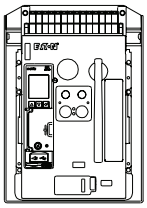
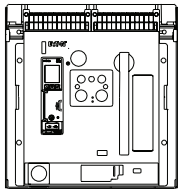
Auxiliary switch

Instructions apply to:



UL489 : PD-NF
IEC : PD-NF, IZMX16



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) DRAWOUT CIRCUIT BREAKERS SHOULD BE LEVERED (RACKED) OUT TO THE DISCONNECT POSITION.
(4) 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; AND
– 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.

Power Defense™

Powering Business Worldwide

Section 1: General information

The right accessory tray is used to mount auxiliary switches in the circuit breaker. Auxiliary switches provide remote electrical indication if the circuit breaker is open or closed. They are provided as two-switch combinations, with a maximum of two two-switch combinations for the NF frame and six two-switch combinations for the RF frame. Each two-switch combination provides two normally open ("a") and two normally closed ("b") contacts (see Table 1). The combination is supplied with red, blue, and black secondary leads connected to three secondary connector plugs (see Figure 1).

Table 1. Auxiliary switch ratings.

Control voltage	Frequency	Contact rating (amperes)
250	50/60 Hz	10
125	DC	0.5
250	DC	0.25

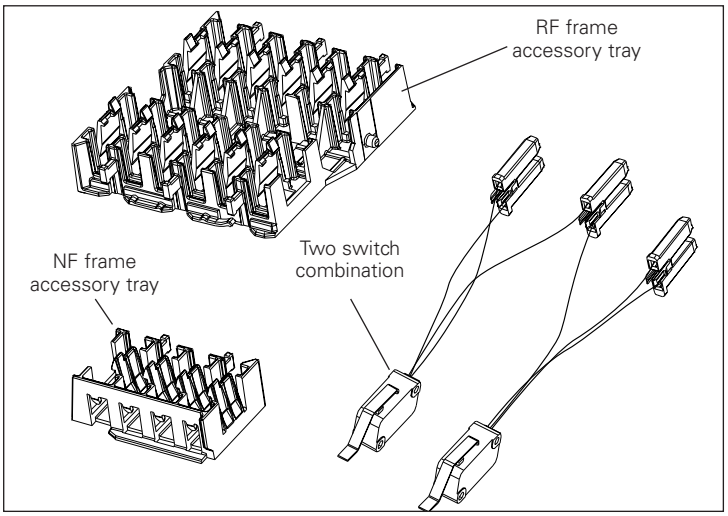


Figure 1. Accessory tray and auxiliary switches.

There are two different wire lengths for the two-switch combinations. The 5.5 inches (139,7 mm) wire length switches are used in the line side position of the NF frame and RF frame. The 9.5 inches (241,3 mm) wire length switches are used in the load side position of the RF frame only. Each of the two different wire length kits come with pre-printed labels so the wires can be properly marked to match the terminal blocks. Refer to Table 2 for the label placement.

N**ote:** Auxiliary switches ordered from the factory are supplied with labels pre-applied to the wires.

Table 2. Label placement.

Frame tray positions (Line side)					
1 NF & RF	2 NF & RF	3 NF & RF	4 NF & RF	5 RF only	6 RF only
7 RF only	8 RF only	9 RF only	10 RF only	11 RF only	12 RF only

(Load side)

Tray position RF frame	NF frame	Label RF/NF	Wire
1	1	57/45	Black
1	1	58/46	Red
1	1	59/47	Blue
2	2	60/48	Blue
2	2	61/49	Black
2	2	62/50	Red
3	3	63/51	Black
3	3	64/52	Red
3	3	65/53	Blue
4	4	66/54	Blue
4	4	67/55	Black
4	4	68/56	Red
5		69	Black
5		70	Red
5		71	Blue
6		72	Blue
6		73	Black
6		74	Red
7		75	Black
7		76	Red
7		77	Blue
8		78	Blue
8		79	Black
8		80	Red
9		81	Black
9		82	Red
9		83	Blue
10		84	Blue
10		85	Black
10		86	Red
11		87	Black
11		88	Red
11		89	Blue
12		90	Blue
12		91	Black
12		92	Red

Section 2: Installation of auxiliary switch in right accessory tray

Note: A number of graphics in this instruction leaflet use the RF frame breaker only as typical examples. The NF frame is similar in those situations.

Proceed with the following 11 steps.

Step 1: Remove the four screws holding the front cover in place (two on each side of the cover).

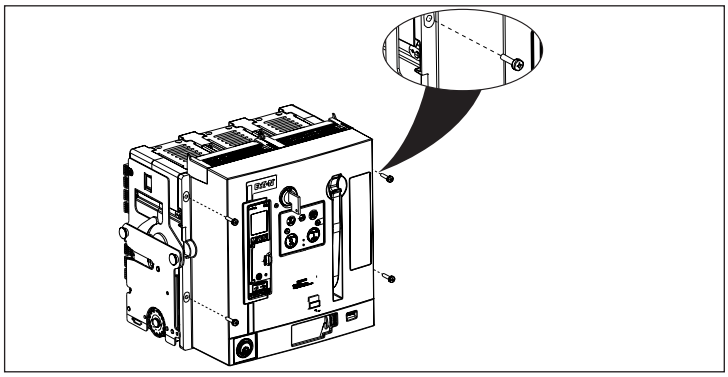


Figure 2. Step 1 (RF frame shown).

Step 2: Remove the front cover. Pull down on the charging handle to simplify removal.

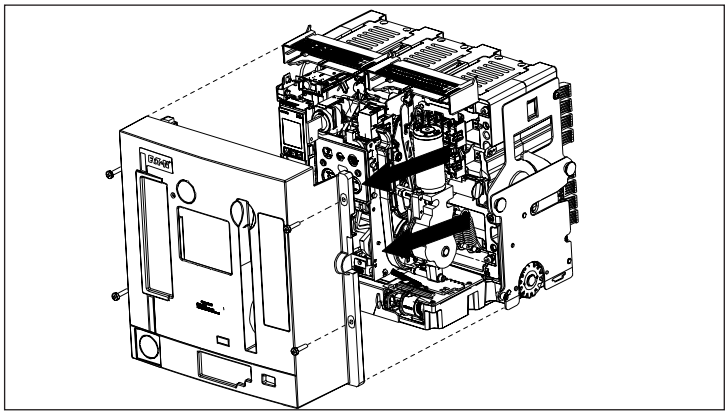


Figure 3. Step 2 (RF frame shown).

Step 3: Locate the right accessory tray. Use your thumb and index fingers to slide it to the right as shown for removal.

N**ote:** A minimum of 2 inches (50,8 mm) of side clearance is required on an installed fixed breaker for tray removal.

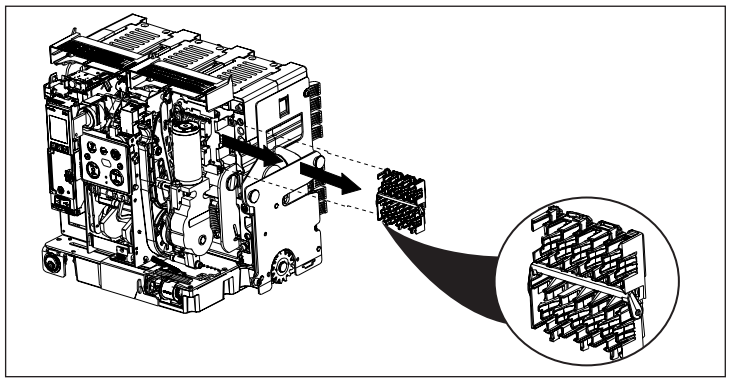


Figure 4. Step 3 (RF frame shown).

Step 4: With the NF frame right accessory tray positioned as shown, tilt the two auxiliary switches back as shown to properly position them for final installation.

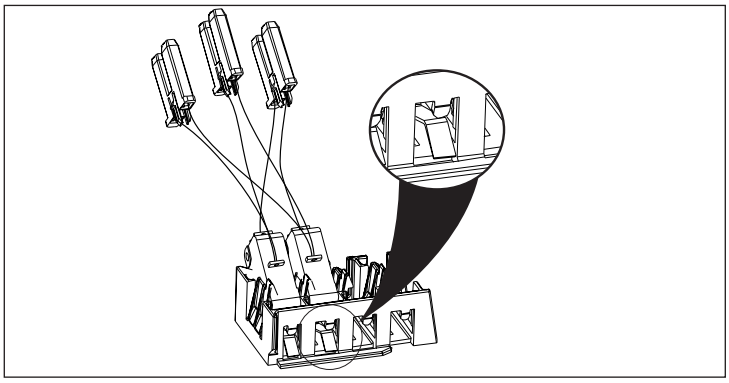


Figure 5. Step 4 (NF frame shown).

Step 4a: For the RF frame, ensure the metal levers of the auxiliary switches are above the plastic actuation bar. The auxiliary switches with the 5.5 inch (139,7 mm) length wires must be used in the line side of the accessory tray, and the 9.5 inch (241,3 mm) wire length auxiliary switches in the load side of the tray.

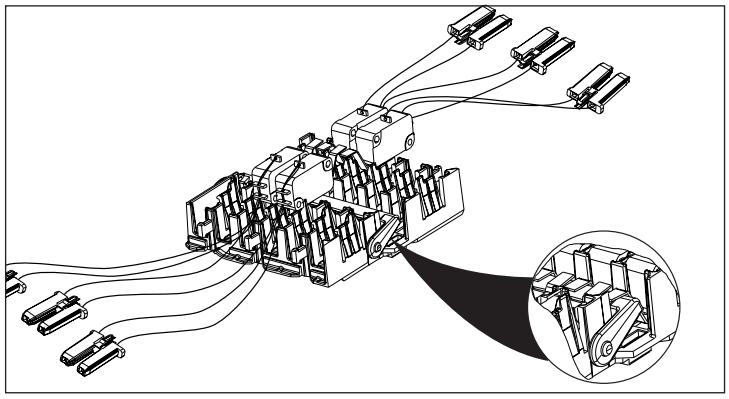


Figure 6. Step 4 (RF frame shown).

Step 5: Carefully push the auxiliary switches down as shown until a snapping sound is heard. This sound indicates the switches are locked in position.

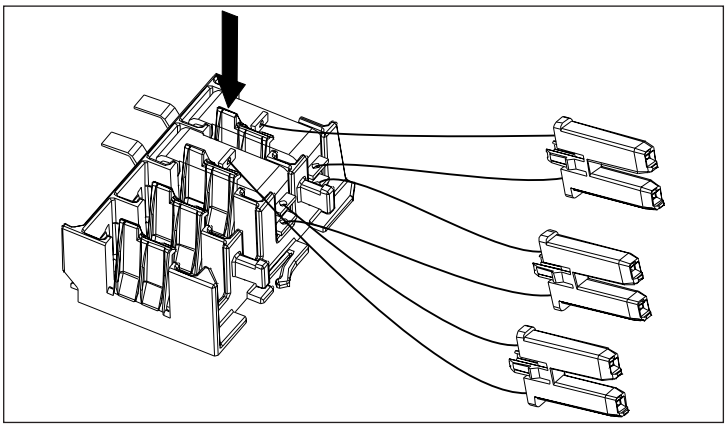


Figure 7. Step 5 (NF frame shown).

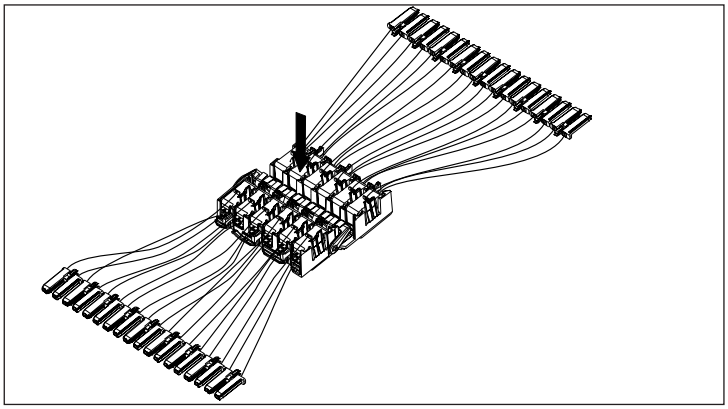


Figure 8. Step 5 (RF frame shown).

Step 6: Repeat Steps 4 and 5 as needed to install additional auxiliary switches.

Step 7: When the secondary leads are routed out of the tray as shown in Step 5, the right accessory tray is ready to be installed back into the breaker.

Step 8: Place the right accessory tray with installed auxiliary switches back in its original position. Take care to ensure that both the top and bottom of the accessory tray slide in under the metal rails. Be careful not to bind secondary wires or connector plugs.

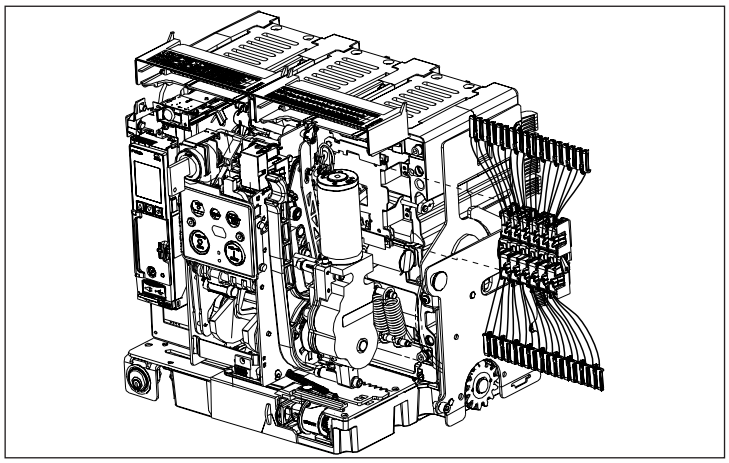


Figure 9. (RF frame shown).

Step 9: The installed right accessory tray should look as shown with secondary leads extending up and down and ready to be made.

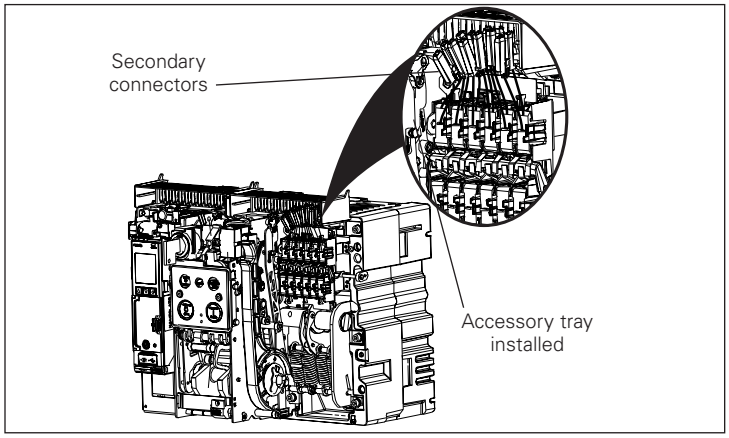


Figure 10. Step 9 (RF frame shown).

Step 10: Make the appropriate secondary connections as outlined in Section 4. If necessary, bundle secondary wires using industry accepted wire tie practices.

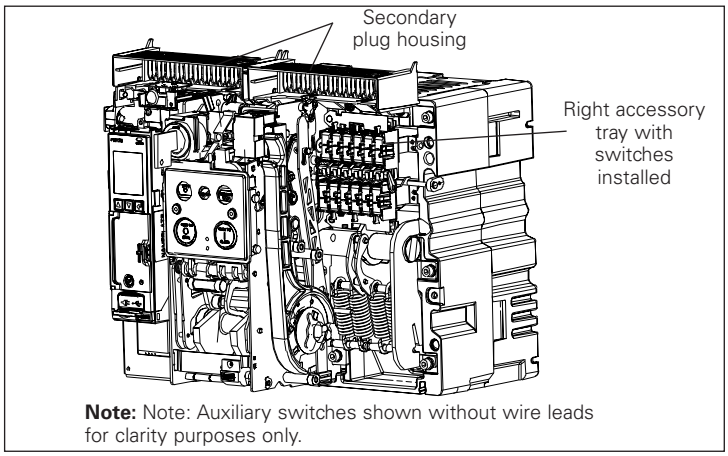
Step 11: Replace the front cover and secure it in place with the mounting screws previously removed in Step 1.

Section 3: Removal of auxiliary switch from right accessory tray

Proceed with the following seven steps.

Step 1: If necessary, remove the front cover from the breaker by performing Steps 1 and 2 of Section 2.

Step 2: Locate the right accessory tray and disconnect the appropriate secondary connections as described in Section 4.



Note: Note: Auxiliary switches shown without wire leads for clarity purposes only.

Figure 11. Step 2 (RF frame shown).

Step 3: Once the secondary leads are disconnected, slide the tray to the right for removal.

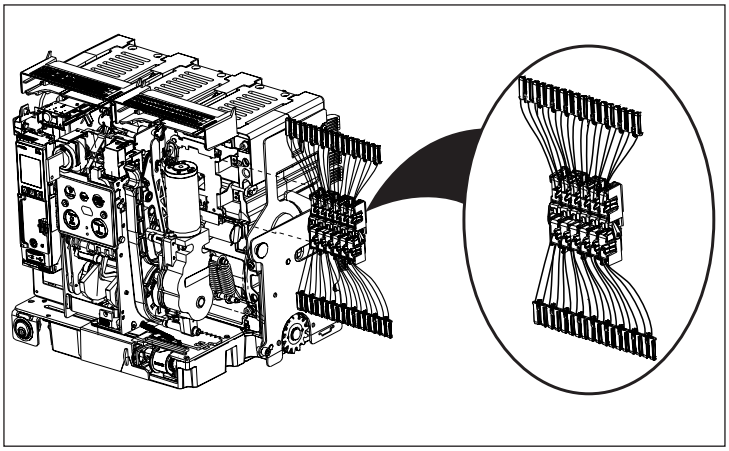


Figure 12. Step 3 (RF frame shown).

Step 4: With the right accessory tray positioned as shown, pull back on the locking tab of each auxiliary switch being removed from the tray.

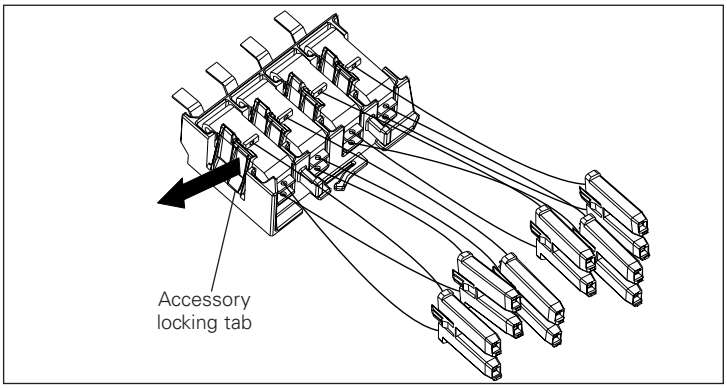


Figure 13. Step 4 (NF frame shown).

Step 5: Lift the auxiliary switches to release them from the tray.

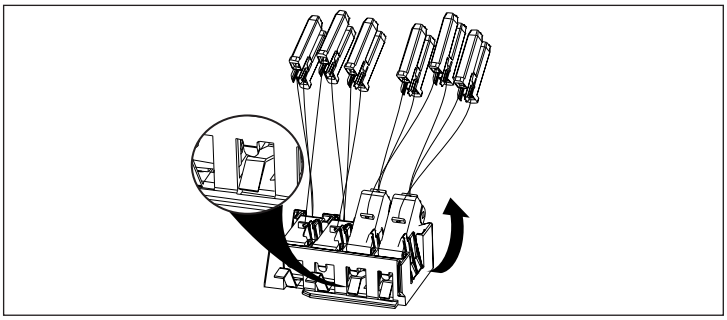


Figure 14. Step 5 (NF frame shown).

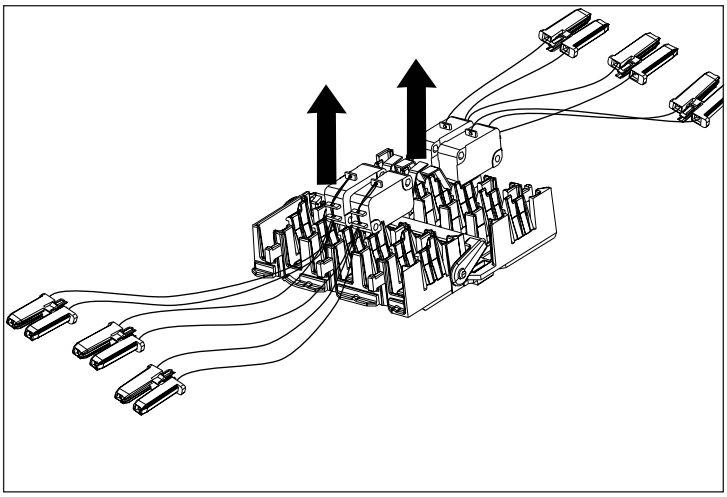


Figure 15. Step 5 (RF frame shown).

Step 6: Repeat Steps 4 and 5 if another set of two auxiliary switches is to be removed.

Step 7: If the tray will have a new set of auxiliary switches installed, follow Steps 4 through 11 of Section 2. If not, just complete Steps 8 through 11 of Section 2.

Section 4: Accessory secondary connections

⚠ CAUTION

IDENTIFICATION WIRE NUMBERS MUST MATCH THE IDENTIFICATION NUMBERS ON THE SECONDARY BLOCK/PLATE.

General Information

1. Some electrical accessory leads are tagged with numbers associated with the applicable connection diagram located in instruction book TD013001EN. Leads are also supplied with keyed secondary connector plugs to ensure proper connections (Figure 16). If the auxiliary switch leads are not labeled, pre-printed labels are provided in the auxiliary switch kit. Apply the proper numbered label for the secondary terminal block location. Refer to Table 2.
2. Secondary connections are made by plugging the connector plugs into the appropriate location. A connector plug already connected can be removed by squeezing two release tabs together with small needle nose pliers and pulling out (Figure 17).

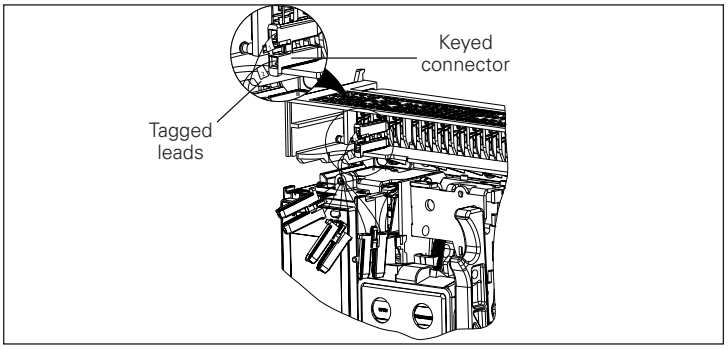


Figure 16. Leads and connectors.

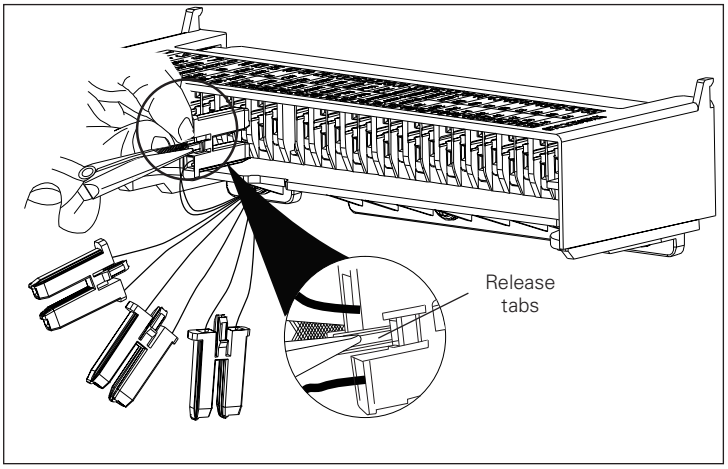


Figure 17. Connector plug removal.

Fixed breaker connections

Proceed with the following five steps.

Step 1: Become familiar with the fixed terminal block DIN rail type mounting plate where secondary connections are made.

N**ote:** Secondary connection points have numerical and descriptive laser-etched identifications.

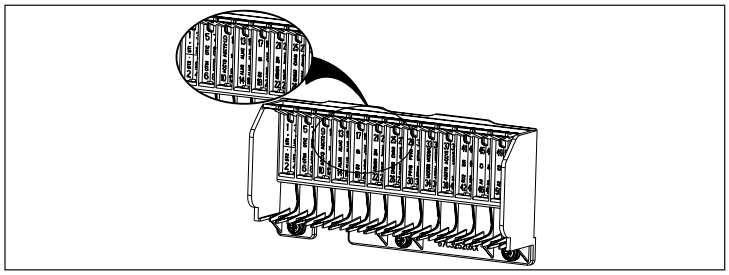


Figure 18. Step 1.

Step 2: Plug accessory connector plug into fixed secondary terminal block.

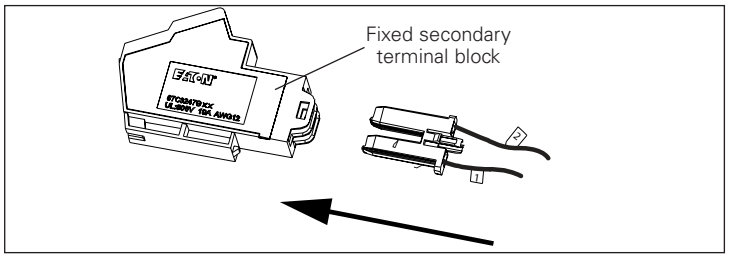


Figure 19. Step 2.

Step 3: Identify the correct mounting location on fixed terminal block mounting plate for mounting fixed secondary terminal block. First, insert the bottom end of the fixed secondary terminal block into the proper location on the DIN rail type mounting plate.

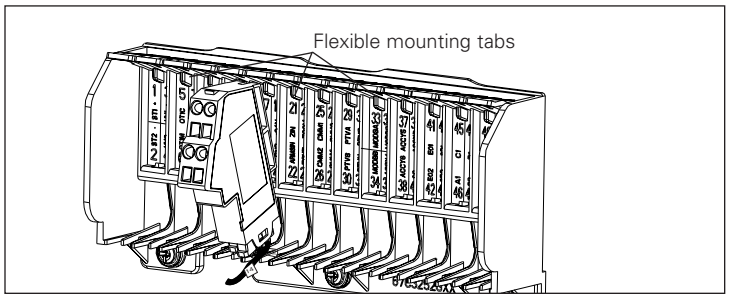


Figure 20. Step 3.

Step 4: Rotate the top end of the terminal block in until it engages the appropriate flexible mounting tab at the top of the mounting plate with a clicking sound.

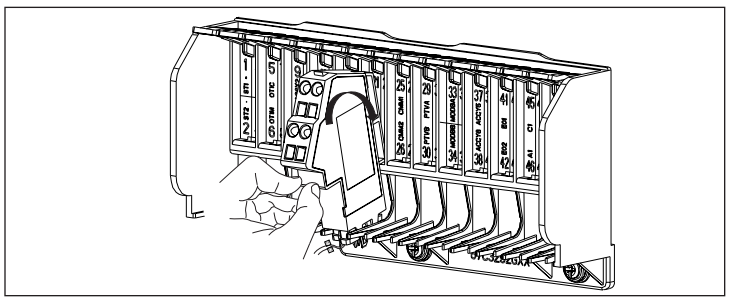


Figure 21. Step 4.

IMPORTANT

TO REMOVE RIGHT AND LEFT ACCESSORY TRAYS OR ANY OTHER ELECTRICAL ACCESSORY, THE APPROPRIATE ACCESSORY CONNECTOR PLUG MUST FIRST BE DISCONNECTED.

Step 5: To remove an accessory plug on a fixed circuit breaker, the appropriate fixed secondary terminal block must first be removed. To remove a fixed secondary terminal block, lift up on the small flexible mounting tab at the top of the fixed terminal block mounting plate, and rotate the terminal block out in the opposite direction shown in step 4. Once the terminal block is removed, the accessory connector plug can be unplugged from the bottom of the terminal block. Refer to Item 2 and Figure 17 under the heading "General information" in Section 4 for detailed assistance with the removal.

Drawout breaker connections

Proceed with the following three steps.

Step 1: Become familiar with the drawout secondary plug housing where secondary connections are made.

Note: Secondary connection points have numerical and descriptive laser-etched identifications on top of the housing directly matching the plug-in locations below.

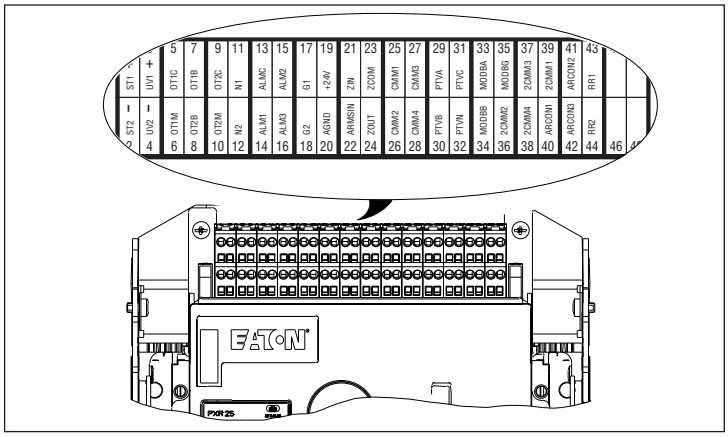


Figure 22. Step 1 (NF frame shown).

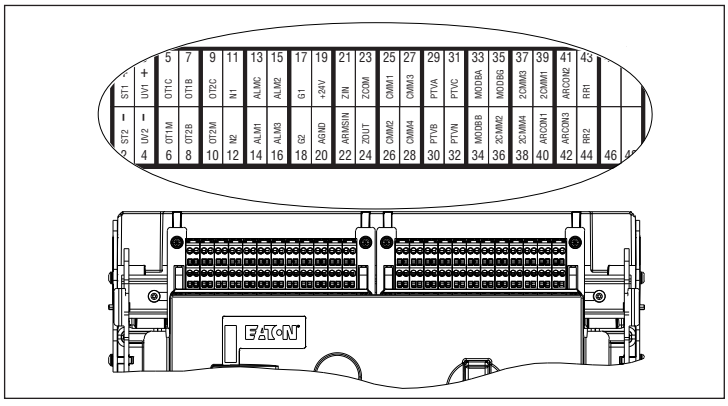


Figure 23. Step 1 (RF frame shown).

Step 2: Plug accessory connector plug into position in the secondary plug housing matching the laser-etched identification on top of the housing.

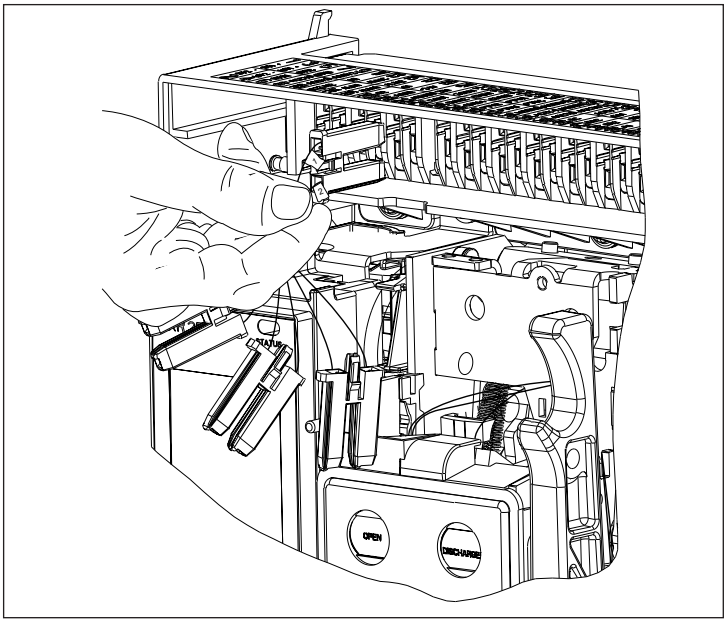


Figure 24. Step 2.

IMPORTANT

TO REMOVE RIGHT AND LEFT ACCESSORY TRAYS OR ANY OTHER ELECTRICAL ACCESSORY, THE APPROPRIATE ACCESSORY CONNECTOR PLUG MUST FIRST BE DISCONNECTED.

Step 3: To remove an accessory connector plug on a drawout circuit breaker, unplug it from its secondary plug housing. Refer to Item 2 and Figure 17 under the heading "General information" in Section 4 For detailed assistance with the removal.

Section 5: Auxiliary switch testing

IMPORTANT

BEFORE PERFORMING ANY TEST ACTIVITIES, LEVER A DRAWOUT CIRCUIT BREAKER TO THE TEST POSITION. FOR FIXED TYPE CIRCUIT BREAKERS, MAKE SURE PRIMARY CIRCUITS ARE DE-ENERGIZED.

Put the circuit breaker in the positions indicated in the appropriate table (Tables 3 or 4) and check continuity between red and black leads. Also check the continuity between the blue and black leads.

Table 3. Testing procedures NF frame.

Breaker position	Continuity between red and black lead pairs	Continuity between blue and black lead pairs
Open	NO	47 and 45
		48 and 49
		53 and 51
		54 and 55
Closed	46 and 45	NO
	50 and 49	
	52 and 51	
	56 and 55	

Table 4. Testing procedures RF frame.

Breaker position	Continuity between red and black lead pairs	Continuity between blue and black lead pairs
Open	NO	59 and 57
		60 and 61
		65 and 63
		66 and 67
		71 and 69
		72 and 73
		77 and 75
		78 and 79
		83 and 81
		84 and 85
		89 and 87
		90 and 91
Closed	58 and 57	
	62 and 61	
	64 and 63	
	68 and 67	
	70 and 69	
	74 and 73	
	76 and 75	
	80 and 79	
	82 and 81	
	86 and 85	
	88 and 87	
	92 and 91	

Notes:

Disclaimer of warranties and limitation of liability

The information, recommendations, descriptions, and safety notations in this document are based on Eaton Corporation's ("Eaton") experience and judgment, and may not cover all contingencies. If further information is required, an Eaton sales office should be consulted.

Sale of the product shown in this literature is subject to the terms and conditions outlined in appropriate Eaton selling policies or other contractual agreement between Eaton and the purchaser.

THERE ARE NO UNDERSTANDINGS, AGREEMENTS, WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, OTHER THAN THOSE SPECIFICALLY SET OUT IN ANY EXISTING CONTRACT BETWEEN THE PARTIES. ANY SUCH CONTRACT STATES THE ENTIRE OBLIGATION OF EATON. THE CONTENTS OF THIS DOCUMENT SHALL NOT BECOME PART OF OR MODIFY ANY CONTRACT BETWEEN THE PARTIES.

In no event will Eaton be responsible to the purchaser or 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 or loss of use of equipment, plant or power system, cost of capital, loss of power, additional expenses in the use of existing power facilities, or claims against the purchaser or user by its customers resulting from the use of the information, recommendations, and descriptions contained herein.

The information contained in this manual is subject to change without notice.

Eaton
Electrical Sector
1000 Eaton Boulevard
Cleveland, OH 44122
United States
877-ETN-CARE (877-386-2273)
Eaton.com

© 2019 Eaton
All Rights Reserved
Printed in USA
Publication No. IL0131096EN / LNT09
Part Number: IL0131096H03
January 2019

Powering Business Worldwide

Eaton is a registered Trademark.

All other trademarks are property of their respective owners.