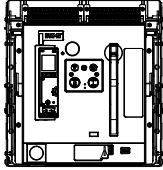


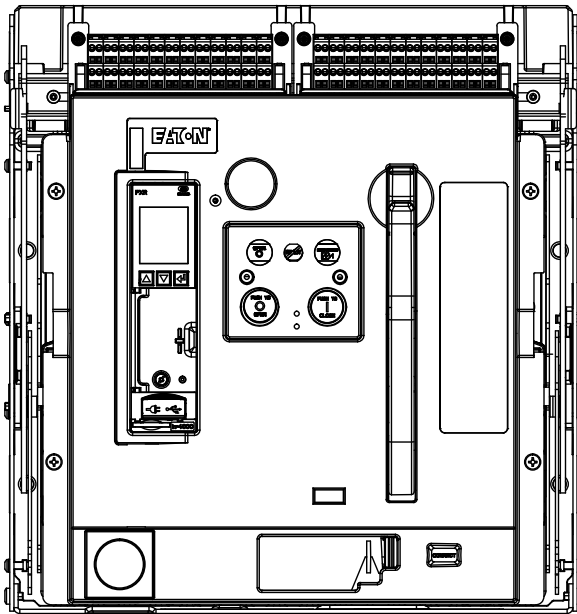
Instruction Manual MN013002EN

Series NRX with PXR - type RF low voltage power (air) circuit breakers instruction manual

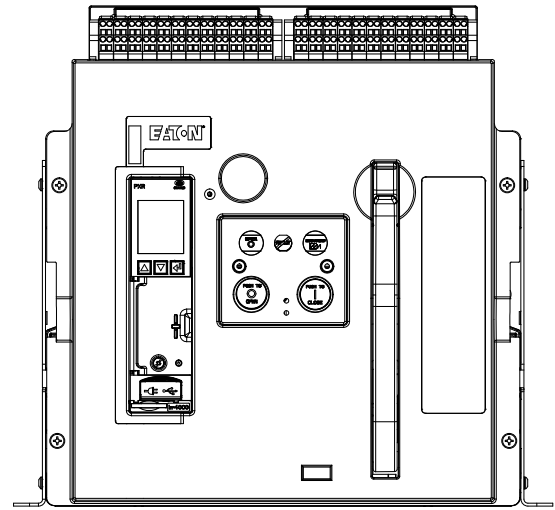
Instructions apply to:



UL489 series NRX RF frame
IEC IZMX40



Typical drawout circuit breaker and cassette



Typical fixed circuit breaker

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 **WARNING**

The warnings and cautions included as part of the procedural steps in this manual are for personnel safety and protection of equipment from damage. This example of a typical warning is intended to familiarize personnel with the style of presentation.

 **WARNING**

Series NRX circuit breakers are provided with safety features. Nevertheless, the voltages, currents, and power levels available around operational equipment are extremely dangerous. Under no circumstances should interlocks and other safety features be made inoperative, as this may result in death, bodily injury, or property damage.

 **WARNING**

Series NRX circuit breakers should not under any circumstances be applied outside their nameplate ratings. Operation outside of these ratings could result in death, bodily injury, or property damage.

 **WARNING**

Never attempt to disable any interlocks. Doing so could result in an electrical fault that could result in death, bodily injury, and/or equipment damage.

 **WARNING**

Failure to inspect, clean, and maintain circuit breakers can reduce equipment life or cause the equipment to not operate properly under faulty conditions. This could result in equipment damage, bodily injury, or even death.

 **WARNING**

Arc chutes and their cover plates must always be secured properly in place before a breaker is installed in its compartment. Failure to do so could result in equipment damage, bodily injury, or even death.

 **WARNING**

The circuit breaker mechanism contains stored mechanical energy and moving parts and should be operated with the front cover and arc chutes in place. Parts may move forcefully and without warning. If the front cover or arc chutes have been removed, limit contact to the handle and buttons. Failure to do so may result in serious bodily injury.

 **CAUTION**

Do not attempt to lift a breaker or cassette with ordinary crane hooks or chains. Damage to vital circuit breaker parts could result. Use two appropriate lifting straps when using any type of lifting device.

 **CAUTION**

Make certain that the cassette is properly mounted or seated securely on a work table before attempting to have the breaker fully extended on the cassette's drawout rails. Failure to comply could result in the cassette tipping forward resulting in equipment damage and/or bodily injury.

 **CAUTION**

Do not store equipment on its back. This could result in equipment damage.

 **CAUTION**

It is important to take care when placing a drawout circuit breaker on its extension rails. If the circuit breaker is not properly seated on the rails, the breaker could fall causing equipment damage and/or bodily injury.

 **CAUTION**

Inspection and maintenance procedures should be carried out only by personnel familiar with the hazards associated with working on power circuit breakers. Additionally, they should become familiar with the specifics associated with Series NRX circuit breakers as presented in this manual.

 **IMPORTANT**

Please read and understand these instructions before attempting to unpack, install, operate, or maintain this equipment. Study the breaker and its mechanism carefully before attempting to operate it on an energized circuit.

 **IMPORTANT**

A circuit breaker stored for any length of time should be operated a minimum of five times before it is placed in service.

 **IMPORTANT**

The circuit breaker mechanism is interlocked such that charged closing springs are automatically discharged if the circuit breaker is levered into or out of the cell. Discharge takes place between the DISCONNECT and TEST positions.

 **IMPORTANT**

Different degrees of access to push-buttons on the front of the circuit breaker can be achieved through the use of optional accessory devices.

 **IMPORTANT**

Before doing any work, make sure a drawout breaker is levered out to the TEST, DISCONNECT, or WITHDRAWN position. During the levering out and levering in of the circuit breaker, be aware of any signs that would indicate that the levering process is not working properly. If working on a fixed circuit breaker, bus systems should be de-energized for convenience and safety. All circuit breakers should be switched to the OFF position and the mechanism springs discharged.

Section 1: Introduction

Purpose

This instructional manual is intended to generally cover the installation, operation, and maintenance of Series NRX™ low voltage power (air) circuit breakers and drawout cassettes. Basic dimensional information is provided for the installation of both the circuit breaker and cassette.

Refer to other documentation for more specific details.

1. MN013003EN: Operating Manual for Series NRX PXR 20/25
2. AD013001EN: PXR 20/25 Time Current Curves
3. TD013001EN: Wiring Diagrams for PXR 20/25
4. Accessory field installation instruction leaflets (IL) dedicated to specific items are available for download at www.eaton.com/seriesnrx.
5. Visit www.eaton.com/seriesnrx for additional support documentation.

Safety

All safety codes, safety standards, and/or regulations must be strictly observed in the installation, operation, and maintenance of this equipment.



WARNING

The warnings and cautions included as part of the procedural steps in this manual are for personnel safety and protection of equipment from damage. This example of a typical Warning is intended to familiarize personnel with the style of presentation.



IMPORTANT

Please read and understand these instructions before attempting to unpack, install, operate, or maintain this equipment. Study the breaker and its mechanism carefully before attempting to operate it on an energized circuit.

All possible contingencies that may arise during installation, operation, or maintenance, and all details and variations of this equipment do not purport to be covered by these instructions. If further information is desired by purchaser regarding a particular installation, operation, or maintenance of particular equipment, contact the local Eaton representative.



WARNING

Series NRX circuit breakers are provided with safety features. Nevertheless, the voltages, currents, and power levels available around operational equipment are extremely dangerous. Under no circumstances should interlocks and other safety features be made inoperative, as this may result in death, bodily injury, or property damage.

Safe practices

To protect personnel associated with the installation, operation, and maintenance of this equipment, the following practices must be followed.

1. Only qualified electrical personnel familiar with the equipment, its operation, and the associated hazards should be permitted to work on, install, or operate the equipment.
2. Always be certain that the primary and secondary circuits are de-energized or the circuit breaker is open and removed to a safe work location before attempting any maintenance.
3. For maximum safety, only insert an open, completely assembled breaker into an energized cell.
4. Always ensure that drawout circuit breakers are in one of their designed cell positions, such as CONNECT, TEST, DISCONNECT, or WITHDRAWN. A circuit breaker permitted to remain in an intermediate position could result in control circuits being improperly connected, resulting in electrical failures.

Qualified personnel

For the purpose of operating and maintaining power circuit breakers, a person should not be considered qualified if the individual is not thoroughly trained in the operation of the circuit breaker and how it interfaces with the assembly in which it is used. In addition, the individual should have knowledge of the connected loads.

For the purpose of installing and inspecting circuit breakers and their associated assembly, a qualified person should also be trained with respect to the hazards inherent to working with electricity and the proper way to perform such work. The individual should be able to de-energize, clear, and tag circuits in accordance with established safety practices.

General information

The series NRX range of low voltage power (air) circuit breakers and switch-disconnectors are designed, manufactured, and tested for use in both switchboard and metal-enclosed switchgear assemblies in accordance with UL489 and IEC 60947-2 requirements. The series NRX range is manufactured and tested in an ISO 9001 certified facility.

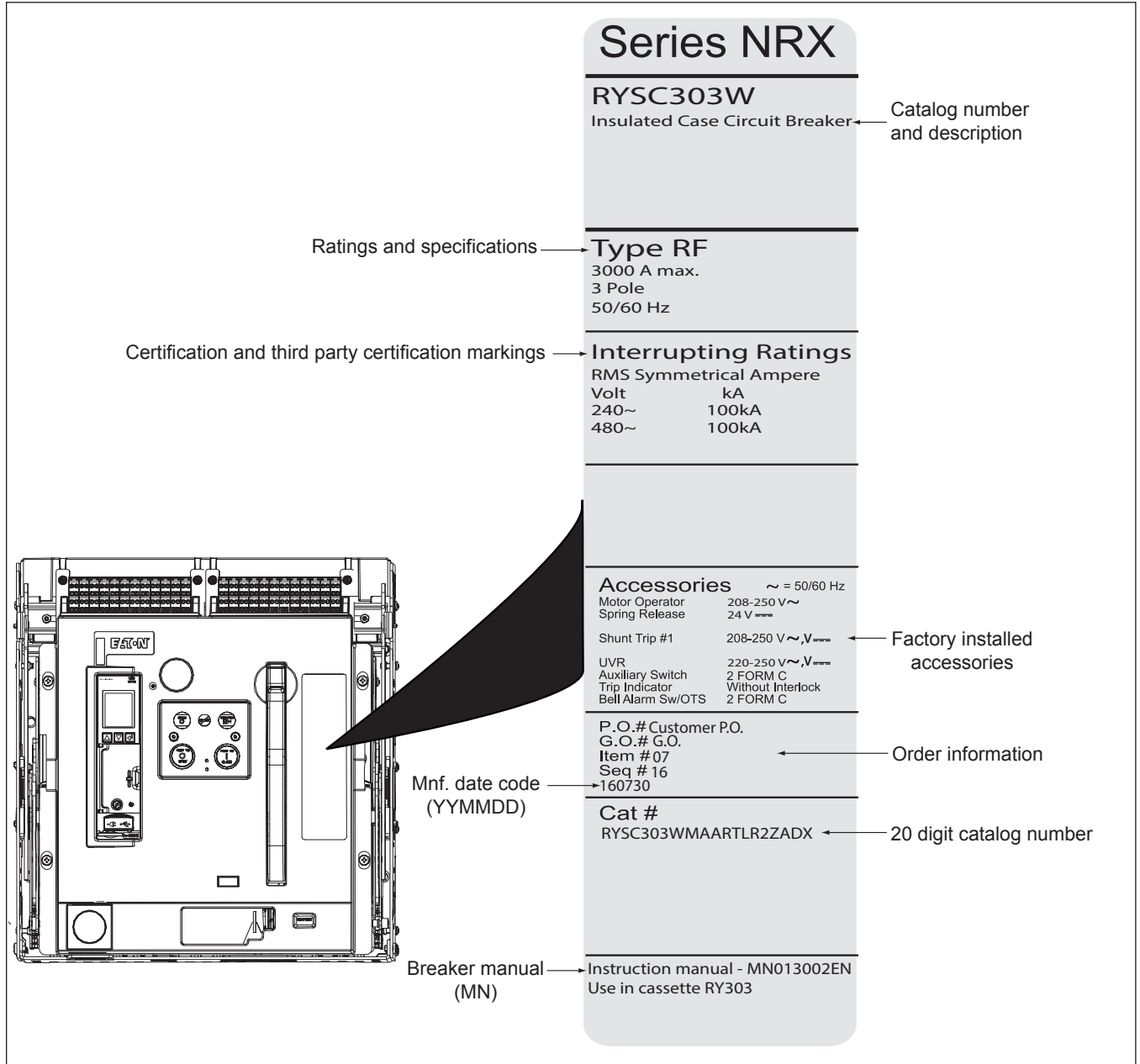
Series NRX circuit breakers and switch-disconnects are available in fixed and drawout mounting configurations and offer a variety of different connection solutions. The fixed configuration is designed for rear bus connections. The drawout version, in conjunction with its drawout cassette, is a through-the-door design having three breaker positions with the compartment door closed (CONNECT, TEST, DISCONNECT) and one position out of its compartment on extension rails (WITHDRAWN). A drawout cassette is also designed for rear bus connections. Continuous current ratings from 800 - 4000 A and interruption capacities up to 105 kA are available depending on the applicable standard. All series NRX circuit breakers are 100 percent rated.

Product labeling and identification

The circuit breaker nameplate, located on the right side of the breaker, provides complete rating information and should always be inspected to ensure the information shown is in keeping with the product ordered (Figure 1). Become familiar with the nameplate.

WARNING
Series NRX circuit breakers should not under any circumstances be applied outside their nameplate ratings. Operation outside of these ratings could result in death, bodily injury, or property damage.

Figure 1. Series NRX nameplate location.



The circuit breaker configuration is fully described by a 20-digit catalog number located on the name plate. The drawout cassette can be identified by a 14-digit catalog number. An overview of the Catalog number code can be found in the catalog at www.eaton.com/seriesnrx. Individual circuit breakers are identified by the order information: G.O., Item, and Sequence numbers. Taken together, these are equivalent to a serial number

Breaker overview

Figures 2 through 5 highlight the main components that make up a series NRX breaker.



WARNING

The circuit breaker mechanism contains stored mechanical energy and moving parts and should be operated with the front cover and arc chutes in place. Parts may move forcefully and without warning. If the front cover or arc chutes have been removed, limit contact to the handle and buttons. Failure to do so may result in serious bodily injury.

Drawout breaker and cassette

A drawout circuit breaker is used in combination with a drawout cassette (Figures 2 and 3). Mounted on the drawout breaker are the primary disconnect finger clusters and levering mechanism. These components are located on the breaker to allow Users easy access when performing product inspection or maintenance. The cassette provides all the necessary drawout circuit breaker interfaces, including primary and secondary connections. Standard flat terminal pads on the rear of the cassette provide for a variety of primary connection configurations. Optional primary adapters are available for front and rear bus or cable connections. For specific details and mounting instructions for primary adapters, refer to www.eaton.com/seriesnrx.

Fixed circuit breaker

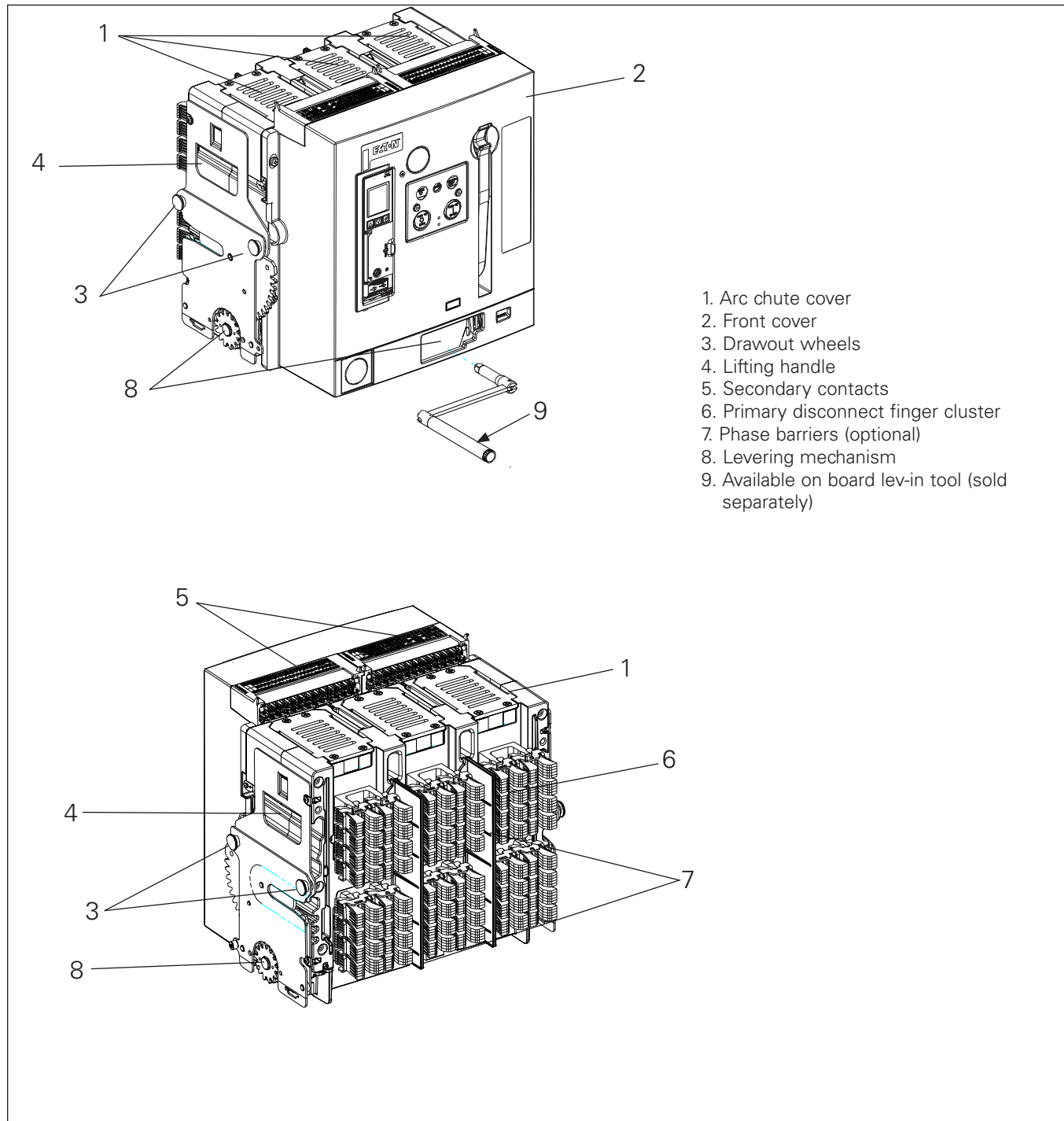
A fixed circuit breaker is rigidly mounted in its structure with no drawout feature. The circuit breaker is available in front and rear-connected configurations (Figure 4).

The breaker can be mounted on a suitable horizontal mounting surface using left and right-side mounting feet. A standard fixed circuit breaker is supplied with flat primary terminal pads on the rear of the breaker that will accommodate a variety of primary connection configurations.

Refer to Section 5 and 6 for mounting and installation dimensional information. Electronic files of dimensional drawings for customer use are available for download at www.eaton.com/seriesnrx.

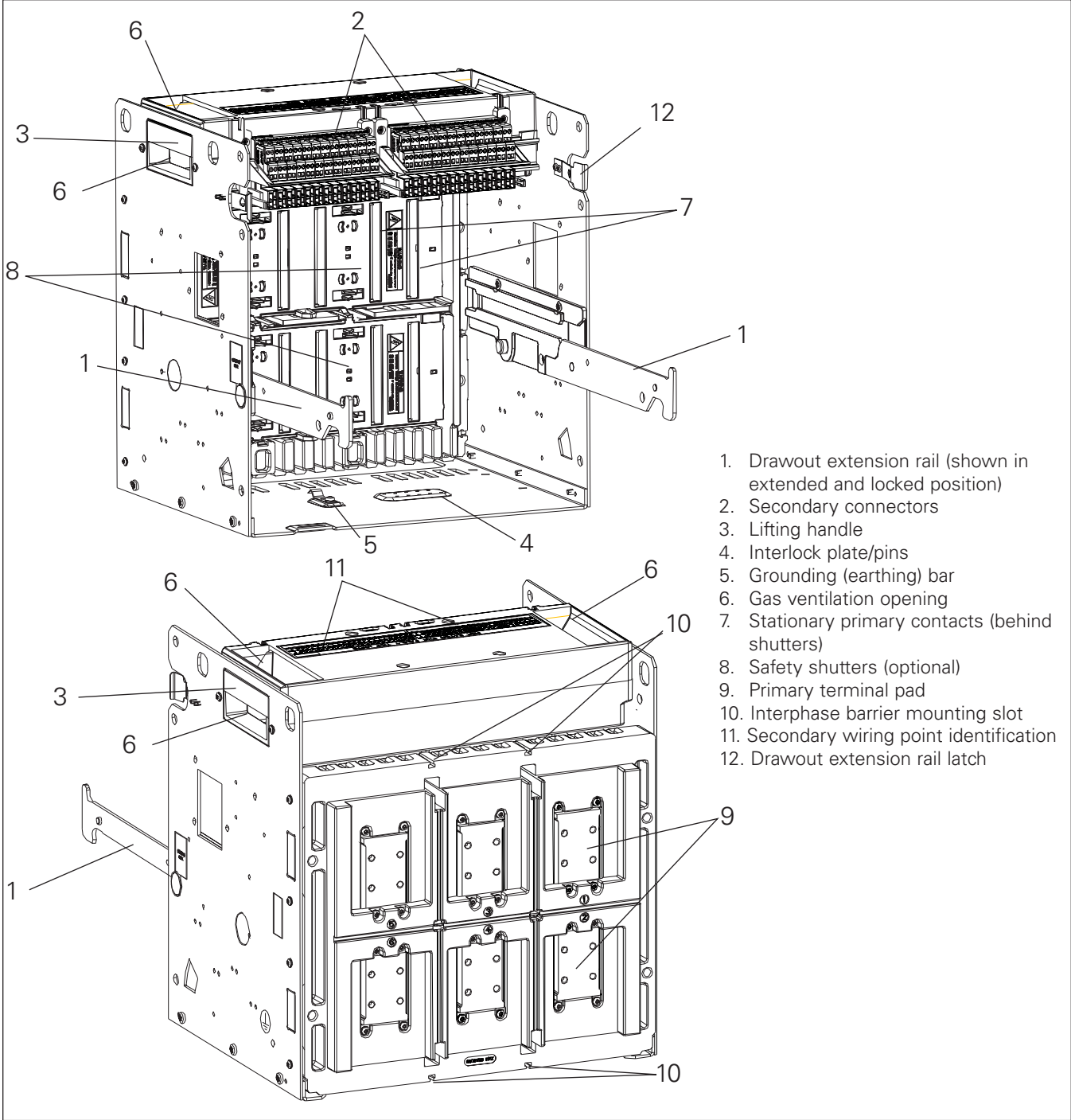
Section 1: Introduction

Figure 2. Typical NRX type RF drawout circuit breaker.



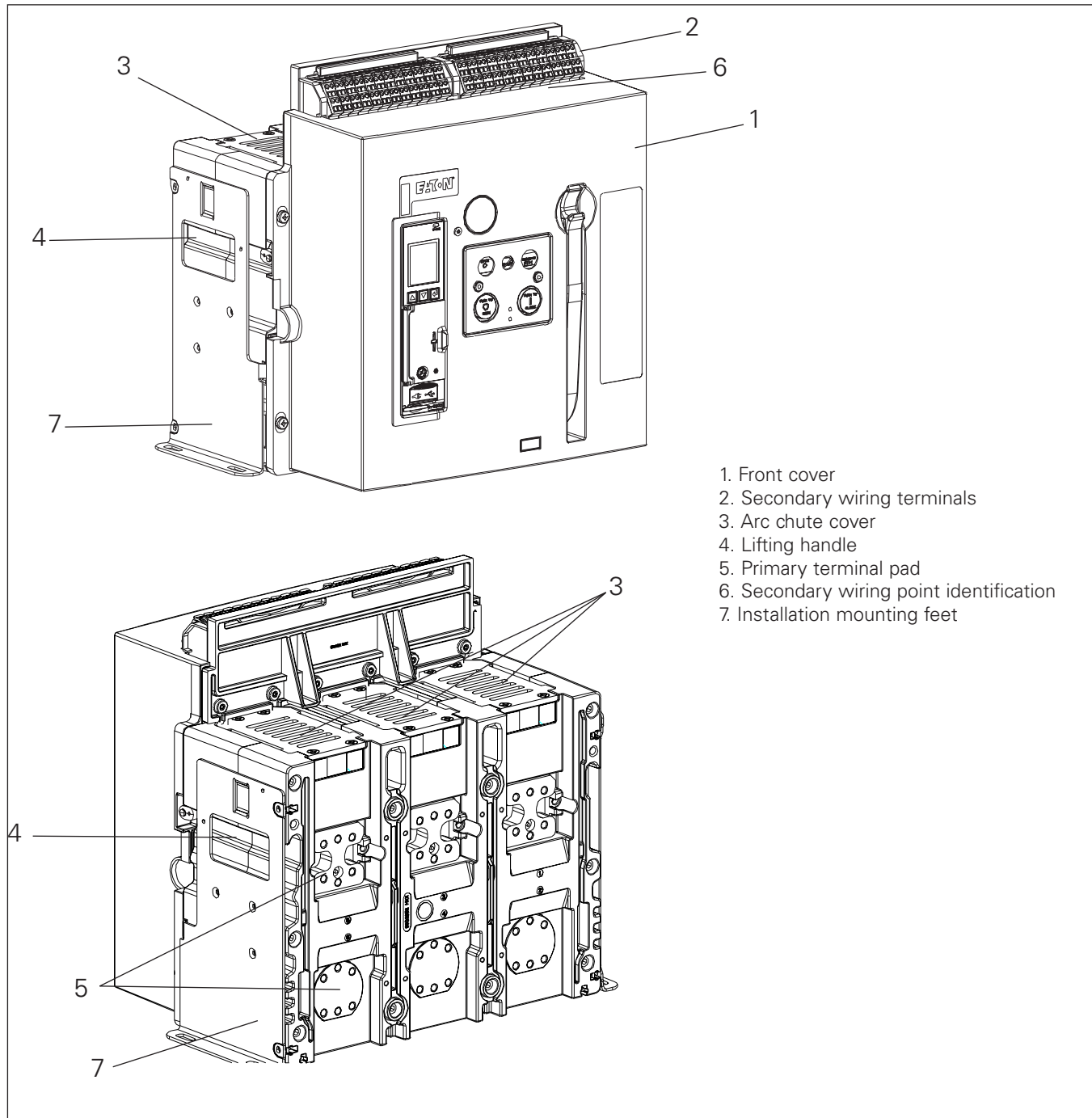
Note: Refer to Figure 5 for more visual details of front cover.

Figure 3. Typical NRX type RF drawout cassette.



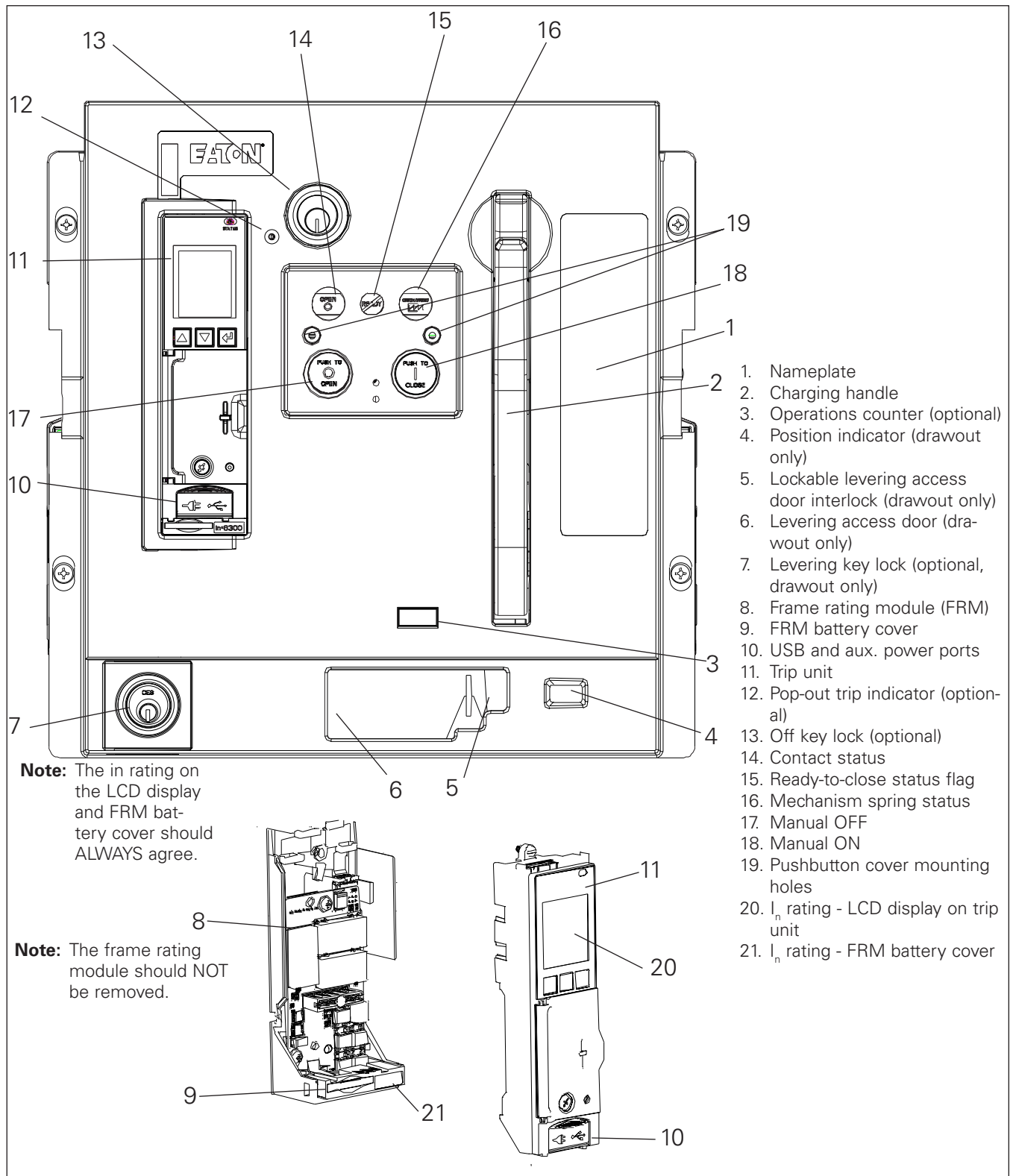
Section 1: Introduction

Figure 4. Typical NRX type RF fixed circuit breaker.



Note: Refer to Figure 5 for more visual details of front cover.

Figure 5. Typical NRX type RF drawout circuit breaker front cover.



Section 2: Receiving, unpacking, and inspection

Section 2: Receiving, unpacking, and inspection

Suggested tools

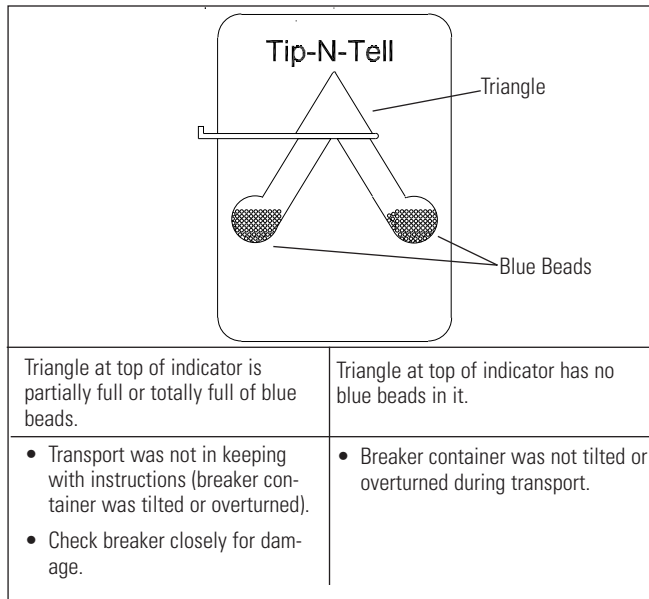
- Flat-blade/Phillips head screwdrivers
- 3/8-inch levering tool or extension/ratchet
- 5 mm Allen head screwdriver
- 1/2 inch socket and ratchet or 1/2 inch wrench

Circuit breaker unpacking and inspection

Inspect shipping containers for obvious signs of external damage. Record any observed damage for reporting to the transportation carrier and Eaton. All reports and claims should be as specific as possible and include the order number and other applicable nameplate information.

Note: The outside of the circuit breakers shipping container includes a transport “Tip-N-Tell” indicator alerting the receiver as to whether or not the shipping container was transported and handled in the required manner. Refer to Figure 6 for details about the indicator before removing the circuit breaker from its container.

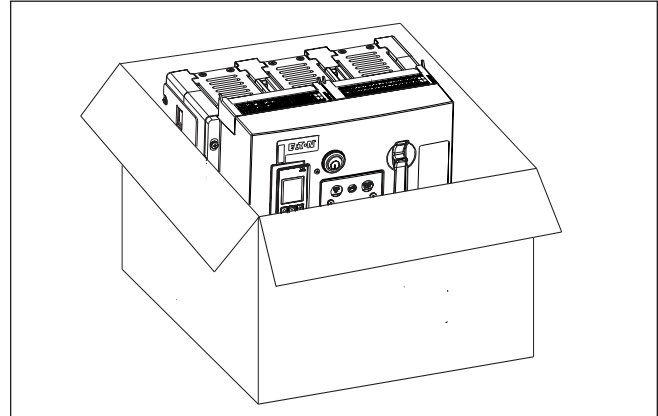
Figure 6. Transport indicator.



When ready to inspect and/or install a Series NRX circuit breaker, proceed with the following steps:

Step 1: Carefully open container and remove all packing/shipping material and documentation.

Figure 7. Step 1.



Note: Also follow Step 1 when handling a separately shipped drawout cassette.

Step 2: Save all packing/shipping material and documentation for future shipments or breaker storage purposes.

Step 3: Move the breaker to a convenient place for closer examination. Drawout breakers are provided with a lifting handle on both sides to assist lifting.

Use an appropriate device to lift the breaker or cassette (Figure 9). If one is not available, it is recommended that a minimum of two people be used to lift/move a breaker or cassette.

Note: Refer to Figure 9 for additional precautions and lifting procedures.

Step 4: Repeat Step 3 for a drawout cassette. The cassette is provided with a lifting indentation on each side.

Figure 8. Step 3.

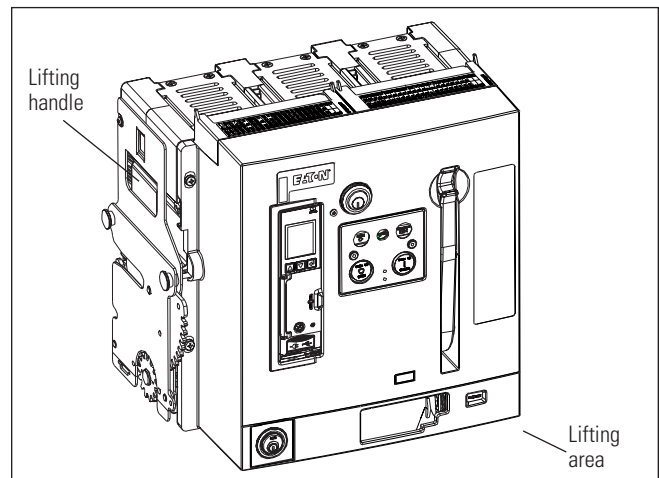
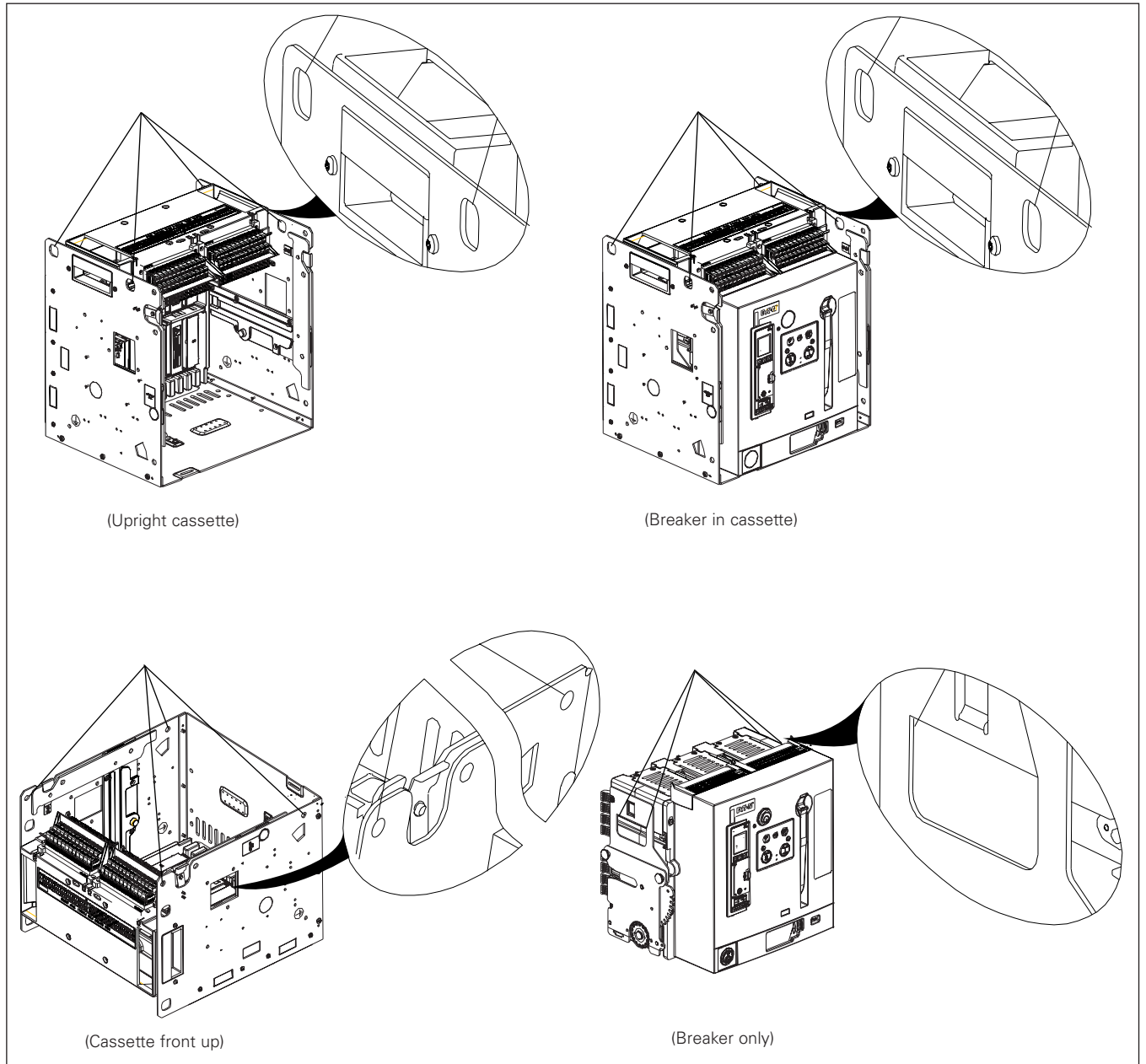


Figure 9. Suggested lifting procedures and precautions



Note: When using an appropriate lifting device, attach the lifting harness in the locations shown in Figure 9 that best fits the circumstances.