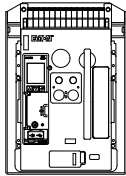
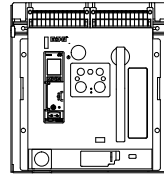


Drawout secondary upgrade

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
- 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.

Effective January 2019

Section 1: General information about the updated drawout secondary terminal blocks

These instructions detail the upgrade process from the circuit breaker with Digitrip drawout secondary terminal blocks to the circuit breaker with PXR drawout secondary terminal blocks. The number of terminal blocks and contact points change slightly from the Digitrip design to the PXR design (see Table 1). The number of terminal blocks mounted depends on a number of considerations, such as whether the circuit breaker is electrically or manually operated and how many features are required.

Tools/materials required

- #2 Phillips head screwdriver
- Slotted 1/8" / 3 mm screwdriver

Kit parts identification

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

(A) Terminal block	NF - (14)	RF - (24)
(B) Terminal bracket	NF - (1)	RF - (2)
(C) Alignment bracket	NF - (1)	RF - (2)
(D) Jumper wire	(1)	
(E) Cassette secondary over label	NF - (1)	RF - (1)
(F) Cassette catalog # over label	(1)	

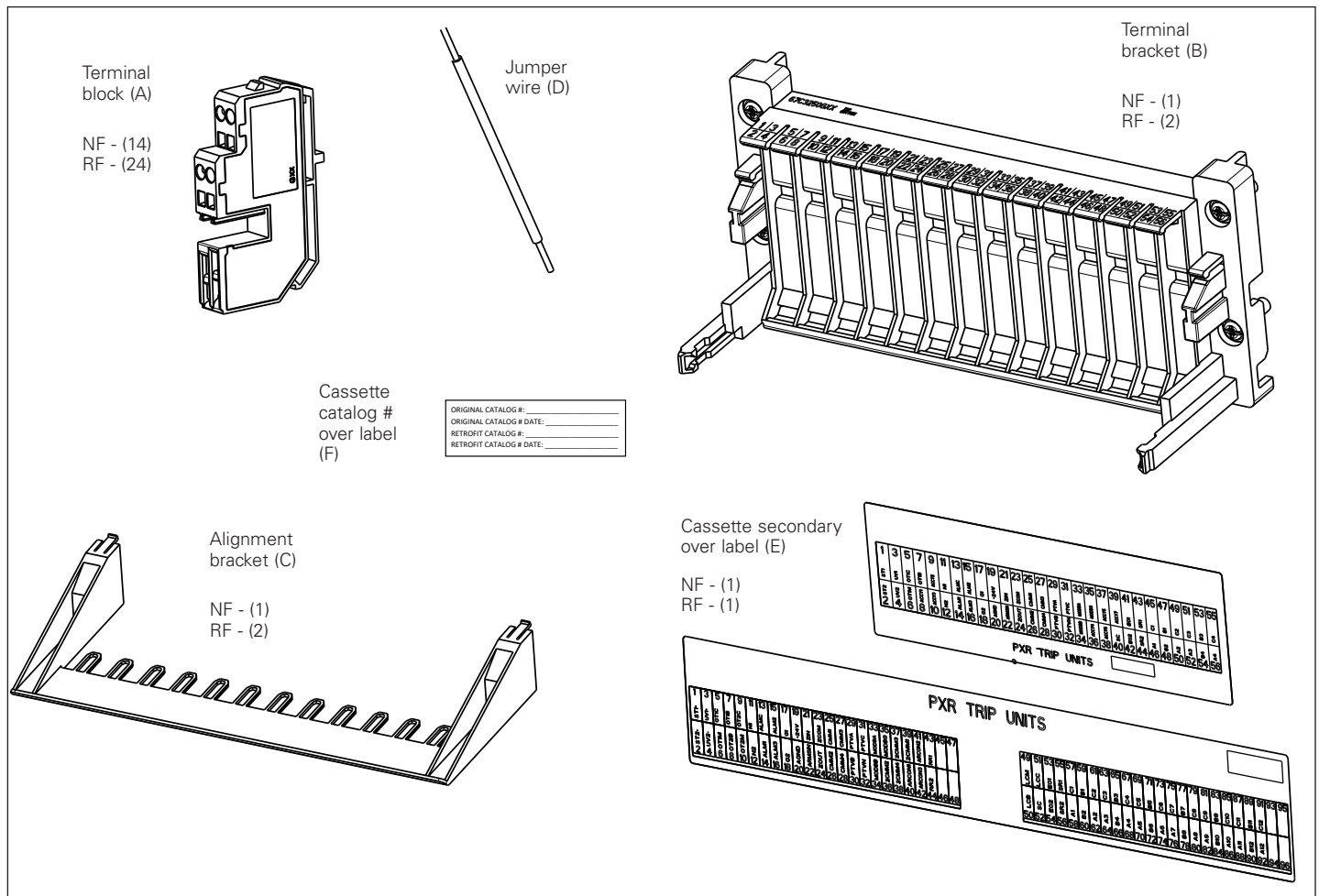


Figure 1. Contents of kit.

Table 1. Terminal block and contact point changes from the secondary terminal block upgrade.

	NF frame (1 individual cradle)		RF frame (2 individual cradles)	
	Terminal blocks	Contact points	Terminal blocks	Contact points
Digitrip	27	54	46	92
PXR (upgrade)	14	56	24	96

▲ IMPORTANT

SOME SECONDARY CONTROL POINTS HAVE CHANGED BETWEEN DESIGNS. REVIEW THE CROSS REFERENCE INFORMATION PROVIDED IN TABLE 2 TO BECOME FAMILIAR WITH THESE CHANGES.

Table 2. PXR/Digitrip cross reference.

NF point cross reference

PXR point position	PXR point name	Digitrip point position	General description	Function	Individual point description
1	ST1+	1	Shunt trip	Remote tripping	Shunt trip positive
2	ST2-	2			Shunt trip negative
3	UV1+	3	Under voltage release	Remote tripping	UVR positive/second shunt trip positive
4	UV2-	4			UVR negative/second shunt trip negative
5	OT1C	5	Bell alarm 1	Indicates when breaker opens via the trip unit.	Over-current trip switch 1 common
6	OT1M	6			Over-current trip switch 1 make (will "make" when breaker trips).
7	OT1B	7			Over-current trip switch 1 break (will "break" when breaker trips).
8	ACCY1	8	Bell alarm 2	Indicates when breaker opens via the trip unit.	Over-current trip switch 2 break (will "break" when breaker trips).
9	ACCY2	9			Over-current trip switch 2 common.
10	ACCY3	10			Over-current trip switch 2 make (will "make" when breaker trips).
11*	N1	15	External neutral sensor	External neutral trip unit input	Neutral 1 (external neutral sensor "start lead").
12*	N2	16			Neutral 2 (external neutral sensor "finish lead").
13	ALMC	11	Alarm relay contacts	Alarm 1 - Maintenance mode is active. Alarm 2 - Hi-load alarm or ground alarm. Alarm 3 - electronic OTS.	Alarm common "relay common"
14	ALM1	12			Alarm 1 "Normally open contact" - Remote indication of problem or maintenance mode is active.
15	ALM2	13			Alarm 2 "Normally open contact" - Hi-load alarm (no GF) or ground alarm indication.
16	ALM3	N/A			Alarm 3 "Normally open contact" - electronic OTS.
17	G1	17	External ground fault sensor	External ground fault sensor trip unit input	Ground 1 (external ground fault source sensor "start lead").
18	G2	18			Ground 2 (external ground fault source sensor "finish lead").
19	+24V	21	Trip unit auxiliary power	External trip unit power	+24 VDC
20	AGND	22	Analog ground	Ground contact for trip unit functions	Analog ground
21	ZIN	29	Zone selective interlocking	Selective coordination	Zone selective interlocking IN
22	ARMSIN	34	Maintenance mode	Low level instantaneous setting	Maintenance mode 2 (analog switch to activate maintenance mode).
23	ZCOM	28	Zone selective interlocking	Selective coordination	Zone selective interlocking common
24	ZOUT	27			Zone selective interlocking OUT
25	CMM1	23	Trip unit communications module #1	Trip unit communications	First Comm channel - transmit positive
26	CMM2	24			First Comm channel - transmit negative

(cont.).

Table 2. PXR/Digitrip cross reference.

NF point cross reference

PXR point position	PXR point name	Digitrip point position	General description	Function	Individual point description
27	CMM3	25			First Comm channel - receive positive
28	CMM4	26			First Comm channel - receive negative
29	PTVA	30	Power transformer	Required for voltage metering	Volt metering input A
30	PTVB	31			Volt metering input B
31	PTVC	32			Volt metering input C
32	PTVN	14			Volt metering input N
33	MODBA	N/A	ModBus communication	ModBus communication onboard trip unit	PXR onboard ModBus
34	MODBB	N/A			PXR onboard ModBus
35	MODBG	N/A			PXR onboard ModBus
36	ACCY4	N/A	Future	Future	Future
37	ACCY5	40	Latch check switch	Checks position of latch before closing	Latch check switch "common".
38	ACCY6	41			Latch check switch "make" (makes when mechanism is fully latched and ready to close).
39	ACCY7	42			Latch check switch "break" (brakes when mechanism is fully latched and ready to close).
40	SC	39	Electrical operator/ motor operator	Remote charging	Spring charge (E01 presented here when mechanism is charged).
41	E01+	37			Electric operator positive (charging motor)
42	E02-	38			Electric operator negative (charging motor)
43	SR1	35	Spring release	Remote closing	Spring release 1 (close coil)
44	SR2	36			Spring release 2 (close coil)
45	C1	43	Auxiliary switch 1	Indicates breaker open/closed status.	Aux switch 1 "common"
46	A1	44			Aux switch 1 "make" (makes when pole shaft is open).
47	B1	45			Aux switch 1 "break" (breaks when pole shaft is open).
48	B2	46	Auxiliary switch 2	Indicates breaker open/closed status.	Aux switch 2 "common"
49	C2	47			Aux switch 2 "make" (makes when pole shaft is open).
50	A2	48			Aux switch 2 "break" (breaks when pole shaft is open).
51	C3	49	Auxiliary switch 3	Indicates breaker open/closed status.	Aux switch 3 "common"
52	A3	50			Aux switch 3 "make" (makes when pole shaft is open).
53	B3	51			Aux switch 3 "break" (breaks when pole shaft is open).
54	B4	52	Auxiliary switch 4	Indicates breaker open/closed status.	Aux switch 4 "common"
55	C4	53			Aux switch 4 "make" (makes when pole shaft is open).
56	A4	54			Aux switch 4 "break" (breaks when pole shaft is open).

* Jumper wire must be installed between positions 11 and 12 if an external neutral current sensor is not installed.

Note: Shaded table cells indicate a position change. Digitrip point positions not listed are no longer used on NRX with PXR

Table 2. PXR/digitrip cross reference (cont.).

RF point cross reference

PXR point position	PXR point name	Digitrip point position	General description	Function	Individual point description
1	ST1+	1	Shunt trip	Remote tripping	Shunt trip positive

Table 2. PXR/digitrip cross reference (cont.).

RF point cross reference

PXR point position	PXR point name	Digitrip point position	General description	Function	Individual point description
2	ST2-	2			Shunt trip negative
3	UV1+	3	Under-voltage release	Remote tripping	UVR positive/second shunt trip positive
4	UV2-	4			UVR negative/second shunt trip negative
5	OT1C	5	Bell alarm 1	Indicates when breaker opens via the trip unit.	Over-current trip switch 1 common
6	OT1M	6			Over-current trip switch 1 "make" (makes when breaker trips).
7	OT1B	7			Over-current trip switch 1 "break" (breaks when breaker trips).
8	OT2B	8	Bell alarm 2	Indicates when breaker opens via the trip unit .	Over-current trip switch 2 "break" (breaks when breaker trips).
9	OT2C	9			Over-current trip switch 2 common
10	OT2M	10			Over-current trip switch 2 "make" (makes when breaker trips).
11*	N1	15	External neutral sensor	External neutral trip unit input	Neutral 1 (external neutral sensor "start lead").
12*	N2	16			Neutral 2 (external neutral sensor "finish lead").
13	ALMC	11	Alarm relay contacts	Alarm 1 - Maintenance mode is active. Alarm 2 - Hi-load alarm or ground alarm. Alarm 3 - Electronic OTS.	Alarm common "relay common"
14	ALM1	12			Alarm 1 "normally open contact" - remote indication of problem or maintenance mode is active
15	ALM2	13			Alarm 2 "normally open contact" - hi-load alarm (no GF) or ground alarm indication
16	ALM3	N/A			Alarm 3 "normally open contact" - electronic OTS
17	G1	17	External ground fault sensor	External ground fault sensor trip unit input	Ground 1 (external ground fault source sensor "start lead")
18	G2	18			Ground 2 (external ground fault source sensor "finish lead")
19	+24V	21	Trip unit auxiliary power	External trip unit power	+24 VDC
20	AGND	22	Analog ground	Ground contact for trip unit functions	Analog ground
21	ZIN	29	Zone selective interlocking	Selective coordination	Zone selective interlocking IN
22	ARMSIN	34	Maintenance mode	Low level instantaneous setting	Maintenance mode 2 (analog switch to activate maintenance mode)
23	ZCOM	28	Zone selective interlocking	Selective coordination	Zone selective interlocking common
24	ZOUT	27			Zone selective interlocking OUT
25	CMM1	23	Trip unit communications module #1	Trip unit communications	First Comm channel - transmit Positive
26	CMM2	24			First Comm channel - transmit negative
27	CMM3	25			First Comm channel - receive positive
28	CMM4	26			First Comm channel - receive negative
29	PTVA	30	Power transformer	Required for voltage metering	Volt metering input A
30	PTVB	31			Volt metering input B
31	PTVC	32			Volt metering input C
32	PTVN	14			Volt metering input N
33	MODBA	N/A	ModBus communication	ModBus communication onboard trip unit	PXR onboard ModBus

Table 2. PXR/digitrip cross reference (cont.).

RF point cross reference

PXR point position	PXR point name	Digitrip point position	General description	Function	Individual point description
34	MODBB	N/A			PXR onboard ModBus
35	MODBG	N/A			PXR onboard ModBus
36	2CMM2	N/A	Trip unit communications module #1	Trip unit communications	Second Comm channel - transmit negative
37	2CMM3	N/A			Second Comm channel - receive positive
38	2CMM4	N/A			Second Comm channel - receive negative
39	2CMM1	N/A			Second Comm channel - transmit positive
40	ARCON1	40	Arc flash detection system	Eaton arc flash protection system	ARCON
41	ARCON2	41			ARCON
42	ARCON3	42			ARCON
43	RR1	37	Remote reset trip indicator	Remote resetting of indicator	Remote reset trip indicator 1
44	RR2	38			Remote reset trip indicator2
45	-	N/A	Future	Future	Future
46	-	N/A	Future	Future	Future
47	-	N/A	Future	Future	Future
48	-	N/A	Future	Future	Future
49	LCC	55	Latch check switch (external)	Checks position of latch before closing	Latch check switch "common"
50	LCM	56			Latch check switch "make" (makes when mechanism is fully latched and ready to close).
51	LCB	54			Latch check switch "break" (breaks when mechanism is fully latched and ready to close).
52	SC	53	Electrical operator/motor operator	Remote charging	Spring charge (E01 presented here when mechanism is charged).
53	E01+	51			Electric operator positive (charging motor)
54	E02-	52			Electric operator negative (charging motor)
55	SR1	49	Spring release	Remote closing	Spring release 1 (close coil)
56	SR2	50			Spring release 2 (close coil)
57	C1	57	Auxiliary switch 1	Indicates breaker open/closed status	Aux switch 1 "common"
58	A1	58			Aux switch 1 "make" (makes when pole shaft is open).
59	B1	59			Aux switch 1 "break" (breaks when pole shaft is open).
60	B2	60	Auxiliary switch 2	Indicates breaker open/closed status	Aux switch 2 "common"
61	C2	61			Aux switch 2 "make" (makes when pole shaft is open).
62	A2	62			Aux switch 2 "break" (breaks when pole shaft is open).
63	C3	63	Auxiliary switch 3	Indicates breaker open/closed status	Aux switch 3 "common"
64	A3	64			Aux switch 3 "make" (makes when pole shaft is open).
65	B3	65			Aux switch 3 "break" (breaks when pole shaft is open).

Table 2. PXR/digitrip cross reference (cont.).

RF point cross reference

PXR point position	PXR point name	Digitrip point position	General description	Function	Individual point description
66	B4	66	Auxiliary switch 4	Indicates breaker open/closed status	Aux switch 4 "common"
67	C4	67			Aux switch 4 "make" (makes when pole shaft is open).
68	A4	68			Aux switch 4 "break" (breaks when pole shaft is open).
69	C5	69	Auxiliary switch 5	Indicates breaker open/closed status	Aux switch 5 "common"
70	A5	70			Aux switch 5 "make" (makes when pole shaft is open).
71	B5	71			Aux switch 5 "break" (breaks when pole shaft is open).
72	B6	72	Auxiliary switch 6	Indicates breaker open/closed status	Aux switch 6 "common"
73	C6	73			Aux switch 6 "make" (makes when pole shaft is open).
74	A6	74			Aux switch 6 "break" (breaks when pole shaft is open).
75	C7	75	Auxiliary switch 7	Indicates breaker open/closed status	Aux switch 7 "common"
76	A7	76			Aux switch 7 "make" (makes when pole shaft is open).
77	B7	77			Aux switch 7 "break" (breaks when pole shaft is open).
78	B8	78	Auxiliary switch 8	Indicates breaker open/closed status	Aux switch 8 "common"
79	C8	79			Aux switch 8 "make" (makes when pole shaft is open).
80	A8	80			Aux switch 8 "break" (breaks when pole shaft is open).
81	C9	81	Auxiliary switch 9	Indicates breaker open/closed status	Aux switch 9 "common"
82	A9	82			Aux switch 9 "make" (makes when pole shaft is open).
83	B9	83			Aux switch 9 "break" (breaks when pole shaft is open).
84	B10	84	Auxiliary switch 10	Indicates breaker open/closed status	Aux switch 10 "common"
85	C10	85			Aux switch 10 "make" (makes when pole shaft is open).
86	A10	86			Aux switch 10 "break" (breaks when pole shaft is open).
87	C11	87	Auxiliary switch 11	Indicates breaker open/closed status	Aux switch 11 "common"
88	A11	88			Aux switch 11 "make" (makes when pole shaft is open).
89	B11	89			Aux switch 11 "break" (breaks when pole shaft is open).
90	B12	90	Auxiliary switch 12	Indicates breaker open/closed status	Aux switch 12 "common"
91	C12	91			Aux switch 12 "make" (makes when pole shaft is open).
92	A12	92			Aux switch 12 "break" (breaks when pole shaft is open).
93	-	N/A	Future	Future	Future
94	-	N/A	Future	Future	Future
95	-	N/A	Future	Future	Future
96	-	N/A	Future	Future	Future

* Jumper wire must be installed between positions 11 and 12 if an external neutral current sensor is not installed.

Note: Shaded table cells indicate a position change. Digitrip point positions not listed are no longer used on NRX with PXR.

▲ IMPORTANT:

SHADED TABLE CELLS INDICATE A POSITION CHANGE. DIGITRIP POINT POSITIONS NOT LISTED ARE NO LONGER USED ON NRX WITH PXR.

Section 2: Removing drawout secondary terminal blocks

IMPORTANT:

KEEP IN MIND THAT SECONDARY TERMINAL BLOCKS ASSOCIATED WITH DRAWOUT CIRCUIT BREAKERS ARE DIN RAIL MOUNTED ON THE BREAKER'S DRAWOUT CASSETTE (FIGURE 2). ACCESSORY SECONDARY PLUGS PLUG INTO A SECONDARY PLUG HOUSING MOUNTED ON THE TOP FRONT OF THE CIRCUIT BREAKER. AS SUCH, SECONDARY CONNECTIONS ARE AUTOMATICALLY MADE OR DISCONNECTED DURING THE LEVERING (RACKING) PROCESS AS THE SECONDARY PLUG HOUSING ON THE BREAKER ENGAGES OR DISENGAGES THE SECONDARY TERMINAL BLOCKS MOUNTED ON THE DRAWOUT CASSETTE. FOR THIS REASON, ACCESSORY SECONDARY PLUGS DO NOT HAVE TO BE UNPLUGGED TO ADD OR REMOVE TERMINAL BLOCKS.

Note: A number of graphics in this instruction leaflet use the NF frame cassette for illustrative purposes only. The RF frame cassette is handled in a similar fashion.

Step 1. Become familiar with the drawout terminal block (see Figures 2 and 3) and the cassette's DIN rail mounting location.

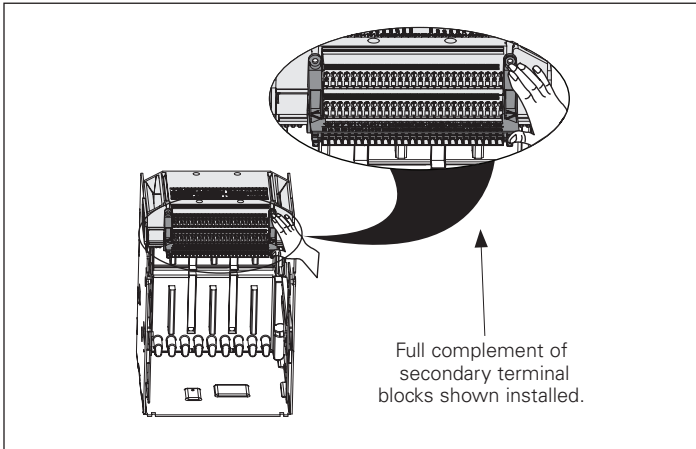


Figure 2. Cassette mounted terminal blocks (NF frame).

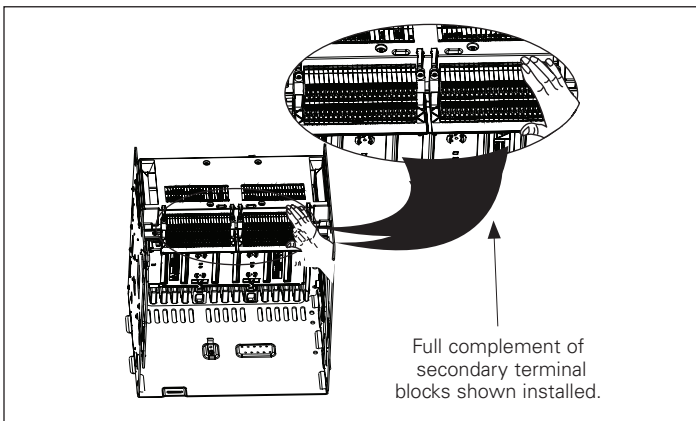


Figure 3. Cassette mounted terminal blocks (RF frame).

In addition, a terminal block alignment bracket is bolted in place to provide for proper alignment and separation of each individual terminal block during the levering (racking) process. Two alignment brackets are used with the RF frame cassette since two cradles are required to accommodate the additional terminal blocks (see Figures 4 and 5).

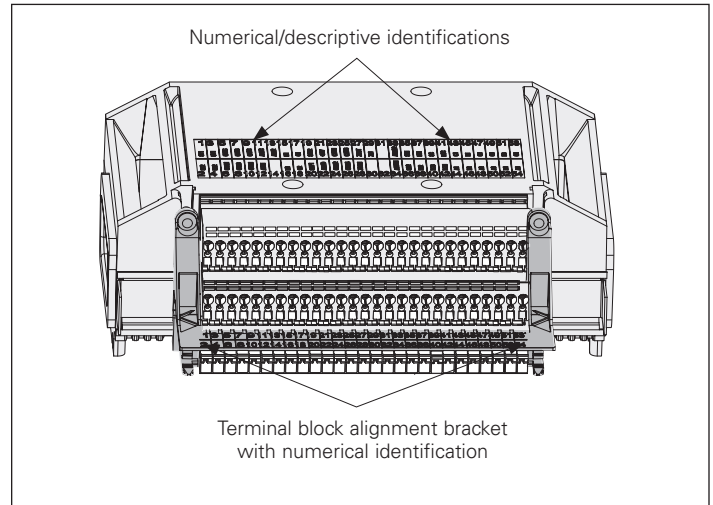


Figure 4. Installed terminal block alignment brackets (NF frame).

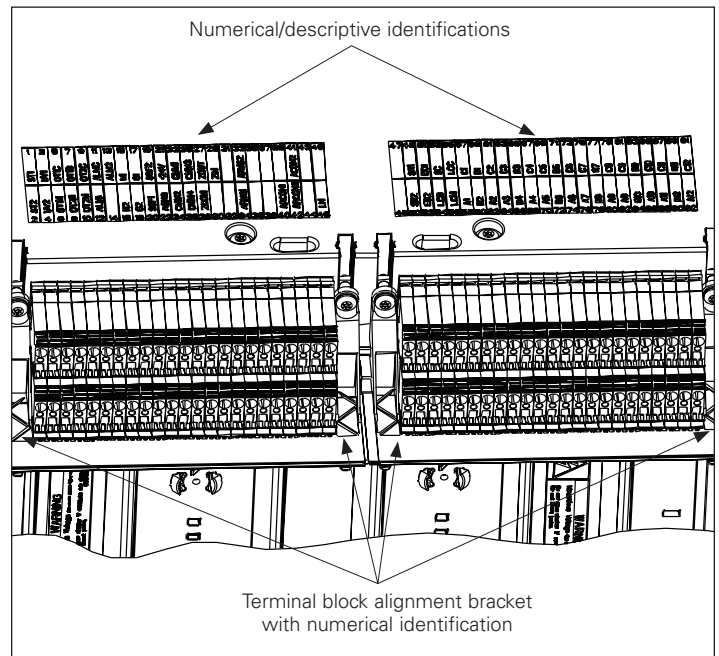


Figure 5. Installed terminal block alignment brackets (RF frame).

IMPORTANT:

SOME CONTROL WIRE ROUTING CHANGED BETWEEN DESIGNS. AS YOU REMOVE THE SECONDARY TERMINALS, MARK/LABEL THE WIRES CAREFULLY FOR FUTURE REFERENCE. SEE TABLE 2 IN SECTION 1.

Step 2. Use a #2 Phillips head screwdriver to remove the four mounting screws holding the terminal block alignment bracket in place.

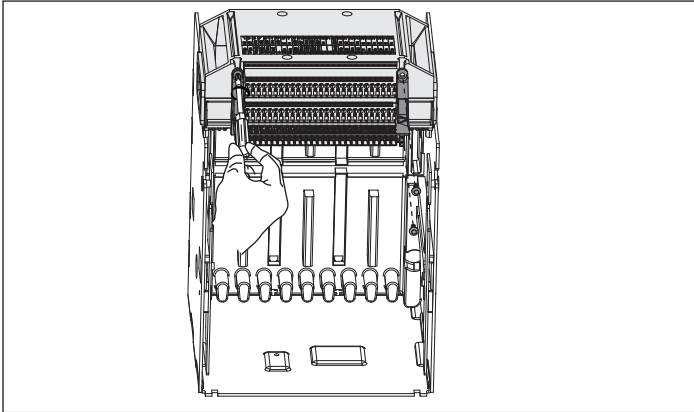


Figure 6. Removing the alignment bracket mount screws (NF frame).

Step 3. Carefully slide the alignment bracket out from between any mounted terminal blocks and discard it and its original mounting hardware.

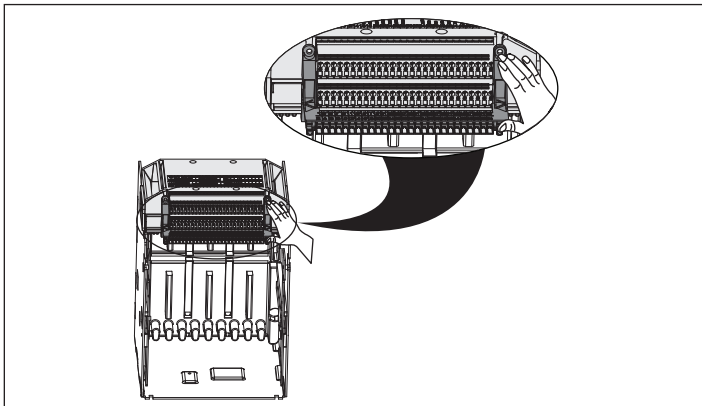


Figure 7. The terminal block alignment bracket (NF frame).

Step 4. Remove any terminal block by inserting a small screwdriver (1/8" / 3 mm) in the recessed area in the top front of the terminal block as shown (see Figure 8), and gently pry down to release and remove the block from the DIN rail.

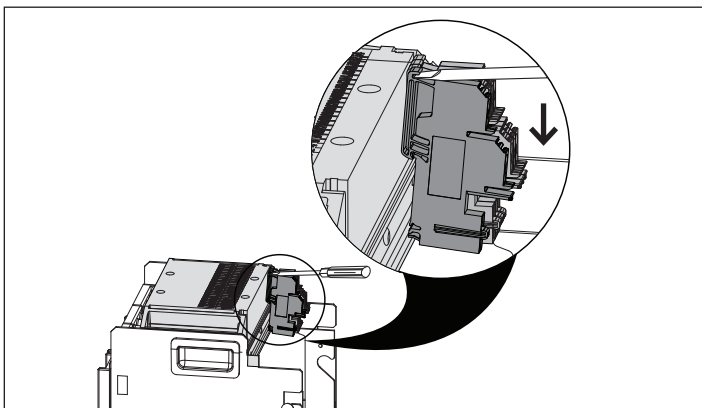


Figure 8. Removing the terminal blocks (NF frame).

Step 5. Repeat Step 4 until all Digitrip secondary terminal blocks are removed.

Section 3: Installing PXR (upgraded) drawout secondary terminal blocks

Step 1. Become familiar with the drawout terminal block (see Figure 9), the terminal block mounting bracket (see Figure 10), and the cassette secondary over label (Figure 11).

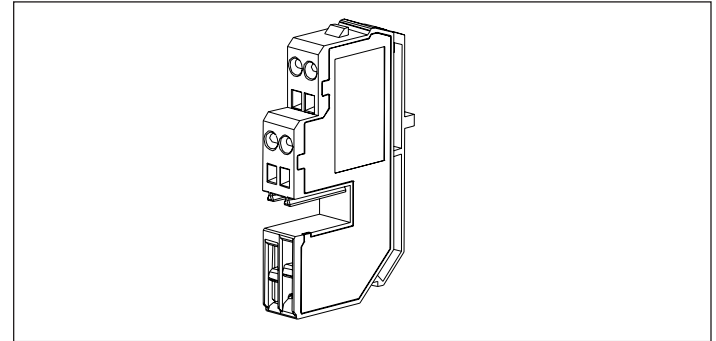


Figure 9. Drawout terminal block.

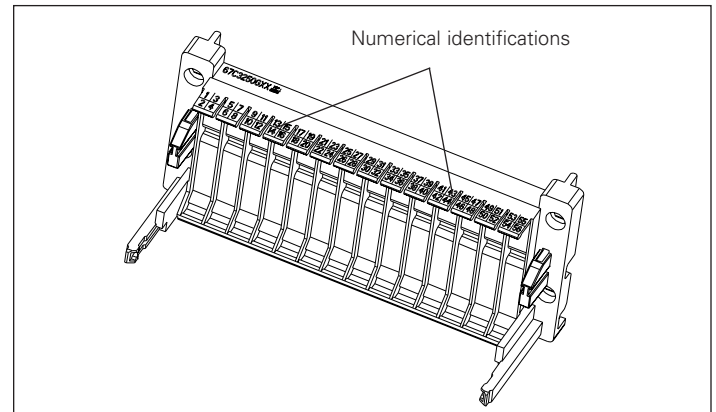


Figure 10. Drawout terminal block mounting bracket.

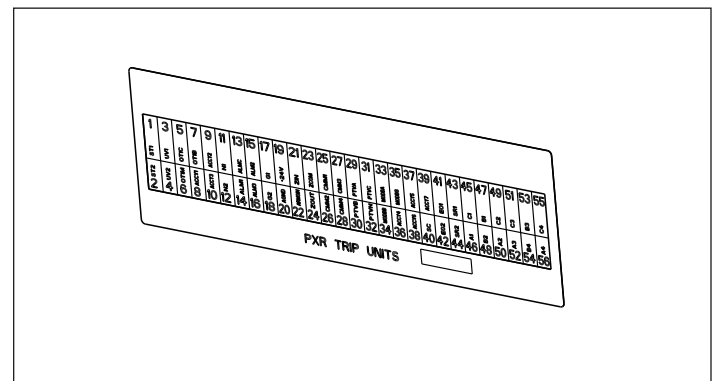


Figure 11. Cassette secondary over label.

The drawout terminal block and alignment bracket(s) for circuit breakers with PXR operate similarly to the previous parts in the drawout secondary kit for circuit breakers with Digitrip. Drawout terminal block brackets are supplied as part of the cassette and have etched numerical identifications. All of these identifications match the identifications on the breaker's secondary plug housing to ensure accurate terminal block placement.

Step 2. Install the terminal block mounting bracket(s) **(B)** onto the arc hood using a #2 Phillips head screwdriver. Place the cassette secondary over label **(E)** on top of the Digitrip secondary markings “molded in” to the arc hood. Align the label such that PXR markings line up with the locations on the terminal block mounting bracket.

Note: On the RF Frame, 2 over labels will be needed to cover the “molded in” markings on the arc hood.

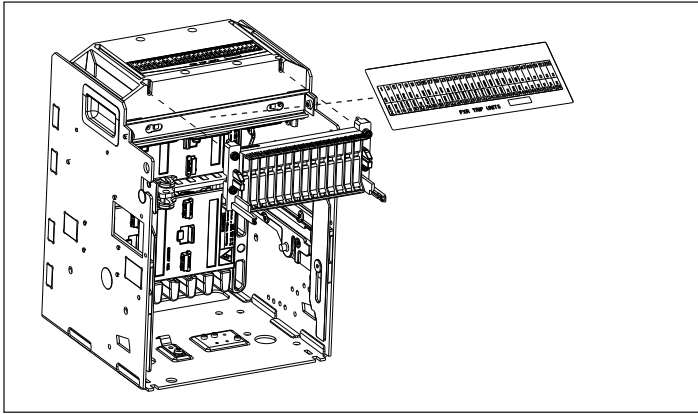


Figure 12. Terminal block mounting bracket and cassette secondary over label installation.

Step 3. Connect the bottom part of the terminal block **(A)** to the lower part of the mounting bracket. Ensure the terminal block is positioned accurately.

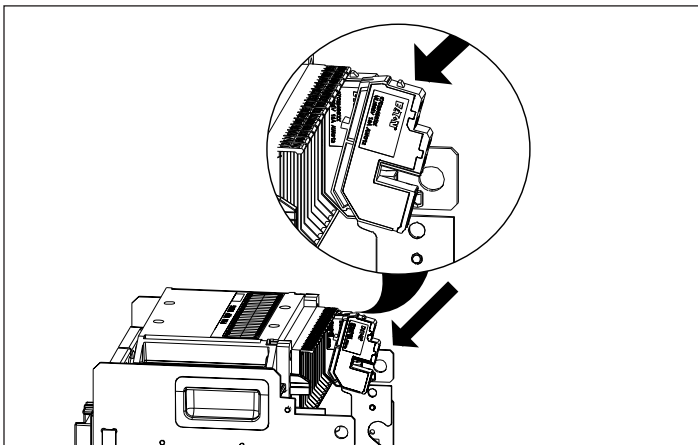


Figure 13. Connecting a terminal block (NF frame).

Step 4. Snap the top part of the terminal block onto the upper part of the mounting bracket. Ensure the terminal block is still positioned accurately and securely.

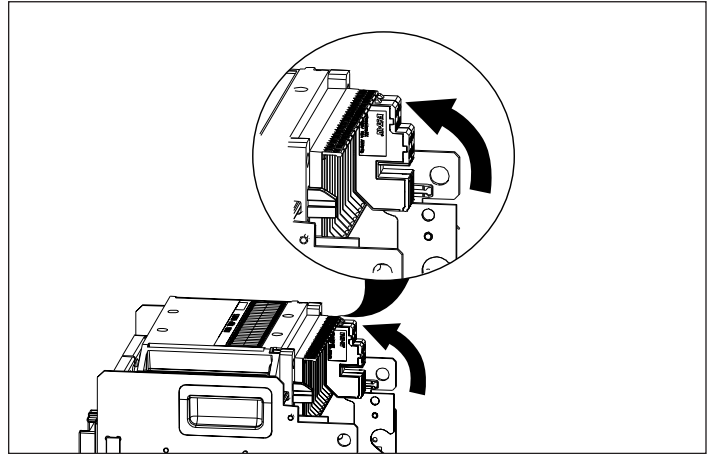


Figure 14. Snapping a terminal block into place (NF frame).

Step 5. Repeat Steps 3 and 4 until all terminal blocks are mounted, and check to ensure they are positioned in the correct locations. A small number of installed terminal blocks would look as shown in Figure 15.

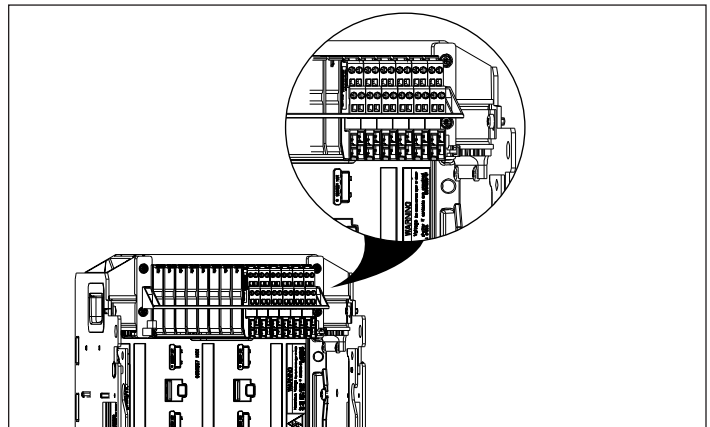


Figure 15. Breaker with some terminal blocks installed (NF frame).

Step 6. Push the terminal block alignment bracket **(C)** over the posts located on the terminal block mounting bracket. Ensure the alignment bracket is fully seated.

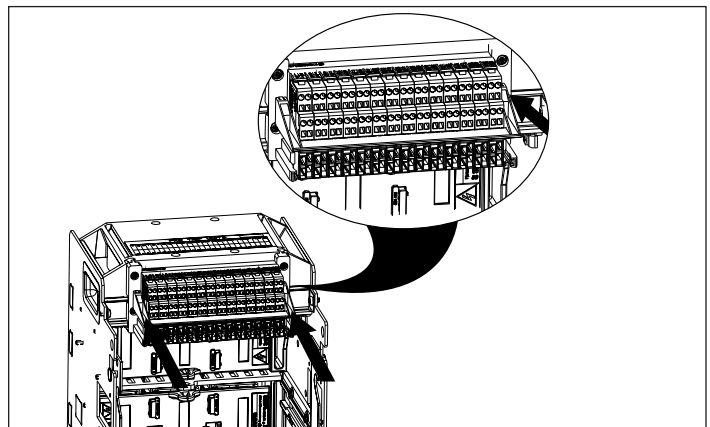


Figure 16. Installing the terminal block alignment bracket (NF frame).

Step 7. Once the terminal block alignment bracket is in place, inspect it from the bottom to ensure that the teeth on the bracket separate each individual terminal block. Only one installed terminal block should be visible between two teeth when the alignment bracket is properly positioned.

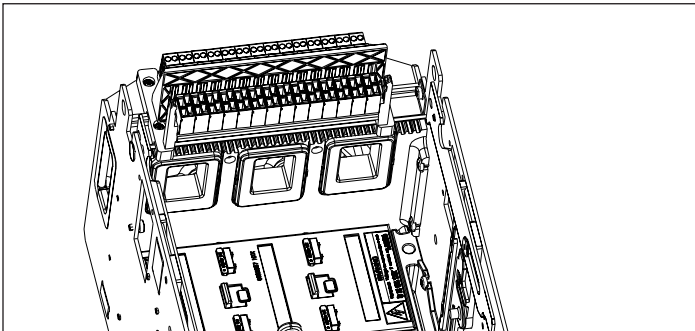


Figure 17. Inspecting the alignment bracket (NF frame).

Step 8. Install the provided jumper wire (D) between secondary terminal positions 11 (N1) and 12 (N2). If an external neutral current transformer is used with the cassette, then this step may be omitted and the jumper wire discarded.

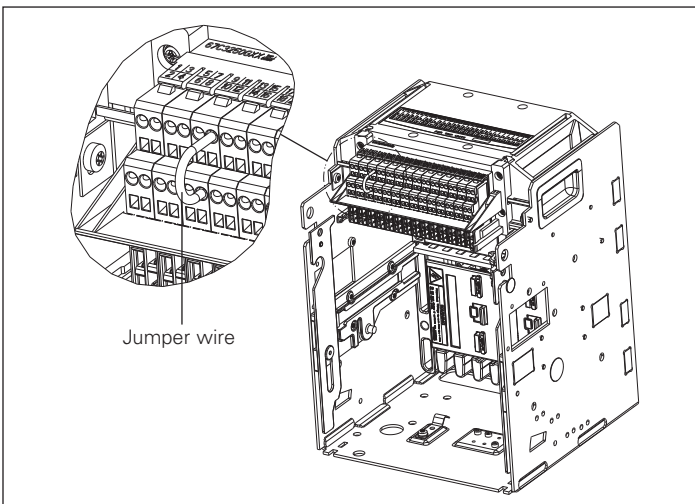


Figure 18. Installing the jumper wire (not needed in all cases) (NF frame).

Step 9. Since the cassette is now upgraded for use with the PXR trip unit, the cassette catalog # has changed. Please refer to Table 3 for details on the catalog number changes with the secondary terminal upgrade. A label (F) is provided to cover up the old cassette catalog number, replacing it with a new catalog # designation. Fill in the blank fields on the provided label (listed below).

- ORIGINAL CATALOG #;
- ORIGINAL CATALOG # DATE;
- RETROFIT CATALOG #; and
- RETROFIT CATALOG # DATE.

Table 3. Cassette catalog # cross reference.

Digitrip CAT #	PXR CAT #
NC	NA
NM or NE	NG
NX	NY
RE	RG
IZMX..	IZMX...-1

Note: There are two styles of the cassette catalog #'s. For the catalog # beginning with N or R, character "2" is the only character that changes when the cassette is upgraded for PXR. For the catalog # starting with IZMX, the original catalog # remains the same but, a "-1" is added to the end of the entire catalog number.

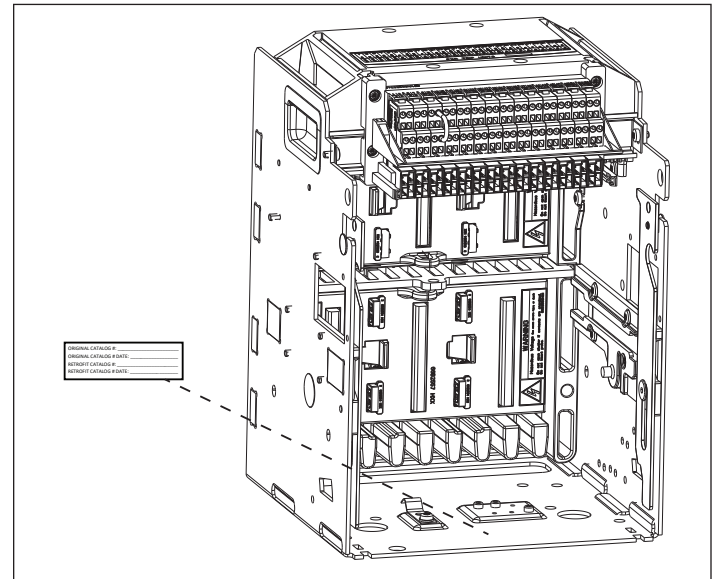


Figure 19. Installing the cassette catalog # over label.

Step 10. Secondary terminal installation is complete. Refer to Table 2 to find the updated location of control points and begin rewiring.

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