

**Technical Data and Specifications****General**

- A. The Contractor shall furnish and install deadfront loadcenters incorporating circuit breakers of the number, rating and type as specified herein and as shown on the contract drawings.
- B. The loadcenter and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of UL, NEMA and NEC including:
  1. UL 67—Standards for Panelboards.
- C. UL 50—Standards for Cabinets and Boxes.
- D. UL 489—Standards for Molded Case Circuit Breakers.
- E. UL 869—Standards for Service Equipment.
- F. Federal Specification W-C 375B—Circuit Breakers.
- G. Federal Specification W-C P115b—Panel Power Distribution Type 1, Class 2.

**Qualifications**

- A. The manufacturer of the loadcenter shall be the manufacturer of the circuit breaker within the loadcenter.
- B. For the equipment specified herein, the manufacturer shall be ISO 9000 certified.
- C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of seven (7) years.

**Manufacturers**

- A. Eaton.

**Ratings**

- A. Loadcenters shall be rated for 120/240 Vac and shall have short-circuit ratings as shown on the drawings or as herein scheduled, but not less than 10,000 amperes rms symmetrical.
- B. Circuit breakers shall be a minimum of 125 A frame. Circuit breakers 15 through 125 A trip size shall take up the same pole spacing.
- C. Loadcenters shall be labeled with a UL short-circuit rating. When series combination ratings are applied with integral or remote upstream devices, a label shall be provided. Series combination ratings shall cover all trip ratings of installed frames. It shall state the conditions of the UL series ratings including:
  1. Size and type of upstream device.
  2. Branch devices that can be used.
  3. UL series short circuit rating.

**Construction**

- A. All interiors, with the exception of the branch circuit breakers, shall be completely factory assembled with main breakers, main lugs, or no main device.
- B. Interiors shall be designed so that circuit breakers can be replaced without disturbing adjacent units and without removing the main bus connectors and shall be designed so that circuits may be changed without machining, drilling, or tapping.

- C. Physical means shall be provided to prevent the installation of more overcurrent devices than that number for which the enclosure was designed, rated and approved. Half-size breakers shall have a UL listed rejection tab over the line terminals. Loadcenter interiors must have notched stabs to accept these rejection tab class CTL breakers, if required and approved.

**Bus**

- A. Busbars for the main and cross connectors shall be [tin-plated aluminum] [copper] in accordance with Underwriters Laboratories standards. Busing shall be braced throughout to conform to industry standard practice governing short-circuit stresses in loadcenters.

**Note:** Note to spec writer—select one (copper available in limited ratings).

- B. Neutral busing shall have a suitable lug for each outgoing feeder requiring a neutral connection of same ampacity as branch.

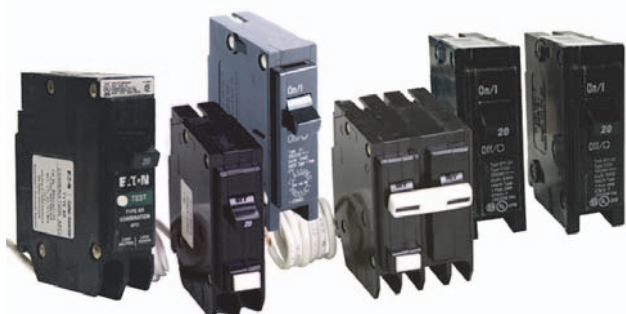
**Wiring/Termination**

- A. All wire connectors and terminals shall be of the anti-turn solderless type and shall be suitable for copper or aluminum wire of the sizes indicated. All connectors must meet the "Requirements for Wire Connectors and Soldering Lugs" as stated in UL 486B.
- B. All loadcenters where marked shall be suitable for use with 60 °C or 75 °C rated wire.

**Circuit Breakers**

- A. Circuit breakers shall be molded case type. Circuit breakers shall have four-rivet construction (GFI Type—5 rivets). Multipole circuit breakers shall be of a stack pole design to provide electrical phase isolation.
- B. Each pole of the circuit breaker will provide inverse time delay overload and instantaneous short-circuit protection by means of both thermal and magnetic sensors.
- C. The circuit breaker calibration shall not be affected by environmental changes in relative humidity. The thermal bimetal element shall be welded to the steel frame and calibration shall be set independent of the molded case by computer controlled equipment.
- D. All circuit breakers shall be operated by a toggle-type handle and multipole circuit breakers shall have an internal common trip mechanism. The circuit breakers shall incorporate trip mechanisms that are mechanically trip-free from the handle. The handle position shall provide visual trip indication.
- E. Contacts shall be of non-welding silver alloy.
- F. All circuit breakers shall have the trip rating inscribed on the handle on each circuit breaker pole. Also, unique color-coded cases that indicate the UL listed 10 kA or 22 kA interrupting ratings. Breakers shall be able to be used as main or branch disconnect devices.

**BR Circuit Breakers**



### BR Circuit Breakers

#### Product Description

**Plug-On Branch Feeder Type Arc Fault Circuit Breakers, Type BR—10 kAIC, 120 Vac and 120/240 Vac**

A branch feeder type arc fault circuit interrupter is a device intended to mitigate high current arcing faults in the complete circuit, including connected cords. High current arcing faults can occur from line to neutral or line to ground. These arcing faults are in parallel with the load and produce the most energy of all arcing faults.

The branch feeder type AFCI is required in the 1999 and 2002 National Electrical Code.

The Combination Type AFCI is required in the 2005, 2008, and 2011 National Electrical Code.

**Plug-On Combination Type Arc Fault Circuit Breakers, Type BR—10 kAIC, 120 Vac and 120/240 Vac**

A combination type arc fault circuit interrupter is a device that includes all of the protection offered by the branch feeder AFCI (mitigation of high current arcing faults in the complete circuit, including connected cords). In addition it provides direct detection of persistent low current arcing faults down to 5 amps with associated mitigation of fire hazards in the cords connected to the outlets. High current arcing faults can occur from line to neutral or line to ground. These arcing faults are in parallel with the load and produce the most energy of all arcing faults. The current level of low current arcing faults is limited by the load.

### Contents

<i>Description</i>	<i>Page</i>
Overview . . . . .	<b>V1-T1-42</b>
BR Specialty Products	
BR Quick Connect Neutral Loadcenters . . . . .	<b>V1-T1-57</b>
Spa Panels . . . . .	<b>V1-T1-58</b>
Riser Panel . . . . .	<b>V1-T1-59</b>
Type BR Renovation Loadcenter . . . . .	<b>V1-T1-60</b>
Type BR Mechanical Interlock Kits . . . . .	<b>V1-T1-62</b>
Type BR Retrofit Interior Kits . . . . .	<b>V1-T1-73</b>
BR Circuit Breakers	
Product Selection . . . . .	<b>V1-T1-77</b>
Circuit Breaker Accessories . . . . .	<b>V1-T1-85</b>
Wiring Diagrams . . . . .	<b>V1-T1-87</b>

**Plug-On Ground Fault Circuit Breakers, Type GFCB and GFEP—10/22 kAIC, 120 Vac and 120/240 Vac**

**Ground Fault**

**Application Notes**

Single-pole GFCBs are designed for use in two-wire, 120 Vac circuits. See **Page V1-T1-87** for a typical wiring configuration.

Two-pole GFCBs are designed for use in three-wire, 120/240 Vac circuits, 120 Vac multiwire circuits employing common, neutral and two-wire, 240 Vac circuits obtained from a 120/240 Vac source.

**Page V1-T1-87** shows typical wiring configurations for a 120/240 Vac multiwire circuits, and a 240 Vac, two-wire circuit. Note the “panel neutral” conductor connects to the neutral bar, even though the neutral is not included in the load circuit. This connection is necessary to supply a 120 Vac power source to the ground fault sensing circuit.

The figures are shown with a 120/240 Vac, single-phase, three-wire power source, but are also applicable to a 120/208 Vac, three-phase, four-wire power supply. For all figures, the electrical operation of the GFCB is not affected by the equipment ground.

**Non-CTL Plug-On Replacement—Circuit Breakers, Type BRD—10 kAIC, 120/240 Vac**

**Non-CTL 10 kAIC for Replacement Purposes Only**

For replacement in enclosures manufactured prior to 1968 with unnotched stabs. Circuit breakers do not have rejection tab.

### Product Selection

Plug-On Circuit Breakers, Types BR—10/22/42 kAIC, 120 Vac, 120/240 Vac and 240 Vac

BR120



BR215



BR320



BRH2100



BRX2125



### Type BR Breakers, 1-Inch (25.4 mm) per Pole 120/240, 10, 22 and 42 kAIC

Ampere Rating	Wire Size Range Cu/Al 60 °C or 75 °C	Single-Pole 120/240 Vac Requires One 1-Inch (25.4 mm) Space		Two-Pole 120/240 Vac Common Trip Requires Two 1-Inch (25.4 mm) Spaces			
		10 kAIC Catalog Number	22 kAIC Catalog Number	5 per Shelf Carton		42 kAIC Catalog Number	65 kAIC Catalog Number
10	#14-4	BR110	—	BR210	—	—	—
15	#14-4	BR115 ①②	BRH115	BR215 ③	BRH215	—	—
20	#14-4	BR120 ①②	BRH120	BR220 ③	BRH220	—	—
25	#14-4	BR125	BRH125	BR225 ③	BRH225	—	—
30	#14-4	BR130	BRH130	BR230 ③	BRH230	—	—
35	#14-4	BR135	BRH135	BR235 ③	BRH235	—	—
40	#14-4	BR140	BRH140	BR240 ③	BRH240 ③	—	—
45	#14-4	—	BRH145	BR245 ③	BRH245	—	—
50	#14-4	BR150	BRH150	BR250 ③	BRH250 ③	—	—
55	#14-3	BR150	BRH155	BR255	BRH255	—	—
60	#8-1/0	BR160	BRH160	BR260	BRH260	BRHH260	BRX260
70	#8-1/0	BR170	BRH170	BR270	BRH270	BRHH270	BRX270
80	#8-1/0	—	—	BR280	BRH280	BRHH280	BRX280
90	#8-1/0	—	—	BR290	BRH290	BRHH290	BRX290
100	#8-1/0	—	—	BR2100	BRH2100	BRHH2100	BRX2100
110	#8-1/0	—	—	BR2110	BRH2110	BRHH2110	BRX2110
125	#4-2/0	—	—	BR2125	BRH2125	BRHH2125	BRX2125
150	#4-2/0	—	—	BR2150 ④	—	—	—



#### Notes

- ① One pole, 1-inch (25.4 mm) per pole circuit breakers are available with high magnetic setting for switching large tungsten lamp loads. Add suffix H to catalog number.
- ② Switching duty rated.
- ③ On the black handle breaker, add suffix "B" to the catalog number to obtain a tapped molded opening for proper use with hold-down kits.
- ④ For use as a branch circuit breaker in 400 and 600 ampere panels only.

All Type BR single-, two- and three-pole circuit breakers carry listing for HACR application. For circuit breakers with a shunt trip, add ST suffix.