9.6 Nm). (Figure 6)

Step 10: This step offers cable routing and installation procedures. Make sure that cables move freely in their cable housings before installation.
**Installation Recommendations:**

- 4 inch (102 mm) minimum allowable cable housing bend radius
- Use plastic wire ties/clamps to attach cable housing to structure after installation and adjustment
- Do not compress cable housing
- Recheck to ensure cables move freely

**Step 11:** This step describes how to first attach the drive (short) end of a cable to its interlock assembly and cable bracket. See Figures 8 to 11 for details:

1. Remove small nut, compression spring, and spacer tube from end of rod.
2. Slide rubber boot toward tip of rod.
3. Unthread outer bulkhead nut and slide nut and lock washer toward tip.
4. Insert threaded end of rod into swivel fitting.
5. Slide smaller diameter portion of bulkhead fitting into cable bracket slot (see Figure 10).
6. Raise cable assembly until threaded portion of bulkhead fitting enters slotted hole in cable bracket (threads show above bracket).
7. Bring bulkhead washer and nut down to threads and hand tighten.
8. Adjust two bulkhead nuts to approximately center the bulkhead fitting on the cable mounting bracket.
9. Hand tighten the bulkhead nuts at this time.
10. Slide rubber boot back into place over end of bulkhead fitting.
11. Replace spacer tube, compression spring, and small nut on end of rod.
12. Lower nuts should be shouldered against end of thread and upper nut tightened against spacer tube.
13. Hold lower nuts and torque upper nut to 30–40 in-lbs (3.3–4.5 Nm).

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**Figure 7. Step 7.**

**Figure 8. Step 11.**

**Figure 9. Step 11 - Cable Assembly.**
Step 11 - Mounting Cable Assembly in Cable Bracket.

Slide smaller diameter portion of bulkhead fitting into cable bracket slot. Raise cable assembly until threaded portion of bulkhead fitting enters slotted hole in cable bracket (threads show above bracket).

Figure 10. Step 11 - Mounting Cable Assembly in Cable Bracket.

Steps 10 and 11.

Step 12: This step describes how to attach the driven (long rod) end of a cable to its interlock assembly and cable bracket on another breaker. This is accomplished by repeating Step 11, except the driven end does not utilize a compression spring between the swivel and outer nut. Replace short spacer tube on cable with the long spacer tube from this kit. Install the second cable.

Figure 11. Step 11.

Step 12.

Step 13: This step describes how to adjust the cables. Cable adjustments are made with the large bulkhead nuts only. Smaller nuts on the rod ends should not be moved. Adjustments are made with all breakers OPEN.

Ensure all bulkhead fittings are still approximately centered on cable mounting bracket, allowing for adjustment room in either direction. Repeat items 8 and 9 of Step 12 if any bulkhead fitting requires centering.

Perform initial adjustments on driven (long rod) end of cable (refer to Figure 14). Cables on both ends should be adjusted to the same clearance. Too much clearance – adjust both bulkhead nuts to retract cable housing.

No clearance – advance cable housing in a similar manner.

For additional adjustment length – bulkhead nuts on other end of cable can be used.

Torque cable bulkhead nuts on both ends to 100 -120 in-lbs (11 – 13 Nm) when proper clearance is attained on driven end.

Figure 12. Step 12.

Figure 13. Step 12.

Figure 14. Steps 10 and 11.
Section 3: Functional Test of Interlock Assembly

Begin test sequence with all breakers OPEN.

Check 1: CHARGE and CLOSE Breaker A.
- Inspect driven lever on Breaker B – It should be positioned as shown in Figure 14 - Check 1.
- CHARGE Breaker B and attempt to close Breaker B – it should not respond to CLOSE attempt (no noise, spring discharge or contact motion)
- If Breaker B responds to the CLOSE attempt additional adjustments may be required at cable mounting brackets (refer to Section 2, Step 13).

Check 2: OPEN Breaker A
- The interlock should release
- CLOSE Breaker B – Verify it closes with OPEN/CLOSED indicator
- Breaker A should now be held in the OPEN position
- OPEN Breaker B

Repeat Checks 1 and 2 above on Breaker B
- Verify proper operation

The mechanical interlock is now properly installed and adjusted. Utilize a light amount of the supplied lubricant grease (I) if any interlock parts are sticky. This is only recommended if needed.

![Interlock Logic](image)

<table>
<thead>
<tr>
<th>Breaker A</th>
<th>Breaker B</th>
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<tbody>
<tr>
<td>0</td>
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<tr>
<td>1</td>
<td>0</td>
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Figure 15. Test Sequence.
Both breakers shown OPEN (not interlocked)

Figure 16. Cable Interlock Installed.
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