

# Loadcenters and Circuit Breakers

Residential Loadcenters and Breaker Family



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**Eaton Type CH Convertible Family**



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**Overview**

**Product Selection Guide**

**CH Loadcenters**

**Description**

**Service**

Single-phase, three-wire, 120/240 Vac	Three-phase, four-wire, 208Y/120 Vac
Three-phase, three-wire, 240V corner grounded delta (see Accessories <b>Page 26</b> )	Three-phase, three-wire, 240 Vac delta

**Short-Circuit Current Rating**

10 kAIC: All single- and three-phase loadcenters 40–400A, 2–42 circuits except when series ratings are applied	35 kAIC: All convertible and factory-installed main breakers single-phase loadcenters rated 150–225A using Type CSH main breakers
	42,000 and 100,000 are available on some styles: single-phase and three-phase

**Main Breaker/Main Lug Loadcenters**

Single-phase	Three-phase
Main breaker: 100, 125, 150, 200, 225, 400A	Main breaker: 150, 200, 225, 300, 400A
Main lugs: 40, 70, 125, 150, 200, 225, 400A	Main lugs: 125, 150, 200, 225, 400A

**Convertible Loadcenters**

Main breaker or main lugs: single-phase up to 225A

**Branch Breakers**

Type CH: 10–150A. Single-, two- and three-pole. Selected amperages available in shunt trip, HACR and switching duty	Type CH-AFCI arc fault circuit interrupter
Ground fault circuit interruptors: 15–60A	Type CHP: 10–125A. Single-, two- and three-pole, three-position commercial trip
Type CH-HID: 15–30A. Single-, two- and three-pole	Selected amperages available in HACR switching duty
CH-HM high magnetic	Type CHP-HID: 15–30A. Single-, two- and three-pole
CH-M50 high ambient	Type CHP-GFCL: 15–30A. Single-pole ground fault breakers

**Enclosures**

NEMA® Type 1 indoor	NEMA Type 3R outdoor.
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**Loadcenter and Breaker Accessories**

Branch circuit breaker:	Complete line of ground bar kits 5, 10, 14 and 21 circuits, some with additional #2/0 lugs
Auxiliary components	Each terminal will accommodate: (3) #14–#10 Cu/Al or (1) #14–#4 Cu/Al
Hold-down kits	Sub-feed lugs 125, 150A—two- and three-pole
Handle ties	Shunt trips
Lockoffs	Universal rainproof conduit hubs Group One: 3/4, 1, 1-1/4, 1-1/2, 2 inches (19.1, 25.4, 31.8, 38.1, 50.8 mm)
Lockdogs	Group Two: 2, 2-1/2, 3 inches (50.8, 63.5, 76.2 mm)
	Adapter plate

**Bussing**

Silver flash plated copper bus is a standard feature

### Product Description

Loadcenters are enclosures specifically designed to house the branch circuit breakers and wiring required to distribute power to individual circuits. They contain either a main breaker when used at the service entrance point or a main lug when used as a sub-panel to add circuits to existing service. The main breaker protects the main entire panel and can be used as a service disconnect. The branch breakers protect the wires leading to individual electrical loads such as fixtures and outlets.

### Features, Benefits and Functions

#### **Loadcenter Construction**

Eaton's Type CH loadcenters feature silver flash plated copper bus in all interiors. Fingers are rated 200A throughout the CH line. Therefore, the sum of the handle ratings connected to any one stab is limited to 200A maximum. NEMA 1 boxes are manufactured from cold rolled 16 gauge sheet steel. Raintight boxes are manufactured from galvanized steel. All boxes and trims are finished using an electrostatic powder coat, baked urethane paint process.

#### **Neutrals**

Eaton's Type CH loadcenters feature three types of neutrals:

#### **Factory-Bonded Split Neutral**

Single-phase main circuit breaker panels are supplied with a factory-bonded twin neutral. When used as a sub-panel, the bonding strap should be removed, and the bonding screw should be reinstalled. The bonded side is now the ground, and the un-bonded side is the neutral. When used as a service entrance panel, the unused neutral holes on either side may be used for terminating ground wires.

#### **Insulated Split Neutral**

Most single-phase main lug panels (12 circuits and greater) are supplied with a twin neutral with an insulated cross strap. These panels are shipped in an un-bonded state. For service entrance applications, the neutral must be bonded utilizing the bonding strap supplied with the panel. For sub-feed applications, the panel may be installed as is. Separate ground bars are provided on these panels.

#### **Insulated/Bondable Single Neutral**

When a panel is supplied with a single neutral, it arrives from the factory in an "unbonded" state. All that is required to bond the neutral in a service entrance application is to loosen the bonding screw and the neutral screw directly beside it, insert the bonding strap into the neutral bar, and re-tighten both connections. The single neutral can be moved by the contractor to the other side of the panel, if desired. In a service entrance application, where the neutral is bonded, unused neutral connections may be used for the termination of equipment grounds.

#### **Inboard Plug-On Neutral**

Code changes and higher safety standards are leading to more arc fault circuit interrupter (AFCI) installations. With the electrical contractor in mind, Eaton has revolutionized the way Combination AFCIs are installed with the Plug-on Neutral line of loadcenters and breakers. This unique product solution enables the contractor to connect the breaker directly to the neutral bar, eliminating the need for wiring a pigtail.

#### **Grounds**

In service entrance applications where the neutral is bonded, unused neutral holes may be used for terminating ground conductors. In sub-feed panels, the neutral must be isolated (non-bonded), and ground wires must be terminated on a separate ground bar.

The Factory-Bonded Split Neutral panels have sufficient terminations for both ground and neutral conductors. The Insulated Split Neutral panels are supplied with a separate factory-installed ground bar. Insulated/Bondable Single Neutral panels are supplied without a ground bar (unless otherwise noted), and ground bar kits if needed must be purchased separately.

# 1.1

## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

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#### Type CH Loadcenter

Extra 1.5-Inch (38.1 mm) Knockout for Bundling  
Provides for easier installation, less installation time.

#### Top or Bottom Feed

- Straight-in wiring saves labor and material
- Only one panel for either application—no modifications necessary

#### Commercial Grade Main Breaker

- 35 kAIC series rated main breaker in 150 and 200A loadcenters
- 42 and 100 kAIC series ratings available

#### Drywall Marking on Enclosure

Indicates proper mounting depth for flush applications.

#### One-Piece Silver Flash Plated Copper Bus

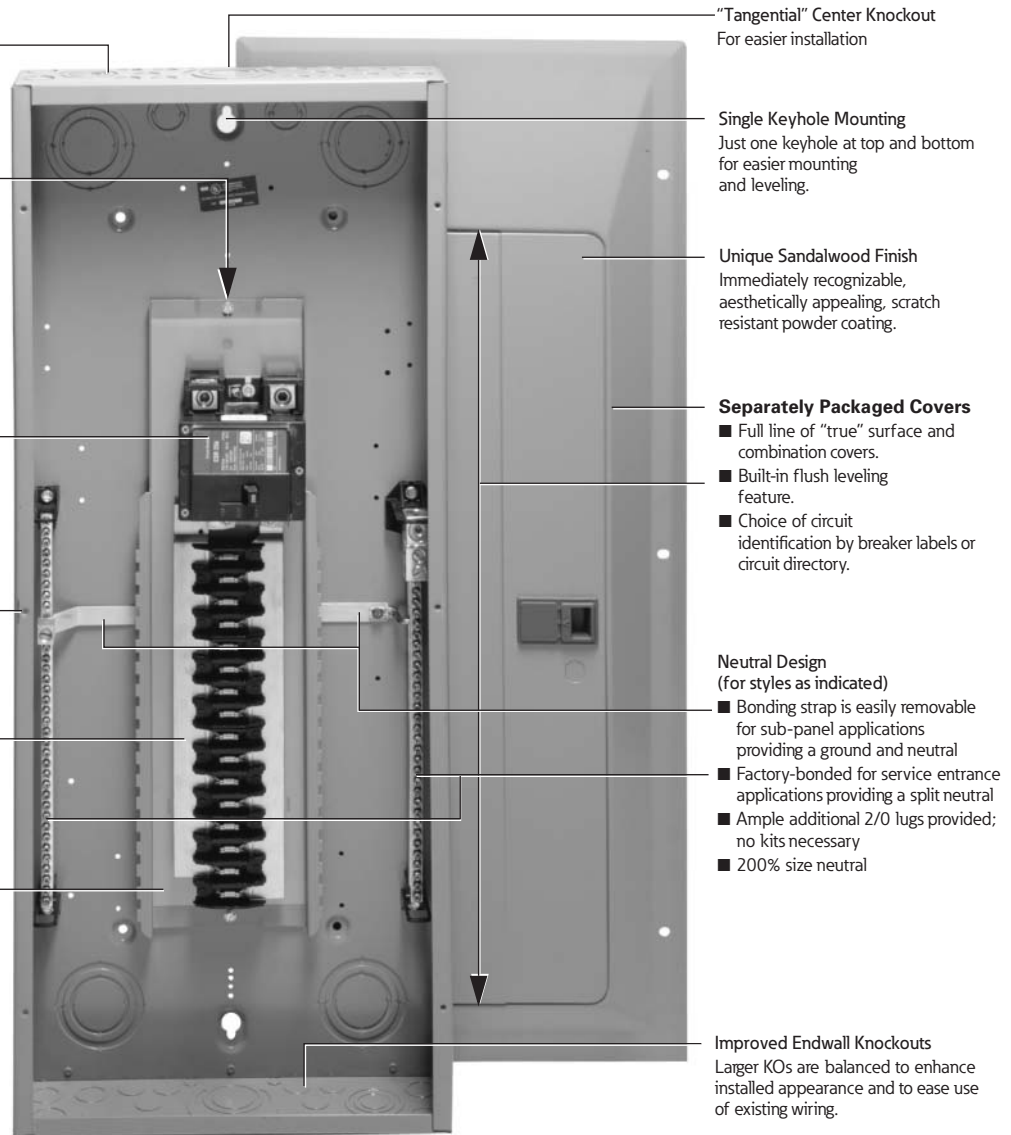
Provides superior conductivity throughout the entire product line.

#### Steel Backpan

- Provides positive, reliable breaker mounting
- One-piece designed for stability

#### Convertible Styles Available

- Uses field installable main breaker or main lug kits
- Flexible inventory—same breaker is used in loadcenter and circuit breaker enclosures



“Tangential” Center Knockout  
For easier installation

Single Keyhole Mounting  
Just one keyhole at top and bottom  
for easier mounting  
and leveling.

Unique Sandalwood Finish  
Immediately recognizable,  
aesthetically appealing, scratch  
resistant powder coating.

#### Separately Packaged Covers

- Full line of “true” surface and combination covers.
- Built-in flush leveling feature.
- Choice of circuit identification by breaker labels or circuit directory.

#### Neutral Design

(for styles as indicated)

- Bonding strap is easily removable for sub-panel applications providing a ground and neutral
- Factory-bonded for service entrance applications providing a split neutral
- Ample additional 2/0 lugs provided; no kits necessary
- 200% size neutral

#### Improved Endwall Knockouts

Larger KOs are balanced to enhance installed appearance and to ease use of existing wiring.

#### Warranty

The minimum warranty for residential loadcenters, breakers and surge protection devices shall be as follows:

- Lifetime loadcenter warranty
- Lifetime warranty on all arc fault circuit interrupting circuit breakers
- Lifetime warranty on CHSPULTRA including \$5000 connected load warranty
- Lifetime warranty on all thermal-magnetic and GFCI branch circuit breakers
- 1-year warranty on plug-in surge protection device (CHSURGE)

## Standards and Certifications

### UL® Listings

All Eaton Type CH loadcenters are listed under UL File E8741.

### Neutral and Ground Terminals

The standard terminals on grounds and neutrals are rated to accept (3)—#14—#10 Cu/Al or (1)—#14—4 wires. For larger cables, add-on neutral lugs may be ordered from the Accessories on **Page 25**.

**Note:** NEC® allows only one current carrying conductor per hole on neutrals unless otherwise noted.

### Bottom-Fed Loadcenters

When the power cable is brought into the loadcenter from below the panel; then the main lug panels, and single-phase, 225A and below, loadcenters can be rotated 180 degrees to allow straight-in wiring of power cables to the main terminals. Because the CSR main circuit breaker handle operates horizontally, the orientation of the main circuit breaker handle is consistent with the requirements of NEC Article 240-81.

### Gutter Splicing

Loadcenters are not UL listed as wiring troughs. Therefore, gutter splicing of riser cables to tap off to the main device is not permitted. Refer to NEC Article 373-8.

### Fire Rating

Due to the numerous openings in both loadcenter boxes and trims, they should not be mounted in firewalls. There is no approval method for sealing the enclosures for this application.

### Date Code

The date of manufacture of each loadcenter is printed on the outside of the carton as well as inside the loadcenter. On the carton, the date code is printed on the end carton label. In the loadcenter, the date code is located on the small white label located on the right side wall (with the main device on top).

The date code is in the following format: F # # # &. The "F" is the numeric code for the Lincoln, IL plant, and the three numbers are the year and week of manufacture e.g., 023. The "&" sign at the end signifies the decade of the 2000s. Therefore, the date code F023& would indicate that the product was manufactured in the 23rd week of 2000. The 1980s are represented by a "+" sign and the 1990s are represented by a "=" at the end of the code.

### Plug-On Type CH Breakers

Quick-make, quick-break switch mechanism combined with inverse time element tripping operation and trip-free handle design. Type CH circuit breakers trip to the OFF position eliminating nuisance callbacks. The thermal-magnetic trip curve avoids nuisance tripping on mild overloads while reacting almost instantaneously to severe short-circuit conditions. Multipole breakers have internal common trip connection to operate all poles simultaneously. Handles are marked with ON-OFF indication and ampere rating of the breaker. Type CH breakers meet UL Standard 489, NEMA standards, and Federal Spec Classification W-C 375 b/Gen. They are UL listed under File Number E11713, E8741, E3624 and E51287; and CSA® certified file number LR87196, except Type CHT breakers.

### Type CH Circuit Breaker Ratings

Single- and double-pole CH breakers rated 15 and 20A have low instantaneous magnetic trip levels. The 15 and 20A breakers with "HM" suffix have high magnetic trip settings recommended for circuits with inherently high inrush currents. All Type CH breakers are marked for heating, air conditioning and refrigeration (HACR) equipment application. Single-pole 15–20A breakers are also suitable for switching duty (SWD). Shunt trip coils operate on 120 Vac and require one additional pole space per breaker.



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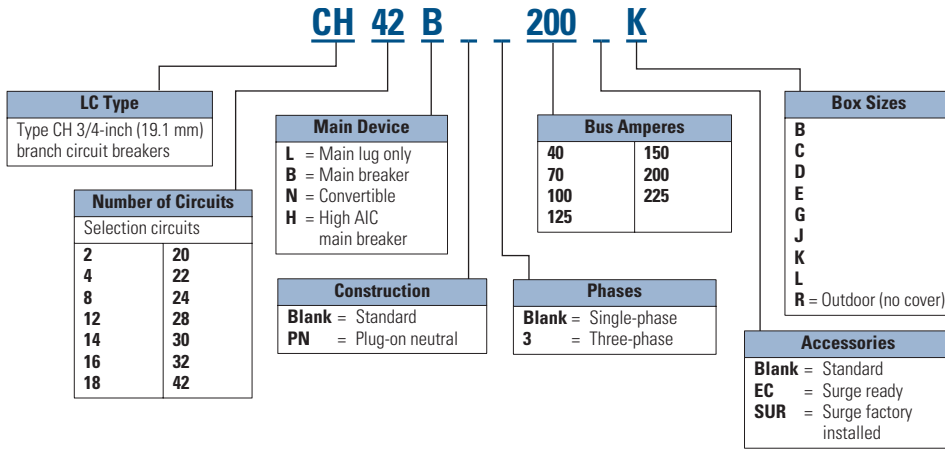
## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

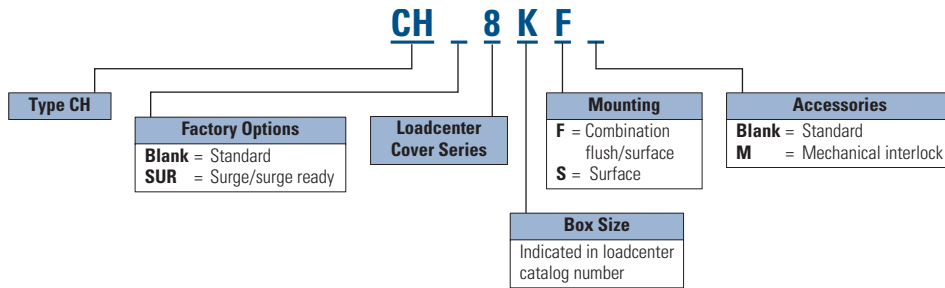
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#### Catalog Number Selection

#### Loadcenters 100–225A and 12–42 Circuits



#### Indoor Covers Ordered Separately

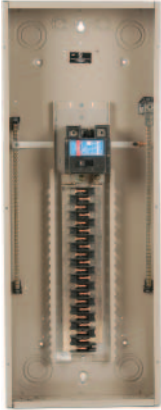


**Note:** All combinations are not valid, refer to the catalog section.

### Product Selection

#### Single-Phase—Main Circuit Breaker Loadcenters—10/35 kAIC

CH42B200K



#### Single-Phase Three-Wire—120/240 Vac—Factory-Bonded Split Neutral (Unless Otherwise Noted)

Main Breaker Type	Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) of Poles	Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Loadcenter <sup>①②</sup> Catalog Number	Loadcenter Cover Catalog Number Combination <sup>③</sup>	Surface		
CH 10 kAIC	100	14	Indoor	B	#6-1/0	CH14B100B <sup>④⑤</sup>	CH8BF	CH8BS		
		14	Outdoor	B	#6-1/0	CH14B100R <sup>⑥⑦</sup>	—	—		
		18	Indoor	C	#6-1/0	CH18B100C <sup>④⑤</sup>	CH8CF	CH8CS		
		18	Outdoor	C	#6-1/0	CH18B100R <sup>⑥⑦</sup>	—	—		
		22	Indoor	C	#6-1/0	CH22B100C <sup>④⑤</sup>	CH8CF	CH8CS		
		22	Outdoor	C	#6-1/0	CH22B100R <sup>⑥⑦</sup>	—	—		
		30	Indoor	D	#6-1/0	CH30B100D <sup>④⑤</sup>	CH8DF	CH8DS		
		30	Outdoor	D	#6-1/0	CH30B100R <sup>⑥⑦</sup>	—	—		
	125	22	Indoor	C	#6-1/0	CH22B125C <sup>④⑤</sup>	CH8CF	CH8CS		
		22	Outdoor	C	#6-1/0	CH22B125R <sup>⑥⑦</sup>	—	—		
		30	Indoor	D	#6-1/0	CH30B125D <sup>④⑤</sup>	CH8DF	CH8DS		
		30	Outdoor	D	#6-1/0	CH30B125R <sup>⑥⑦</sup>	—	—		
		CSH 35 kAIC <sup>⑧</sup>	150	8	Outdoor	E	#2-300 kcmil	CH8B150RF <sup>④⑤⑥⑨</sup>	—	—
				24	Indoor	E	#2-300 kcmil	CH24B150E <sup>④⑤</sup>	CH8EF	CH8ES
24	Outdoor			E	#2-300 kcmil	CH24B150R <sup>⑥⑦</sup>	—	—		
32	Indoor			J	#2-300 kcmil	CH32B150J <sup>④⑤</sup>	CH8JF	CH8JS		
32	Outdoor			J	#2-300 kcmil	CH32B150R <sup>⑥⑦</sup>	—	—		
200	8		Outdoor	E	#2-300 kcmil	CH8B200RF <sup>④⑤⑥⑨</sup>	—	—		
	24		Indoor	E	#2-300 kcmil	CH24B200E <sup>④⑤</sup>	CH8EF	CH8ES		
	24		Outdoor	E	#2-300 kcmil	CH24B200R <sup>⑥⑦</sup>	—	—		
	32		Indoor	J	#2-300 kcmil	CH32B200J <sup>④⑤</sup>	CH8JF	CH8JS		
	32		Outdoor	J	#2-300 kcmil	CH32B200R <sup>⑥⑦</sup>	—	—		
	42		Indoor	K	#2-300 kcmil	CH42B200K <sup>④⑤</sup>	CH8KF	CH8KS		
	42		Outdoor	K	#2-300 kcmil	CH42B200R <sup>⑥⑦</sup>	—	—		
	24		Indoor	E	#2-300 kcmil	CH24B200E <sup>④⑤</sup>	CH8EF	CH8ES		
	24		Outdoor	E	#2-300 kcmil	CH24B200R <sup>⑥⑦</sup>	—	—		
	32	Indoor	J	#2-300 kcmil	CH32B200J <sup>④⑤</sup>	CH8JF	CH8JS			
	32	Outdoor	J	#2-300 kcmil	CH32B200R <sup>⑥⑦</sup>	—	—			
	42	Indoor	K	#2-300 kcmil	CH42B200K <sup>④⑤</sup>	CH8KF	CH8KS			
	42	Outdoor	K	#2-300 kcmil	CH42B200R <sup>⑥⑦</sup>	—	—			
	225	32	Indoor	J	#2-300 kcmil	CH32B225J <sup>④⑤</sup>	CH8JF	CH8JS		
32		Outdoor	J	#2-300 kcmil	CH32B225R <sup>⑥⑦</sup>	—	—			
42		Indoor	K	#2-300 kcmil	CH42B225K <sup>④⑤</sup>	CH8KF	CH8KS			
42		Outdoor	K	#2-300 kcmil	CH42B225R <sup>⑥⑦</sup>	—	—			
DK 10 kAIC		300	42	Indoor	PM	(2) 3/0-250 kcmil	CH42PM300	CH7PMF <sup>⑩</sup>	CH7PMS	
		400	42	Indoor	PM	(2) 3/0-250 kcmil	CH42PM400	CH7PMF <sup>⑩</sup>	CH7PMS	

#### Notes

- ① All main circuit breaker loadcenters are listed for use as service entrance equipment.
- ② Ground bar kits priced separately. See **Page 26**.
- ③ Combination style covers may be used in surface or flush applications.
- ④ Loadcenters are factory-bonded for service entrance applications. Remove bonding strap for separate neutral and ground bars for sub-feed applications.
- ⑤ Can be top or bottom fed by rotating the enclosure and trim 180 degrees.
- ⑥ Loadcenter contains single insulated/bondable neutral.
- ⑦ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 26**.
- ⑧ 35 kAIC series combination rating is obtained when Types CH, CHT and CHP branch breakers are used with CSH main.
- ⑨ Panel includes #4-300 kcmil feed-through lugs.
- ⑩ This cover is for flush applications only (not combination).

Box sizes **Pages 41 and 42**.

# 1.1

## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

1

#### Single-Phase—High Interrupting Rated Main Circuit Breaker Loadcenters—42/100 kAIC

#### Single-Phase Three-Wire—120/240 Vac—Factory-Bonded Split Neutral (Unless Otherwise Noted)

Main Breaker Type	Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Poles	Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Loadcenter ① Catalog Number	Loadcenter Cover Catalog Number Combination ②	Surface
CHB4 42 kAIC ③	100	20	Indoor	C	#6–1/0	CH20H100C ④⑤	CH8CF	CH8CS
		20	Outdoor	C	#6–1/0	CH20H100R ⑥⑦	—	—
		28	Indoor	D	#6–1/0	CH28H100D ④⑤	CH8DF	CH8DS
		28	Outdoor	D	#6–1/0	CH28H100R ⑥⑦	—	—
CHH 100 kAIC ⑧	150	32	Indoor	L	#2/0–300 kcmil	CH32H150L ④	CH8LF	CH8LS
		32	Outdoor	L	#2/0–300 kcmil	CH32H150R ⑥⑦	—	—
	200	32	Indoor	L	#2/0–300 kcmil	CH32H200L ④	CH8LF	CH8LS
		32	Outdoor	L	#2/0–300 kcmil	CH32H200R ⑥⑦	—	—
		42	Indoor	L	#2/0–300 kcmil	CH42H200L ④	CH8LF	CH8LS
		42	Outdoor	L	#2/0–300 kcmil	CH42H200R ⑥⑦	—	—
	225	42	Indoor	L	#2/0–300 kcmil	CH42H225L ④	CH8LF	CH8LS
		42	Outdoor	L	#2/0–300 kcmil	CH42H225R ⑥⑦	—	—

#### Notes

- ① All main circuit breaker loadcenters are listed for use as service entrance equipment.
- ② Combination style covers may be used in surface or flush applications.
- ③ Series rated for 42 kAIC with all Types CH, CHT and CHP breakers.
- ④ Loadcenters are factory-bonded for service entrance applications. Remove bonding strap for separate neutral and ground bars for sub-feed applications.
- ⑤ Loadcenter can be top or bottom fed by rotating the enclosure and trim 180 degrees.
- ⑥ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 26**.
- ⑦ Loadcenter contains single insulated/bondable neutral.
- ⑧ Series rated for 100 kAIC with all Types CH, CHT and CHP breakers.



### Single-Phase—Main Lug Loadcenters

#### Single-Phase Three-Wire—120/240 Vac—Insulated/Bondable Neutral

Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Space	Poles	Enclosure Type	Type of Trim (Included)	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Loadcenter Catalog Number	
								Surface
40	2	4 ①	Indoor	Surface (no door)	5	#14–6	<b>CH2L40SP</b> ②③	
			Outdoor	—	5R	#14–6	<b>CH2L40RP</b> ②③④	
			Indoor	Flush (no door)	5	#14–6	<b>CH2L40FP</b> ②③	
70	2	4 ①	Indoor	Surface (no door)	5	#14–2	<b>CH2L70SP</b> ②③	
			Outdoor	—	5R	#14–2	<b>CH2L70RP</b> ②③④	
			Indoor	Flush (no door)	5	#14–2	<b>CH2L70FP</b> ②③	
125	2	4 ①	Indoor	Surface (no door)	6	#14–1/0	<b>CH2L125SP</b> ②③	
			Outdoor	—	6R	#14–1/0	<b>CH2L125RP</b> ②③④	
	2	2	2	Outdoor	—	—	#14–1/0	<b>CH2L125RSE2P</b> ④⑤⑥
				Indoor	Flush (no door)	6	#14–1/0	<b>CH2L125FP</b> ②③
	4	8 ①	4	Indoor	Surface (no door)	7	#14–1/0	<b>CH4L125SP</b> ②⑦
				Outdoor	—	7R	#14–1/0	<b>CH4L125RP</b> ②④⑦
	4	8 ①	4	Indoor	Flush (no door)	7	#14–1/0	<b>CH4L125FP</b> ②⑦
				Indoor	Surface (no door)	7	#6–1/0	<b>CH8L125SP</b> ②⑧
	8	16 ①	8	Outdoor	—	7R	#6–1/0	<b>CH8L125RP</b> ②⑥⑦
				Indoor	Flush (no door)	7	#6–1/0	<b>CH8L125FP</b> ②⑥

#### Notes

- ① Requires the use of Type CHNT breakers.
- ② Ground bar kits priced separately, see **Page 26**.
  - For 2/4 circuit loadcenters use Type GBK5 or GBK520 ground bar
  - For 4/8 and 8/16 circuit loadcenters use Type GBK10 ground bar
  - Ground bars mount to the left side wall of the enclosure for the 4/8 and 8/16 circuit loadcenters
- ③ Suitable for use as service equipment when not more than two service disconnecting mains are provided or when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ④ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 26**.
- ⑤ For use as service entrance applications only.
- ⑥ Neutral/ground holes (6) #14–6 and (3) #14–2/0 AWG Cu/Al.
- ⑦ Suitable for use as service equipment when not more than two service disconnecting mains are provided or when not more than six service disconnecting mains are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ⑧ Suitable for use as service equipment when a main breaker is used or when not more than six service disconnecting mains are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).

Box sizes **Pages 41 and 42**.

# 1.1

## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

1

CH42L225G



#### Single-Phase Three-Wire—120/240 Vac—Twin Neutral—Factory-Installed Ground Bar

Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Poles	Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Loadcenter Catalog Number	Loadcenter Cover Catalog Number	
						Combination	Surface
125	12	Indoor	B	#6–2/0	CH12L125B ①	CH8BF	CH8BS
	12	Outdoor	B	#6–2/0	CH12L125R ①②	—	—
	16	Indoor	B	#6–2/0	CH16L125B ①	CH8BF	CH8BS
	16	Outdoor	B	#6–2/0	CH16L125R ①②	—	—
	20	Indoor	C	#6–2/0	CH20L125C ①	CH8CF	CH8CS
	20	Outdoor	C	#6–2/0	CH20L125R ①②	—	—
	24	Indoor	C	#6–2/0	CH24L125C ①	CH8CF	CH8CS
	24	Outdoor	C	#6–2/0	CH24L125R ①②	—	—
150	24	Indoor	D	#4–300 kcmil	CH24L150D ①	CH8DF	CH8DS
	24	Outdoor	D	#4–300 kcmil	CH24L150R ②③	—	—
	32	Indoor	D	#4–300 kcmil	CH32L150D ①	CH8DF	CH8DS
	32	Outdoor	D	#4–300 kcmil	CH32L150R ②③	—	—
200	12	Indoor	D	#4–300 kcmil	CH12L200D ①	CH8DF	CH8DS
	12	Outdoor	D	#4–300 kcmil	CH12L200R ②③	—	—
	16	Indoor	D	#4–300 kcmil	CH16L200D ①	CH8DF	CH8DS
	16	Outdoor	D	#4–300 kcmil	CH16L200R ②③	—	—
225	24	Indoor	D	#4–300 kcmil	CH24L225D ①	CH8DF	CH8DS
	24	Outdoor	D	#4–300 kcmil	CH24L225R ②③	—	—
	32	Indoor	D	#4–300 kcmil	CH32L225D ①	CH8DF	CH8DS
	32	Outdoor	D	#4–300 kcmil	CH32L225R ②③	—	—
	42	Indoor	G	#4–300 kcmil	CH42L225G ③	CH8GF	CH8GS
	42	Outdoor	G	#4–300 kcmil	CH42L225R ②③	—	—
400	42	Indoor	P	(2) 1/0–300 kcmil (1) 750 kcmil	CH42PL400 ④	CH7PF ⑤	CH7PS

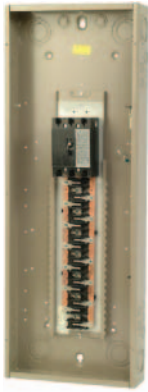
#### Notes

- ① Suitable for use as service equipment when not more than six disconnecting means are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ② Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 26**.
- ③ Suitable for use as service equipment when a circuit breaker is used as a main breaker. The main breaker is backfed and requires hold-down bracket kit catalog number **CH125RB**.
- ④ Suitable for use as service equipment when a circuit breaker is used as a main breaker. The main breaker is backfed and must be a Type CHB.  
**The breaker cannot be a Type CH.**
- ⑤ This cover is for flush application only (not combination).

Box sizes **Pages 41** and **42**.

### Three-Phase—Main Circuit Breaker Loadcenters—10 kAIC

CH42B3200L



#### Three-Phase Four-Wire—208Y/120 Vac or 240 Vac Insulated/Bondable Neutral

Main Breaker Type	Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Poles	Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Loadcenter Catalog Number <sup>①②</sup>	Loadcenter Cover Catalog Number	Combination	Surface
CC 10 kAIC	150	30	Indoor	L	#1–4/0	CH30B3150L	CH8LF	CH8LS	
		30	Outdoor	L	#1–4/0	CH30B3150R <sup>③</sup>	—	—	
	200	30	Indoor	L	#2/0–300 kcmil	CH30B3200L	CH8LF	CH8LS	
		30	Outdoor	L	#2/0–300 kcmil	CH30B3200R <sup>③</sup>	—	—	
		42	Indoor	L	#2/0–300 kcmil	CH42B3200L	CH8LF	CH8LS	
		42	Outdoor	L	#2/0–300 kcmil	CH42B3200R <sup>③</sup>	—	—	
	225	30	Indoor	L	#2/0–300 kcmil	CH30B3225L	CH8LF	CH8LS	
		30	Outdoor	L	#2/0–300 kcmil	CH30B3225R <sup>③</sup>	—	—	
		42	Indoor	L	#2/0–300 kcmil	CH42B3225L	CH8LF	CH8LS	
		42	Outdoor	L	#2/0–300 kcmil	CH42B3225R <sup>③</sup>	—	—	
	400	42	Indoor	PM	(2) 3/0–350 kcmil	CH424PM400	CH7PMF <sup>④</sup>	CH7PMS	

### Three-Phase—Main Lug Loadcenters

#### Three-Phase Four-Wire—208Y/120 Vac or 240 Vac Insulated/Bondable Neutral

Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Spaces	Poles	Enclosure Type	Type of Trim Included	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Loadcenter Catalog Number
125	6	12 <sup>⑤</sup>	Indoor	Surface no door	7	#14–1/0	CH6L3125SP <sup>⑥⑦</sup>
	6	12 <sup>⑤</sup>	Outdoor	—	7R	#14–1/0	CH6L3125RP <sup>⑥⑦③</sup>
	6	12 <sup>⑤</sup>	Indoor	Flush no door	7	#14–1/0	CH6L3125FP <sup>⑥⑦</sup>

#### Notes

- ① All main circuit breaker loadcenters are listed for use as service entrance equipment.
- ② For ground bar kits, see **Page 26**.
- ③ Rainproof loadcenters are furnished with hub closure plates. For rainproof hubs, refer to **Page 26**.
- ④ This cover for flush application only (not combination).
- ⑤ Requires the use of CHNT breakers.
- ⑥ Suitable for use as service equipment when not more than two service disconnecting means are provided or when not more than six service disconnecting means are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ⑦ Ground bar kits priced separately, see **Page 26**.
  - Use GBK10 ground bar
  - Ground bars mount to the left side wall of the enclosure.

Box sizes **Pages 41 and 42**.

# 1.1

## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

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#### Three-Phase Four-Wire—208Y/120 Vac or 240 Vac—Insulated/Bondable Neutral

Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) Poles	Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Loadcenter Catalog Number	Loadcenter Cover Catalog Number Combination	Surface
125	12	Indoor	B	#6–2/0	CH12L3125B ①②	CH8BF	CH8BS
	12	Outdoor	B	#6–2/0	CH12L3125R ①②③	—	—
	18	Indoor	C	#6–2/0	CH18L3125C ①②	CH8CF	CH8CS
	18	Outdoor	C	#6–2/0	CH18L3125R ①②⑤	—	—
	24	Indoor	C	#6–2/0	CH24L3125C ①②	CH8CF	CH8CS
	24	Outdoor	C	#6–2/0	CH24L3125R ①②⑤	—	—
150	30	Indoor	D	#4–300 kcmil	CH30L3150D ①②	CH8DF	CH8DS
	30	Outdoor	D	#4–300 kcmil	CH30L3150R ①③④	—	—
225	24	Indoor	D	#4–300 kcmil	CH24L3225D ①②	CH8DF	CH8DS
	24	Outdoor	D	#4–300 kcmil	CH24L3225R ①③④	—	—
	30	Indoor	D	#4–300 kcmil	CH30L3225D ①②	CH8DF	CH8DS
	30	Outdoor	D	#4–300 kcmil	CH30L3225R ①③④	—	—
	42	Indoor	G	#4–300 kcmil	CH42L3225G ④⑤	CH8GF	CH8GS
	42	Outdoor	G	#4–300 kcmil	CH42L3225R ③④⑤	—	—
400	42	Indoor	P	(2) 1/0–300 kcmil (1) 750 kcmil	CH424PL400 ⑥⑦	CH7PF ⑥	CH7PS

#### Three-Phase—High Interrupting Rated Main Circuit Breaker Loadcenters—100 kAIC

#### Three-Phase Four-Wire—208Y/120 Vac or 240 Vac Insulated/Bondable Neutral

Main Breaker Type	Main Ampere Rating	Maximum Number 3/4-Inch (19.1 mm) of Poles	Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Loadcenter Catalog Number ⑧⑨	Loadcenter Cover Catalog Number Combination	Surface
CHH 100 kAIC ⑩	200	30	Indoor	L	#2/0–300 kcmil	CH30H3200L	CH8LF	CH8LS
		30	Outdoor	L	#2/0–300 kcmil	CH30H3200R ⑪	—	—
		42	Indoor	L	#2/0–300 kcmil	CH42H3200L	CH8LF	CH8LS
		42	Outdoor	L	#2/0–300 kcmil	CH42H3200R ⑪	—	—
	225	42	Indoor	L	#2/0–300 kcmil	CH42H3225L	CH8LF	CH8LS
		42	Outdoor	L	#2/0–300 kcmil	CH42H3225R ⑪	—	—

#### Notes

- ① Ground bar Type GBK14 is installed.
- ② Suitable for use as service equipment when a circuit breaker is used as a main breaker. The main breaker is backfed and requires hold-down bracket kit catalog number Type **CH125RB**. Suitable for use as service equipment when not more than six service disconnecting means are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ③ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 26**.
- ④ Suitable for use as service equipment when a circuit breaker is used as a main breaker. The main breaker is backfed and requires hold-down kit catalog number Type **CH125RB**.
- ⑤ Ground bar Type GBK21 is installed.
- ⑥ Suitable for use as service equipment when a circuit breaker is used as a main breaker. The main breaker is backfed and must be a Type CHB. **The breaker cannot be a Type CH.**
- ⑦ For ground bar kits, see **Page 26**.
- ⑧ This cover is for flush application only (not combination).
- ⑨ All main circuit breaker loadcenters are listed for use as service entrance equipment.
- ⑩ Ground bar kits priced separately.
- ⑪ 100 kAIC series combination rating is obtained when Types CH and CHP branch breakers are used with CHH main.
- ⑫ Rainproof loadcenters are furnished with hub closure plates.

### Convertible Loadcenters MCB or MLO—Base Units and Main Devices—10/35 kAIC

Complete assembly consists of: loadcenter, cover, and either main breaker kit or main lug kit.

#### Indoor—Single-Phase—Three-Wire—120/240V—Factory-Bonded Split Neutral—Top or Bottom Feed

Maximum Main Ampere Rating	Maximum Number of Single Poles	Box Size	Loadcenter Box and Panel Catalog Number <sup>①②</sup>	Loadcenter Cover Catalog Number		Main Lug Kit		Main Breaker Kit		Catalog Number
				Combination	Surface	Wire Size	Catalog Number	kAIC Rating	Wire Size	
125	22	C	CH22N125C	CH8CF	CH8CS	#10–1/0	CHL125N	10	#10–1/0	CH2100N <sup>③</sup>
										CH2125N <sup>③</sup>
200	32	J	CH32N200J	CH8JF	CH8JS	#4–300 kcmil	CHL225N	25	#2–300 kcmil	CSH2125N <sup>④⑤</sup>
										CSH2150N <sup>④⑤</sup>
										CSH2175N <sup>④⑤</sup>
										CSH2200N <sup>④⑤</sup>
225	42	K	CH42N225K	CH8KF	CH8KS	#4–300 kcmil	CHL225N	25	#2–300 kcmil	CSH2125N <sup>④⑤</sup>
										CSH2150N <sup>④⑤</sup>
										CSH2175N <sup>④⑤</sup>
										CSH2200N <sup>④⑤</sup>
										CSH2225N <sup>④⑤</sup>

#### Outdoor—Single-Phase—Three-Wire—120/240V—Insulated/Bondable Neutral

Maximum Main Ampere Rating	Maximum Number of Single Poles	Box Size	Loadcenter Box and Panel Catalog Number <sup>①</sup>	Main Lug Kit		Main Breaker Kit		Catalog Number
				Wire Size	Catalog Number	kAIC Rating	Wire Size	
200	8	E	CH8N200RF <sup>⑥⑦</sup>	#4–300 kcmil	CHL225N	25	#2–300 kcmil	CSH2125N
								CSH2150N
								CSH2175N
								CSH2200N
125	22	C	CH22N125R <sup>⑥</sup>	#10–1/0	CHL125N	10	#10–1/0	CH2100N <sup>③</sup>
								CH2125N <sup>③</sup>
200	32	J	CH32N200R <sup>⑥</sup>	#4–300 kcmil	CHL225N	25	#2–300 kcmil	CSH2125N <sup>④⑤</sup>
								CSH2150N <sup>④⑤</sup>
								CSH2175N <sup>④⑤</sup>
								CSH2200N <sup>④⑤</sup>
225	42	K	CH42N225R <sup>⑥</sup>	#4–300 kcmil	CHL225N	25	#2–300 kcmil	CSH2125N <sup>④⑤</sup>
								CSH2150N <sup>④⑤</sup>
								CSH2175N <sup>④⑤</sup>
								CSH2200N <sup>④⑤</sup>
								CSH2225N <sup>④⑤</sup>

#### Notes

- ① Panel does not include main. Order main breaker or main lug kit separately.
- ② Loadcenters are factory-bonded for service entrance applications. Remove bonding strap for separate neutral and ground bars for sub-feed applications.
- ③ Hold-down kit included.
- ④ 35 kAIC series combination rating is obtained when Types CH, CHT and CHP branch breakers are used with CSR main.
- ⑤ CSH breakers include line lugs only as standard.
- ⑥ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 26**.
- ⑦ Includes feed-through lugs for both phase and neutral conductors.

Interrupting rating depends on main circuit breaker selected.

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## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

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#### Spa Panels



#### Quick-Pro<sup>SM</sup>

All you need to know to save time and make more money. Specified on certain Eaton products, the Quick-Pro symbol allows for immediate recognition of products that are designed for straightforward installation. When you see Quick-Pro, you know you can install quickly—sometimes up to 50% less than the usual installation time—and move onto your next job.

CH Spa Panel



#### Single-Phase Three-Wire—120/240 Vac Insulated/Bondable Neutral—Factory-Installed Ground Bar

Main Ampere Rating	Circuit Breaker Included	Enclosure Type	Type of Trim Included	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Catalog Number
30	CH230GF	Outdoor	—	5R	#14–1/0	<b>CH30SPA</b> ①
40	CH240GF	Outdoor	—	5R	#14–1/0	<b>CH40SPA</b> ②
50	CH250GF	Outdoor	—	5R	#14–1/0	<b>CH50SPA</b> ③
60	CH260GF	Outdoor	—	5R	#14–1/0	<b>CH60SPA</b> ④

#### Notes

- ① Includes a CH230GFI breaker, factory installed, and two extra circuits for convenience.
- ② Includes a CH240GFI breaker, factory installed, and two extra circuits for convenience.
- ③ Includes a CH250GFI breaker, factory installed, and two extra circuits for convenience.
- ④ Includes a CH260GFI breaker, factory installed, and two extra circuits for convenience.

### Single-Phase and Three-Phase Circuit Breaker Unit Enclosures—10/35 kAIC

#### Circuit Breaker Unit Enclosures



#### Type ECB Circuit Breaker Unit Enclosure—Order Type CSR Circuit Breaker Separately—Unit Enclosure Includes Lug Tree Kit

Main Ampere Rating	Unit Enclosure Type	Mounting	Type of Circuit Breaker	Wire Size Range Cu/Al 60°C or 75°C	Catalog Number
<b>Single-Phase Three-Wire—240 Vac Maximum</b>					
150	Outdoor	—	CSR (included) ①	④	<b>ECB150RB</b> ⑤⑥⑦
200	Outdoor	—	CSR (included) ②	④	<b>ECB200RB</b> ⑤⑥⑦
225	Indoor	Flush	CSR ③	④	<b>ECB225F</b> ③⑥⑦
	Indoor	Surface	CSR ③	④	<b>ECB225S</b> ③⑥⑦
	Outdoor	—	CSR ③	④	<b>ECB225R</b> ③⑥⑦

#### CSH2200N



#### Type CSH Circuit Breakers 120/240 Vac—35 kAIC For Use in Type ECB Unit Enclosures

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C for Line Terminals	Two-Pole Breakers 35 kAIC Catalog Number
100	#2–300 kcmil	<b>CSH2100N</b>
125	#2–300 kcmil	<b>CSH2125N</b>
150	#2–300 kcmil	<b>CSH2150N</b>
175	#2–300 kcmil	<b>CSH2175N</b>
200	#2–300 kcmil	<b>CSH2200N</b>
225	#2–300 kcmil	<b>CSH2225N</b>

#### Wire Data

Wire/Application	Maximum Wire Size	Maximum Ampere Rating
Aluminum—standard	250 kcmil	200
Aluminum—service entrance	250 kcmil	225
Copper—standard and service entrance	250 kcmil	225

#### Notes

- ① CSR2150N factory-installed circuit breaker.
- ② CSR2200N factory-installed circuit breaker.
- ③ Order circuit breaker separately.
- ④ Wire size is determined by the circuit breaker installed in enclosure. Maximum wire size and ampere rating is determined by Wire Data table above.
- ⑤ Rainproof panels are furnished with hub closures plates. For rainproof hubs, refer to **Page 26**.
- ⑥ One ground lug accepting (1) #14 –#2 is factory installed. Also, there are pre-drilled holes to accept a GBK5 ground bar.
- ⑦ Approved for service entrance.
- ⑧ Add suffix indicated to end of breaker catalog number.

Box sizes **Pages 41** and **42**.

#### Shunt Trips

Type	Volts	Catalog Number Suffix Adder ⑧
CSH	12	<b>SR12</b>
CSH	24	<b>SR24</b>
CSH	120	<b>SR01</b>

#### CSR Lug Tree Kit For Replacement Purposes Only For Use in Type ECB Unit Enclosures

Ampere Rating	Description	Wire Size Range Cu/Al 60°C or 75°C for Line Terminals	Catalog Number
225	For use on 125, 150, 175, 200 and 225A CSR breakers	#2–300 kcmil	<b>MCBK225</b>

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## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

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#### Type ECC Circuit Breaker Unit Enclosure—Order Type CC Circuit Breaker Separately

Main Ampere Rating	Unit Enclosure Type	Mounting	Circuit Breaker Type	Wire Size Range Cu/Al 60°C or 75°C	Catalog Number
<b>Single-Phase Three-Wire—240 Vac Maximum</b>					
225	Indoor	Flush	CC ①	②	<b>ECC225F</b> ①③④
225	Indoor	Surface	CC ①	②	<b>ECC225S</b> ①③④
225	Outdoor	—	CC ①	②	<b>ECC225R</b> ①③④⑤

#### Type CC Circuit Breakers 240 Vac—10 kAIC For Use in Type ECC Unit Enclosures

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C for Line Terminals	Type CC 10 kAIC Catalog Number
<b>Two-Pole</b>		
100	#4–4/0	<b>CC2100</b>
125	#4–4/0	<b>CC2125</b>
150	#4–4/0	<b>CC2150</b>
175	#2/0–300 kcmil	<b>CC2175</b>
225	#2/0–300 kcmil	<b>CC2200</b>
225	#2/0–300 kcmil	<b>CC2225</b>
<b>Three-Pole</b>		
100	#4–4/0	<b>CC3100</b>
125	#4–4/0	<b>CC3125</b>
150	#4–4/0	<b>CC3150</b>
175	#2/0–300 kcmil	<b>CC3175</b>
200	#2/0–300 kcmil	<b>CC3200</b>
225	#2/0–300 kcmil	<b>CC3225</b>

#### Wire Data

Wire/Application	Maximum Wire Size	Maximum Ampere Rating
Aluminum—standard	250 kcmil	200
Aluminum—service entrance	250 kcmil	225
Copper—standard and service entrance	250 kcmil	225

#### Notes

- ① Order circuit breaker separately.
- ② Wire size is determined by the circuit breaker installed in enclosure. Maximum wire size and ampere rating is determined by the Wire Data table above.
- ③ One ground lug accepting (1) #14–#2 is factory installed. Also, there are pre-drilled holes to accept a GBK5 ground bar.
- ④ Approved for service entrance.
- ⑤ Rainproof panels are furnished with hub closures plates. For rainproof hubs, refer to **Page 26**.

Box sizes **Pages 41 and 42**.

#### Shunt Trips, Auxiliary and Alarm Contacts

Type	Volts	Catalog Number Suffix Adder
<b>Shunt Trip</b>		
CC	12 DC	<b>SR12</b>
CC	24 DC	<b>SR24</b>
CC	120 AC	<b>SR01</b>
CC	208 AC	<b>SR08</b>
CC	240 AC	<b>SR02</b>
<b>Auxiliary Contact</b>		
CC (1) NO and (1) NC	—	<b>AL1</b>
<b>Alarm Contact</b>		
CSR	—	<b>CR1</b>



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

- A. The Contractor shall furnish and install 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 and NEMA including:
  1. UL 67—standards for panelboards
  2. UL 50—standards for cabinets and boxes
  3. UL 489—standards for molded case circuit breakers
  4. Federal Spec Classification W-C 375
  5. UL 1699 — all fault interrupting

**Qualifications**

- A. The manufacturer of the loadcenter shall be the manufacturer of the circuit breaker within the load center. All breakers shall be full size.
- 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 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. Breakers shall be full size and a minimum of 125A frame. Breakers 10 –125A trip size shall take up the same pole spacing.
- C. Loadcenters shall be labeled with a UL short-circuit rating. When series ratings are applied with integral or remote devices, a label shall be provided. Series 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 so designed that circuit breakers can be replaced without disturbing adjacent units and without removing the main bus connectors and shall be so designed that circuits may be changed without machining, drilling or tapping.
- C. Physical means must be provided to prevent the installation of more overcurrent devices than that number for which the enclosure was designed. Full size breakers are required.

**Bus**

- A. Bus bars for the main and cross connectors shall be of silver flash plated copper construction in accordance with UL standards. Bussing shall be braced to 65 kAIC.
- B. Neutral bussing 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 suitable for copper or aluminum wire of the sizes indicated. All connectors shall meet the "Requirements for Wire Connectors and Soldering Lugs" UL 486B.
- B. All loadcenters where marked shall be suitable for use with 60/75°C rated wire.

**Circuit Breakers**

- A. Circuit breakers shall be molded case type, 3/4-inch (19.1 mm) wide per pole. Multipole circuit breakers shall be of a stack pole design to provide electrical phase isolation and have an internal common trip.
- B. Each pole of the circuit breaker will have inverse time delay overload and instantaneous short-circuit protection by means of both thermal and magnetic sensors. Circuit breakers shall be quick-make/quick-break.
- C. The circuit breaker calibration shall not be affected by environmental changes in relative humidity. Breakers shall be calibrated after assembly.

- 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 good visual trip indication.
- E. Contacts shall be of non-welding silver alloy.
- F. All branch breaker handles shall be of a different color than the case of the breaker.
- G. All terminals shall be listed for use with copper or aluminum conductors. Terminals shall be of the box lug design. The terminals shall meet UL 486B requirements and shall be suitable for use with either 60° or 75°C wire.
- H. Breakers shall be SWD rated and/or HACR rated as required.
- I. Arc fault interrupting circuit breakers, (AFC), shall be provided on all 15 and 20A single-phase 120/240 Vac circuits except those indicated as remote controlled breakers. AFI breakers shall be "Classified for mitigating the effects of arcing faults," or conforming to UL Standard 1699 and as defined by per article 210-12 Section A of the 1999 NEC Code.

# 1.1

## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

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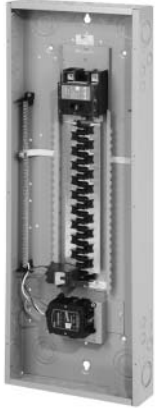
#### Enclosures

- A. Loadcenters shall have NEMA 1 general purpose or NEMA 3R rainproof enclosures as indicated on the drawings and shall be surface or flush mounted except where noted.
- B. For indoor applications, enclosures shall be rated NEMA 1. Enclosures shall be manufactured from cold-rolled code-gauge sheet steel having multiple knockouts and painted per paint specification. For outdoor applications, enclosures shall be rated NEMA 3R. Enclosures shall be manufactured from galvanized steel which shall be painted per the painted as specified. Enclosures shall be of sufficient size to meet or exceed NEC wire bending space.
- C. The cover shall have an easy adjustment feature for flush applications.
- D. Boxes shall be factory assembled into a single rigid structure.
- E. Provide circuit breaker marking labels and directories.

#### Finish

- A. Boxes and trims shall be finished with a high scratch-resistant aesthetically pleasing finish. The finish shall be polyurethane coating electrostatically applied to a thickness of 1.8 to 2 mils.
- B. All loadcenters shall be provided with provisions for accepting a paintable or wall paperable decorator accessory cover. Where loadcenters are installed in living areas, provide manufacturer designed and tested decorator cover kits.

### Surge Panel



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## Surge Panel

### Product Description

Eaton's Type CH Surge Loadcenter includes a factory-mounted and wired surge suppressor device. There is a knockout in the cover that allows the user to view the status indication lights on the surge suppressor. The CH Surge Loadcenter reduces the surge current, helping protect sensitive home electronic equipment.



Save labor by installing a factory-mounted surge protective device.

### Factory-Installed Surge Protection

- Includes a CHSPULTRA and a two-pole 15A circuit breaker
- Increases the effectiveness of surge protection due to reduced lead length
- A modified deadfront allows for easy viewing of indicating lights

### Surge Ready

- Provides a mounting provision for CHSPULTRA
- A modified deadfront allows for easy viewing of indicating lights

### Product Selection

#### Surge Installed Loadcenters

Ampere Rating	Type	Number of Circuits	Loadcenter Catalog Number	Loadcenter Cover Catalog Number Combination	Surface
225	Convertible	42	CHSUR42N225L ①	CHSUR8LF	CHSUR8LS
225	Convertible ②	42	CHSUR42L225L2 ①	CHSUR8LF	CHSUR8LS
200	Main breaker	42	CHSUR42B200L2 ①	CHSUR8LF	CHSUR8LS
225	Convertible	32	CHSUR32N225K ①	CHSUR8KF	CHSUR8KS
225	Convertible ②	32	CHSUR32L225K ①	CHSUR8KF	CHSUR8KS
200	Main breaker	32	CHSUR32B200K ①	CHSUR8KF	CHSUR8KS
150	Main breaker	32	CHSUR32B150K ①	CHSUR8KF	CHSUR8KS
100	Main breaker	32	CHSUR32B100K ①	CHSUR8KF	CHSUR8KS
125	Convertible ②	24	CHSUR24L125E ①	CHSUR8EF	CHSUR8ES
100	Main breaker	24	CHSUR24B100E ①	CHSUR8KF	CHSUR8KS
200	Convertible	40/40	BRSUR4040N200	Cover included	
200	Main lug	40/40	BRSUR4040L200	Cover included	
200	Main breaker	40/40	BRSUR4040B200	Cover included	
200	Convertible	30/40	BRSUR3040N200	Cover included	
200	Main lug	30/40	BRSUR3040L200	Cover included	
200	Main breaker	30/40	BRSUR3040B200	Cover included	

#### Notes

- ① Order cover separately.
- ② With main lugs installed.

# 1.1

## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

1

#### Surge Ready Loadcenters (provision only, CHSPULTRA and breaker not included)

Ampere Rating	Type	Number of Circuits	Loadcenter Catalog Number <sup>①</sup>	Loadcenter Cover Catalog Number Combination	Surface
225	Convertible	42	CHEC42N225L	CHSUR8LF	CHSUR8LS
225	Convertible <sup>②</sup>	42	CHEC42L225L	CHSUR8LF	CHSUR8LS
200	Main breaker	42	CHEC42B200L	CHSUR8LF	CHSUR8LS
225	Convertible <sup>②</sup>	32	CHEC32L225K	CHSUR8KF	CHSUR8LS
225	Convertible	32	CHEC32N225K	CHSUR8KF	CHSUR8LS
200	Main breaker	32	CHEC32B200K	CHSUR8KF	CHSUR8LS
150	Main breaker	32	CHEC32B150K	CHSUR8KF	CHSUR8LS
100	Main breaker	32	CHEC32B100K	CHSUR8KF	CHSUR8LS
125	Convertible <sup>②</sup>	24	CHEC24L125E	CHSUR8EF	CHSUR8LS
100	Main breaker	24	CHEC24B100E	CHSUR8EF	CHSUR8LS

#### Main Breaker Kits

Maximum Main Ampere Rating	Catalog Number
100	CSH2100N
150	CSH2150N
200	CSH2200N
225	CSH2225N

#### Main Lug Kits

Maximum Main Ampere Rating	Catalog Number
125	CHL125N
225	CHL225N

### Technical Data and Specifications

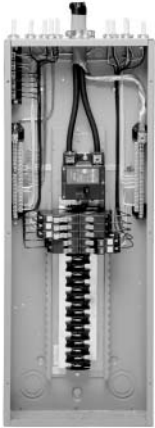
#### Ratings

- Loadcenter
  - 35 kAIC main breaker, main lug only, and convertible main breaker/main lug
  - Factory installed or provision for field-installed surge suppressor
  - Top or bottom feed
- Surge suppressor (CHSPULTRA)
  - Total joules: 3500 joules
  - Maximum surge current: 175,000A
  - Per phase (L-N/L-G) surge current: 75,000A
  - Warranty: lifetime
  - Connected equipment warranty: \$75,000

#### Notes

- ① Order cover separately.
- ② With main lugs installed.

Renovation Panel



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## Type CH Renovation Loadcenter

### Product Description

Eaton's Renovation Loadcenter is designed for the service contractor. With the addition of a five-circuit terminal block factory mounted in the top left corner of the loadcenter, the service contractor can terminate short-circuit wires instead of having to use expensive wire nuts. Also, the Renovation Loadcenter incorporates a twin-stacked neutral design that places the neutral and ground terminations higher in the loadcenter. Both of these features were added without increasing any size from a standard loadcenter. These features will eliminate the need for wire nuts and make for a much neater installation. There is a provision to field mount a second five-circuit terminal block (RN5TB) in the top right corner of the loadcenter. Choose amongst Eaton's Type CH breaker family for use in the Renovation Panel.

### Product Selection

#### Single-Phase—Main Circuit Breaker Loadcenters 35 kAIC<sup>①</sup>

#### Single-Phase, Three-Wire—120/240 Vac—Factory-Bonded Stacked Split Neutral

Main Breaker Type	Main Ampere Rating	Max. Number 3/4-Inch (19.1 mm) of Poles	Enclosure Type	Box Size	Wire Size Range Cu/Al 60 or 70°C for Main Breakers	Loadcenter Catalog Number	Cover Catalog Number <sup>②</sup>	
							Combination	Surface
CH	100	20	Indoor	C	#6–1/0	CH22B100CRN	CH8CFF	CH8CS
CSH	150	32	Indoor	J	#2–300 kcmil	CH32B150JRN	CH8JF	CH8JS
CSH	200	32	Indoor	J	#2–300 kcmil	CH32B200JRN	CH8J	CH8JS
CSH	200	42	Indoor	K	#2–300 kcmil	CH42B200KRN	CH8KF	CH8KS

#### Branch Circuit Breakers (CH)

See **Pages 2–14**.

#### Renovation Loadcenter

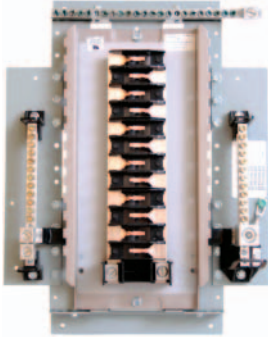
Description	Catalog Number
Five-circuit terminal block kit	<b>RN5TB</b>
Ground bar kits (two maximum per panel)	(See <b>Page 26</b> )

#### Notes

- ① 100A main breaker is rated 10 kAIC.
- ② Combination style covers may be used in surface or flush applications.

All main circuit breaker loadcenters are listed for use as service entrance equipment. Loadcenters are factory-bonded for service entrance applications. Remove bonding strap for separate neutral and ground bars for sub-feed applications.

Type CH Retrofit Interior



Type CH Retrofit Adjustable Interior



Type CH Retrofit Interior Collar and Assembly with Trim

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### Type CH Retrofit Interior Kits

#### Product Description

Replacing existing loadcenters and panelboards can be a time consuming and expensive job. CH retrofit kits can be the solution to save time and money. The kit consists of a standard trim to fit the interior, a picture frame trim to fit the existing box, and a field-adjustable interior assembly that includes neutral and ground bars. These are especially applicable when the existing box is flush mounted in drywall, plaster or block wall. The existing box, and many times existing wiring, can remain.

#### Features and Benefits

##### *Upgrading Existing Electrical Infrastructure Is Simple*

- Replaces vintage brands that have hard to find, expensive replacement breakers
- Allows safety upgrade to arc fault and ground fault breakers
- Maximizes number of circuits available with compact design
- Meets 2008 NEC wire bending requirements
- Eco-friendly in asbestos-filled environments
- Exclusive design

##### *Save Time and Money Throughout the Installation*

- Uses existing panel box and wires
- Eliminates expensive drywall/paint repair
- Saves 2–3 hours compared to a complete panel changeout—get off the job faster
- Eliminates precise measurements with field-adjustable kit

#### Detailed Product Guide

All standard retrofit kits are suitable for a range of existing box sizes:

- Box width ranging from 14.50 to 22.00 inches (368.3 to 558.8 mm)
- Box depth ranging from 4.25 inches (108.0 mm) for CH to 6.00 inches (152.4 mm)
- Box height ranging from 21.00 to 45.00 inches (533.4 to 1143.0 mm)

For box dimensions outside of these ranges, contact the Lincoln Flex Center at 800-330-6479. Be sure to provide the existing incoming line wire size.

#### Standards and Certifications

Interiors are UL recognized under UL 67, Panelboard standard.

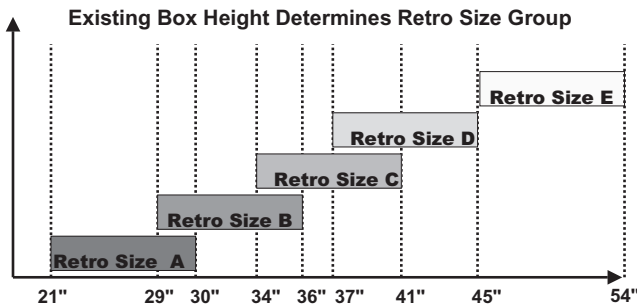


### Product Selection

To select the retrofit kit:

- From the existing box size determine which retrofit groups are suitable (may be more than one).
- Use type of interior, number of phases, and type of main to find the selection chart.
- Select part number from chart (if main breaker, replace XXX with specific amp rating).
- Note that the overlap of the existing wall is the retro cover size minus the existing box size. If specific measurements are needed, communicate that you need a custom trim size.
- Contact the Lincoln Flex Center at 800-330-6479 for pricing, lead-times, and order entry instructions.

### Retro Size Groups



### Retrofit Stocking Kits (BR and CH Kits Available) ①②

Five recommended groups: existing box height determines retro group size.

Description	Retrofit Kit Interior Catalog Number	Collar Catalog Number	Cover Catalog Number	Existing Enclosure Parameters—Inches (mm)			Existing Box Height Determines Retro Size Group—Inches (mm)
				Height	Width	Depth	
<b>BR-Aluminum Bus/CH-Copper Bus</b>							
BR 125A MLO 12/24 circuit retro kit	<b>RAABR12L125</b>	Included	Included	14.00–18.00 (355.6–457.2)	10.50–12.50 (266.7–317.5)	3.50–5.25 (88.9–133.35)	Retro size AA/size 14.00–21.00 (355.6–533.4)
BR 100A MCB 10/20 circuit retro kit	<b>RAABR10B100</b>	Included	Included	14.00–18.00 (355.6–457.2)	10.50–12.50 (266.7–317.5)	3.50–5.25 (88.9–133.35)	Retro size AA/size 14.00–21.00 (355.6–533.4)
BR 125A MLO 12/24 circuit retro kit	<b>RAABR12L125A</b>	Included	Included	14.00–21.00 (355.6–533.4)	10.50–15.50 (266.7–393.7)	3.50–5.25 (88.9–133.35)	Retro size AA/size 14.00–21.00 (355.6–533.4)
BR 100A MCB 10/20 circuit retro kit	<b>RAABR10B100A</b>	Included	Included	14.00–21.00 (355.6–533.4)	10.50–15.50 (266.7–393.7)	3.50–5.25 (88.9–133.35)	Retro size AA/size 14.00–21.00 (355.6–533.4)
CH interior 125A MCB 22 circuits	<b>RACH22B125I</b>	<b>RACHFRAME</b>	<b>CH8CF</b>	21.00–30.00 (533.4–762.0)	13.00–22.00 (330.2–558.8)	4.25–6.00 (108.0–152.4)	Retro size A/size 21.00–30.00 (533.4–762.0)
CH interior 125A MLO 24 circuits	<b>RACH24L125I</b>	<b>RACHFRAME</b>	<b>CH8CF</b>	21.00–30.00 (533.4–762.0)	13.00–22.00 (330.2–558.8)	4.25–6.00 (108.0–152.4)	Retro size A/size 21.00–30.00 (533.4–762.0)
CH interior 150A MCB 24 circuits	<b>RBCH24B150I</b>	<b>RACHFRAME</b>	<b>CH8EF</b>	29.00–36.00 (736.6–914.4)	13.00–22.00 (330.2–558.8)	4.25–6.00 (108.0–152.4)	Retro size B/size 29.00–36.00 (736.6–914.4)
CH interior 225A MLO 32 circuits	<b>RBCH32L225I</b>	<b>RACHFRAME</b>	<b>CH8DF</b>	29.00–36.00 (736.6–914.4)	13.00–22.00 (330.2–558.8)	4.25–6.00 (108.0–152.4)	Retro size B/size 29.00–36.00 (736.6–914.4)
CH interior 200A MCB 32 circuits	<b>RCCH32B200I</b>	<b>RCCHFRAME</b>	<b>CH8JF</b>	34.00–41.00 (863.3–1041.4)	13.00–22.00 (330.2–558.8)	4.25–6.00 (108.0–152.4)	Retro size C/size 34.00–41.00 (863.3–1041.4)
CH interior 225A MLO 42 circuits	<b>RCCH42L225I</b>	<b>RCCHFRAME</b>	<b>CH8GF</b>	34.00–41.00 (863.3–1041.4)	13.00–22.00 (330.2–558.8)	4.25–6.00 (108.0–152.4)	Retro size C/size 34.00–41.00 (863.3–1041.4)
CH interior 200A MCB 42 circuits	<b>RDCH42B200I</b>	<b>RDCHFRAME</b>	<b>CH8KF</b>	37.00–45.00 (939.8–1143.0)	13.00–22.00 (330.2–558.8)	4.25–6.00 (108.0–152.4)	Retro size D/size 37.00–45.00 (939.8–1143.0)
CH interior 225A MLO 42 circuits	<b>RDCH42L225I</b>	<b>RDCHFRAME</b>	<b>CH8KF</b>	37.00–45.00 (939.8–1143.0)	13.00–22.00 (330.0–558.8)	4.25–6.00 (108.0–152.4)	Retro size D/size 37.00–45.00 (939.8–1143.0)

#### Notes

- ① Other options are available.
- ② CH retrofit interiors and collar cartons are color coded to ensure accuracy of kit.



Circuit Analyzer



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### Circuit Analyzer

#### Product Description

Eaton’s Circuit Analyzer provides accurate testing of AFCI and GFCI devices while also testing for faulty wiring conditions.

There are other testing devices on the market, but this will be the only one available from an AFCI manufacturer. Eaton has more than 100 years of electrical control and power distribution experience, and a thorough understanding of what arc faults are all about. This experience with AFCI breakers led to developing a feature of the analyzer that will save contractors time and aggravation. It allows contractors to verify whether they have a grounded neutral simply by depressing the red Neutral Isolation test button. In this way, they will be able to determine whether they have a grounded neutral or have other neutrals connected before they leave the job site. Additionally, the Circuit Analyzer has a button that tests AFCI and two that test GFCI devices (both 40 mA and 8 mA).

#### Application Description

The Circuit Analyzer serves as a handy troubleshooting tool for contractors and electrical inspectors. It provides accurate testing of AFCI and GFCI devices while also testing for faulty wiring conditions.

#### Features, Benefits and Functions

- All-in-one tester for ground fault, arc fault and faulty wiring conditions
- Neutral isolation test button is a feature that allows the contractor to determine whether they have a grounded neutral or have other neutrals connected before leaving the job
- Additional Test button for AFCI and two that test GFCI devices (40 mA and 8 mA)
- Only product available from an AFCI manufacturer
- Three standard accessories enhance the usefulness of the Circuit Analyzer:
  - An alligator clip attachment to test hardwired circuits, such as smoke detectors, that lack a receptacle. The clip simply is attached to the smoke alarm’s terminals
  - An adapter (three-prong to two-prong) for testing in older homes that lack three-prong receptacles
  - Light socket adapter for AFCI testing when no receptacle is available. Examples are ceiling fans that contain sockets and recessed lighting
- Additionally, the Circuit Analyzer comes with a black carrying case



### Technical Data and Specifications

#### How it Works

1. Plug the tester (or one of the accessories) into the receptacle, light fixture or hardwired terminals to be tested.
2. Check the wiring LEDs on the Circuit Analyzer to determine if the circuit is wired correctly.
3. If the circuit is wired correctly, then proceed to test for neutral isolation, arc fault or ground fault conditions, depending on the breaker or receptacle type that is on the circuit.
4. To perform these tests, press the corresponding button on the Circuit Analyzer and review the results.

### Options and Accessories

#### CHSF2125



#### CHSF3125



#### CHFP



#### TDL



#### BINA



#### CHRLS



### Field Installation and Parts

Description	Ordering Quantity <sup>①</sup>	Catalog Number
Sub-feed lug blocks—two-pole, 125A, 3/4-inch (19.1 mm) spaces needed	1	CHSF2125
Sub-feed lug blocks—three-pole, 125A, 3/4-inch (19.1 mm) spaces needed	1	CHSF3125
Neutral/ground lug—add-on neutral or ground lug	1	NL20
	1	NL30
	1	NL300
Filler plates—3/4-inch (19.1 mm) space circuit breaker space	25	CHFP
CSR main circuit breaker filler plate (with hardware)	1	CSRFP
Door lock—12–42 circuits, and 100–225A	1	TDL
Sandlewood spray paint	1	SPCSW
ANSI-61 light gray touchup paint for outdoor loadcenters	1	SPC61
Isolated neutral assembly (computer circuits)	1	BINA
Circuit directory—adhesive backed	10	TCD
Cover screws	25	LCCS
Cover replacement latch 14-5/16 inch (363.55 mm) wide loadcenters only	1	CHRLS
Circuit marking strip (next to breakers)	10	CHMS
Circuit identification label (preprinted breaker labels next to breakers)	25	CHBL
Series rated caution label	25	SRL
Branch circuit numbering strip	20	CHNS
Bonding strap with screw	1	BSSUSE

#### Note

<sup>①</sup> Must be purchased in multiples of ordering quantities indicated.

# 1.1

## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

1

#### DS100H1



#### Field Installation Rainproof Conduit Hubs

Description	Conduit Size Inches (mm)	Ordering Quantity <sup>①</sup>	Catalog Number
Group 1—for use with 70, 100 and 125A MLO and MCB loadcenters and circuit breaker enclosures, and the following 150 and 200A panels: CH8B150RF, CH8B200RF	0.75 (19.1)	1	DS075H1
	1.00 (25.4)	1	DS100H1
	1.25 (31.8)	1	DS125H1
	1.50 (38.1)	1	DS150H1
	2.00 (50.8)	1	DS200H1
Group 2—for use with 150, 200 and 225A MLO and MCB loadcenters and circuit breaker enclosure except for the following 150 and 200A panels: CH8B150RF, CH8B200RF	2.00 (50.8)	1	DS200H2
	2.50 (63.5)	1	DS250H2
	3.00 (76.2)	1	DS300H2
Adapter kit—allows installing a Group 1 hub on devices arranged for Group 2 hubs	—	1	DS900AP
Group 1—small blank hub closure plate	—	1	DS900CP1
Group 2—large blank hub closure plate	—	1	DS900CP2

#### GBK14



#### Ground Bar Kits

Description (See Legend)	Length Inches (mm)	Ordering Quantity <sup>②</sup>	Catalog Number
	2.54 (64.5)	1	GBK5 <sup>②</sup>
	3.59 (91.2)	1	GBK520 <sup>②</sup>
	4.29 (109.0)	1	GBK10 <sup>②</sup>
	5.34 (135.6)	1	GBK1020 <sup>②</sup>
	4.61 (117.1)	1	GBK13 <sup>②</sup>
	5.69 (144.5)	1	GBK14 <sup>②</sup>
	6.74 (171.2)	1	GBK1420 <sup>②</sup>
	8.14 (206.8)	1	GBK21 <sup>②</sup>
	9.19 (233.4)	1	GBK2120 <sup>②</sup>
	7.94 (201.7)	1	CH9GP21 <sup>③④</sup>

#### Ground Bar Legend

- = (3) #14–#10 Cu/Al or (1) #14–#4 Cu/Al
- = (1) #6–2/0 Cu/Al
- ▣ = (1) 1/0–14 or (3) #10–12 Cu/Al
- ◐ = (1) #14–1/0 Cu/Al or (3) #14–#10 Cu/Al
- = Mounting hole

#### Grounded “B” Phase Adapters

Maximum Amperes	Three-Phase Loadcenter Types of Panels	Kit Catalog Number <sup>⑤</sup>
125	12–32 circuit main lug	CHGRD1
225	Main lug and CHH main breaker panels	CHGRD2
	CC main CB panels	CHGRD3

#### Neutral Bar Accessories

Description	Catalog Number <sup>⑥</sup>
Split neutral kit for 22 circuit 125A maximum	CHSN125C
Split neutral kit for 32 circuit 200A maximum	CHSN225J
Split neutral kit for 42 circuit 200A maximum	CHSN225K
Replacement neutral for all C type boxes	CHN125C
Replacement neutral for all D type boxes	CHN125D
Replacement neutral for all L type boxes	CHN225L
Isolated Neutral Assembly (computer circuits)	BINA



#### Notes

- ① Must be purchased in multiples of ordering quantities indicated.
- ② Distance between mounting holes is 1-3/4 inches (44.5 mm).
- ③ For single- and three-phase 400A loadcenters.
- ④ Distance between mounting holes is 2-13/32 inches.
- ⑤ Cannot be used in Safety Breaker Panels. Classic Plus Panels only.

### Mechanical Interlock Covers

Covers mechanically interlock two breakers. Type A covers interlock two CH breakers mounted across from one another. Type B covers interlock a main Type CSR breaker with a Type CH.

### Mechanical Interlocks

	Type	Fits Loadcenter Catalog Numbers	Mechanical Interlock Panel Cover Catalog Number	
			Flush	Surface
<b>CH8BRM Type A</b> 	A	CH12L125B, CH16L125B, CH12L3125B, CH14B100B	<b>CH8BFM</b>	<b>CH8BSM</b>
		CH20L125C, CH24L125C, CH18L3125C, CH24L3125C, CH22B100C, CH22N100C	<b>CH8CFM</b>	<b>CH8CSM</b>
		CH24L150D, CH32L150D, CH24L3225D, CH30L3150D	<b>CH8DFM</b>	<b>CH8DSM</b>
		CH42L225G, CH42L3225G	<b>CH8GFM</b>	<b>CH8GSM</b>
		Inner cover of Box B raintight	—	<b>CH8BRM</b>
		Inner cover of Box C raintight	—	<b>CH8CRM</b>
<b>CH8EFM Type B</b> 	B	CH24B150E, CH24B200E	<b>CH8EFM</b>	<b>CH8ESM</b>
		CH32B150J, CH32B200J, CH3242B200J, CH32N200J, CH32B225J	<b>CH8JFM</b>	<b>CH8JSM</b>
		CH42B200K, CH42N200K, CH42B225K	<b>CH8KFM</b>	<b>CH8KSM</b>
		CHPC32B150L, CHPC32B200L, CHPC32N200L	<b>CHPC8B32LFM</b>	—
		CHPC42B150L, CHPC42B200L, CHPC42N200L	<b>CHPC8B42LFM</b>	—
		CH8B150RF, CH8B200RF, CH8N200RF, CH24B150R, CH24B200R	<b>CH3RDF7M</b>	—
		CH32B150R, CH32B200R, CH32N200R, CH32B225R	<b>CH3RDF9M</b>	—
		CH42B200R, CH42N200R, CH42B225R	<b>CH3RDF10M</b>	—

# 1.1

## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

1

#### Decorator Cover Accessory

- For easy use with CH loadcenters mounted in living space
- Easily wallpapered or painted to match any decor
- Loadcenter accessory—exclusively from Eaton



Now you see it ...



... Now you don't.

#### Decorator Cover Accessory <sup>①</sup>

##### Catalog Number

##### Corresponding Cover

##### Existing CH Loadcenter Cover

CH8BF	CH8KDNB
CH8CF	CH8KDNC
CH8DF/EF	CH8KDND
CH8GF/JF	CH8KDNJ
CH8KF	CH8KDNK

#### CH Loadcenter Goof Collars

Don't let an ugly drywall problem ruin a beautiful electrical installation.

Eaton's Goof Collar is designed to cover gaps between the finished drywall and loadcenter enclosure. This is often necessary when upgrading the electrical service and the drywall surrounding the panel is damaged. The collar allows 2 inches of overhang beyond the standard flush trim.

Currently available in three sizes for the CH style loadcenters.

Goof Collars are also available for the BR style loadcenters upon request. Please contact the Lincoln Flex Center at 1-800-330-6479 for questions and product opportunities.



Before



After

#### Goof Collars

Inches (mm) Height	Width	Catalog Number	
		Loadcenter Cover	Goof Collar
26.00 (660.4)	19.00 (482.6)	CH8CF	CH8CFC1926
39.00 (990.6)	19.00 (482.6)	CH8JF	CH8JFC1939
42.00 (1066.8)	19.00 (482.6)	CH8KF	CH8KFC1942

#### Note

- <sup>①</sup> For interlock covers for loadcenters not listed in chart, please contact the Flex Center at 1-800-330-6479.

### Plug-On Circuit Breakers



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## Circuit Breakers

### Product Description

Quick-make, quick-break switch mechanism combined with inverse time element tripping operation and trip-free handle design. Type CH circuit breakers trip to the OFF position, eliminating nuisance callbacks. The thermal-magnetic trip curve avoids nuisance tripping on mild overloads while reacting almost instantaneously to severe short-circuit conditions. Multipole breakers have internal common trip connection to operate all poles simultaneously. Handles are marked with ON-OFF indication and ampere rating of the breaker.

### Special Application Plug-On Circuit Breakers—Type CH 10 kAIC 120 Vac and 120/240 Vac

#### Branch Feeder Type Arc Fault Circuit Breakers

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 and 2008 National Electrical Code.

#### Combination Type Arc Fault Circuit Breakers

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.

### Ground Fault Circuit Breakers—Ground Fault Application Notes

Single-pole Type CHGFIs are designed for use in two-wire, 120 Vac circuits. The diagram on **Page 39** shows a typical wiring configuration.

Two-pole Type CHGFIs 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.

Diagrams on **Page 39** illustrate typical wiring configurations for 120/240 Vac multiwire circuits.

The diagram on **Page 39** depicts 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 Type CHGFI is not affected by the equipment ground.

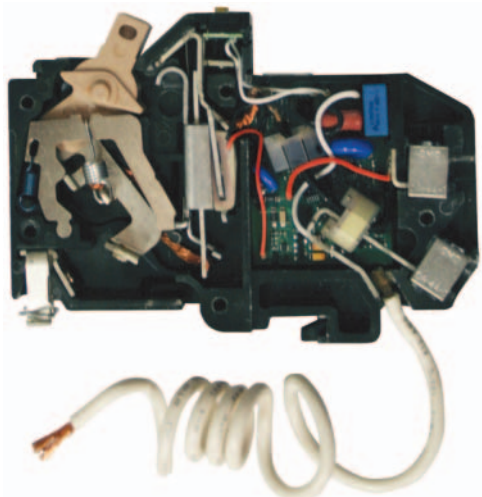
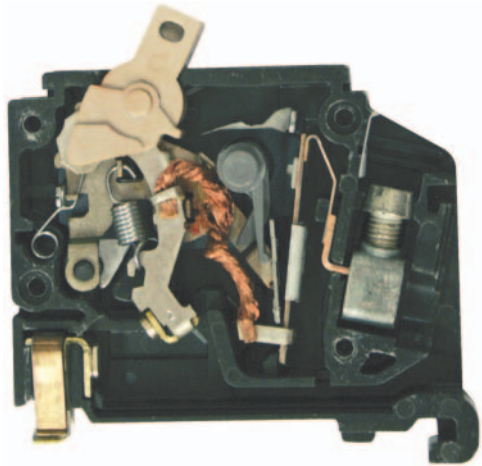
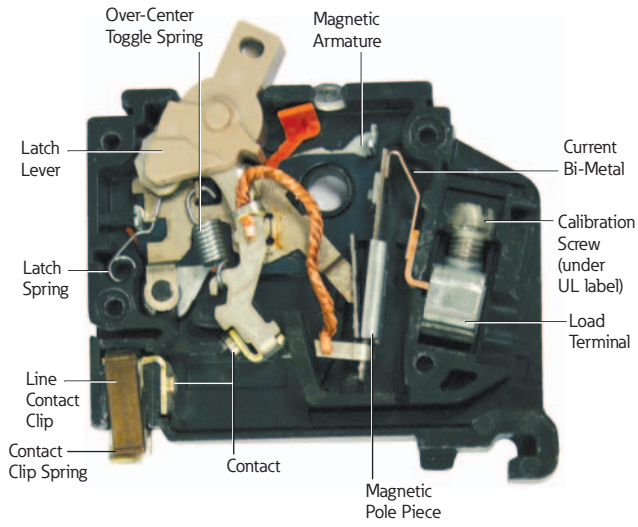
# 1.1

## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

#### 1

#### Features



*Plug-On Type CH Breaker*




### Product Selection

10 kAIC, 120 Vac, 120/240 Vac and 240 Vac

#### Plug-On Circuit Breakers



#### Type CH Breakers, 3/4-Inch (19.1 mm) per Pole 120, 120/240 or 240 Vac, 10 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Catalog Number		
		Single-Pole 120/240 Vac Requires One 3/4-Inch (19.1 mm) Space 10 per Shelf Carton	Two-Pole 120/240 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces 5 per Shelf Carton	Three-Pole 240 Vac Common Trip Requires Three 3/4-Inch (19.1 mm) Spaces 5 per Shelf Carton
10	(1) #14–8 ①	 CH110	 CH210	 CH310
15	(2) #14–10 ①② (1) #14–6 ③	CH115 ⑦⑧	CH215 ⑧	CH315 ⑧
20		CH120 ⑦⑧	CH220 ⑧	CH320 ⑧
25		CH125 ⑧	CH225 ⑧	CH325 ⑧
30		CH130 ⑧	CH230 ⑧	CH330 ⑧
15		CHF115 ⑦⑧⑩	CHF215 ⑧⑩	CHF315 ⑧
20		CHF120 ⑦⑧⑩	CHF220 ⑧⑩	CHF320 ⑧
25		CHF125 ⑧⑩	CHF225 ⑧⑩	CHF325 ⑧
30		CHF130 ⑧⑩	CHF230 ⑧⑩	CHF330 ⑧
35	#14–2 ① #14–6 ③	CH135 ⑧	CH235 ⑧	CH335 ⑧
40	#10–1/0 ④	CH140 ⑧	CH240 ⑧	CH340 ⑧
45	#14–2 ⑤ #3/0 ⑤	CH145 ⑧	CH245 ⑧	CH345 ⑧
50		CH150 ⑧	CH250 ⑧	CH350 ⑧
70		CH170	CH270	CH370
80		—	CH280	CH3080
90		—	CH290	CH3090
100		—	CH2100	CH3100
110		—	CH2110	—
125		—	CH2125	—
150		—	CH2150 ⑨	—

#### Notes

- ① For single- and two-pole breakers.
- ② Solid and stranded wire can be used together.
- ③ For three-pole breakers.
- ④ Single-pole 60–70A, two-pole 80–125A, three-pole 40–100A.
- ⑤ Single-pole 40–50A, two-pole 40–70A.
- ⑥ Two-pole 150A.
- ⑦ Switching duty rated.
- ⑧ HACR rated.
- ⑨ CH2150 requires four-pole spaces and is not suitable for use on three-phase panels, not CSA certified.
- ⑩ With trip indication.

For factory-installed options, refer to **Page 38**.

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## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

1

#### Plug-On Branch Feeder Type Arc Fault Circuit Breakers, Type CH 10 kAIC, 120 Vac and 120/240 Vac

Type CH Single-Pole AFCI Circuit Breaker



#### Type CH 3/4-Inch (19.1 mm) Wide FIRE-GUARD® AFCI Circuit Breakers

Poles	Ampere Rating	Configuration	Catalog Number
Single-pole 10 kAIC	15	AFCI	<b>CH115AF</b> ①
	20	AFCI	<b>CH120AF</b> ①
Two-Pole 10 kAIC ②③	15	AFCI common trip	<b>CH215AF</b>
	20	AFCI common trip	<b>CH220AF</b>

#### Plug-On Combination Type Arc Fault Circuit Breakers, Type CH 10 kAIC, 120 Vac and 120/240 Vac

Type CH Single-Pole PON Combo AFCI Circuit Breaker



#### Type CH 3/4-Inch (19.1 mm) Wide FIRE-GUARD Combination Type AFCI Circuit Breakers

Poles	Ampere Rating	Configuration	Catalog Number
Single-pole 10 kAIC	15	AFCI	<b>CH115CAF</b> ①
		AFCI plug-on neutral, no pigtail ④	<b>CH115CAFNP</b>
	20	AFCI	<b>CH120CAF</b> ①
		AFCI plug-on neutral, no pigtail ④	<b>CH120CAFNP</b>
Two-pole 10 kAIC	15	AFCI	<b>CH215CAF</b>
		AFCI plug-on neutral, no pigtail ④	<b>CH215CAFNP</b>
	20	AFCI	<b>CH220CAF</b>
		AFCI plug-on neutral, no pigtail ④	<b>CH220CAFNP</b>

#### Plug-On Ground Fault Circuit Breakers, Type CH 10 kAIC, 120 Vac and 120/240 Vac

Type CH Single-Pole



#### Type CH Ground Fault Circuit Breakers (5 Milliampere) 3/4-Inch (19.1 mm) per Pole 120 Vac or 120/240 Vac, 10 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Catalog Number—1 per Shelf Carton	
		Single-Pole 120 Vac Requires One 3/4-Inch (19.1 mm) Space	Two-Pole 120/240 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces
15	#14–6 ⑤	<b>CH115GF</b>	<b>CH215GF</b>
20	#14–6 ⑤	<b>CH120GF</b>	<b>CH220GF</b>
25	#14–6 ⑤	<b>CH125GF</b>	<b>CH225GF</b>
30	#14–6 ⑤	<b>CH130GF</b>	<b>CH230GF</b>
35	#14–6 ⑤	—	<b>CH235GF</b>
40	#14–6 ⑤	—	<b>CH240GF</b>
45	#14–6 ⑤	—	<b>CH245GF</b>
50	#14–6 ⑤	—	<b>CH250GF</b>
60	#14–6 ⑤	—	<b>CH260GF</b>

#### Notes

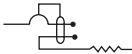
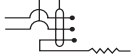
- ① Clamshell packaging available with CS modification code on the end of catalog number.
- ② Common trip refers to two-pole 240V load application sourced by 120/240 Vac (see diagram on **Page 39**).
- ③ Independent trip refers to two-pole multi-wire, home run or shared neutral circuits (see diagrams on **Page 39**).
- ④ Requires plug-on neutral loadcenter.
- ⑤ 60A breaker listed for 75°C Cu wire only.



Type CH Two-Pole



### Type CH Ground Fault Equipment Protectors (30 Milliampere) 3/4-Inch (19.1 mm) per Pole 120 Vac or 120/240 Vac, 10 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Catalog Number—1 per Shelf Carton	
		Single-Pole 120 Vac Requires One 3/4-Inch (19.1 mm) Space	Two-Pole 120/240 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces
15	#14–6 <sup>⑤</sup>	 CH115EPD	 CH215EPD
20	#14–6 <sup>⑤</sup>	CH120EPD	CH220EPD
25	#14–6 <sup>⑤</sup>	CH125EPD	—
30	#14–6 <sup>⑤</sup>	CH130EPD	CH230EPD
40	#14–6 <sup>⑤</sup>	—	CH240EPD
50	#14–6 <sup>⑤</sup>	—	CH250EPD
60	#14–6 <sup>⑤</sup>	—	CH260EPD

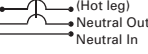
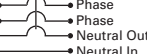
### Type CH Switching Neutral Breakers—10 kAIC, 120 Vac and 120/240 Vac

Used to open the neutral along power line(s) for applications of gas pumps.

CH220SW




### 3/4-Inch (19.1 mm) per Pole 120/240 or 240 Vac, 10 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Catalog Number—1 per Shelf Carton	
		Two-Pole 120 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces	Three-Pole 120/240 Vac Common Trip Requires Three 3/4-Inch (19.1 mm) Spaces
15	#14–8	 CH215SW <sup>②</sup>	 CH315SW <sup>③</sup>
20	#14–8	CH220SW <sup>②</sup>	CH320SW <sup>③</sup>
30	#14–8	CH230SW <sup>②</sup>	CH330SW <sup>③</sup>
40	#14–8	CH240SW <sup>②</sup>	CH340SW <sup>③</sup>
50	#14–8	CH250SW <sup>②</sup>	CH350SW <sup>③</sup>

### Type CH-HID Circuit Breakers—10 kAIC, 120 Vac, 120/240 and 240 Vac

Suitable for use in circuits for fluorescent and high intensity discharge lighting. Also suitable for HACR applications.

### 3/4-Inch (19.1 mm) per Pole 120 Vac, 120/240 and 240 Vac, 10 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°	Single-Pole 120/240 Vac Requires One 3/4-Inch (19.1 mm) Space 10 per Shelf Carton Catalog Number	Two-Pole 240 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces 5 per Shelf Carton Catalog Number	Three-Pole 240 Vac Common Trip Requires Three 3/4-Inch (19.1 mm) Spaces 5 per Shelf Carton Catalog Number
		15	#14–8	 CH115HID
20	#14–8	CH120HID	CH220HID	CH320HID
30	#14–8	CH130HID	CH230HID	CH330HID

**Notes**

- ① 60A breaker listed for 75°C Cu wire only.
- ② For circuit breakers with shunt trip, add ST suffix. Shunt trip requires one additional pole space.
- ③ Switching duty rated.
- ④ CH215HID is rated for 120/240V.

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## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

1

#### Non-CTL Plug-On Replacement Circuit Breakers, Type CHNT 10 kAIC, 120/240 Vac

For use as replacement in loadcenters built prior to 1968 and within the current style 2–8 circuit loadcenters as indicated in the loadcenter section.

#### 3/4-Inch (19.1 mm) per Pole 120 Vac, Non-CTL 10 kAIC

Single-Pole Requires  
One 3/4-Inch (19.1 mm) Space  
10 per Shelf Carton  
Catalog Number

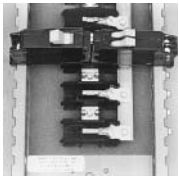
Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	
15–15	#14–8	CHNT1515 ①②
15–20	#14–8	CHNT1520 ①②
20–20	#14–8	CHNT2020 ①②



#### CTL Plug-On Circuit Breakers, Type CHT Twin 10 kAIC, 120/240 Vac

All circuit breakers have rejection feature. Use only with loadcenters marked for use with CHT breakers.

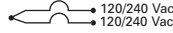
Type CH and CHT  
Circuit Breakers  
Mounted in Twin  
Breaker Panel



#### Twin (CTL) 3/4-Inch (19.1 mm) per Pole 120 Vac Class CTL 10 kAIC

Single-Pole Requires  
One 3/4-Inch (19.1 mm) Space  
10 per Shelf Carton  
Catalog Number

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	
15–15	#14–8	CHT1515 ①②
15–20	#14–8	CHT1520 ①②
20–20	#14–8	CHT2020 ①②






#### Notes

- ① Switching duty rated.
- ② HACR rated.

### Type CHP Commercial Breakers—10 kAIC, 120 Vac, 120/240 Vac and 240 Vac

**Note:** CHP breakers feature on-off and trip positions for commercial applications.

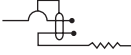
#### 3/4-Inch (19.1 mm) per Pole 120, 120/240 or 240 Vac, 10 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Single-Pole 120/240 Vac Requires One 3/4-Inch (19.1 mm) Space 10 per Shelf Carton Catalog Number	Two-Pole 120/240 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces 5 per Shelf Carton Catalog Number	Three-Pole 240 Vac Common Trip Requires Three 3/4-Inch (19.1 mm) Spaces 5 per Shelf Carton Catalog Number
				
10	(1) #14–8 ①	CHP110	CHP210	CHP310
15	(2) #14–10 ①② (1) #14–6 ③	CHP115 ⑥⑦	CHP215 ⑦	CHP315 ⑦
20		CHP120 ⑥⑦	CHP220 ⑦	CHP320 ⑦
25		CHP125 ⑦	CHP225 ⑦	CHP325 ⑦
30		CHP130 ⑦	CHP230 ⑦	CHP330 ⑦
35	#14–2 ① #14–6 ③	CHP135 ⑦	CHP235 ⑦	CHP335 ⑦
40	#10–1/0 ④	CHP140 ⑦	CHP240 ⑦	CHP340 ⑦
45	#14–2 ⑤	CHP145 ⑦	CHP245 ⑦	CHP345 ⑦
50		CHP150 ⑦	CHP250 ⑦	CHP350 ⑦
60		CHP160 ⑦	CHP260 ⑦	CHP360 ⑦
70		CHP170	CHP270	CHP370
80		—	CHP280	—
90		—	CHP290	—
100		—	CHP2100	CHP3100
110		—	CHP2110	—
125		—	CHP2125	—

### Type CHP-GFCI Circuit Breakers—10 kAIC, 120 Vac and 120/240 Vac

**Note:** CHP breakers offer on-off and trip positions for commercial applications.

#### 5 Milliampere—3/4-Inch (19.1 mm) per Pole 120V and 120/240 Vac, 10 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Single-Pole 120 Vac Requires One 3/4-Inch (19.1 mm) Space 1 per Individual Carton Catalog Number
		
15	#14–6	CHP115GF
20	#14–6	CHP120GF
30	#14–6	CHP130GF

#### Notes

- ① For single- and two-pole breakers.
- ② Solid and stranded wire can be used together.
- ③ For three-pole breakers.
- ④ Single-pole 60–70A, two-pole 80–125A, three-pole 40–100A.
- ⑤ Single-pole 40–50A, two-pole 40–70A.
- ⑥ Switching duty rated.
- ⑦ HACR rated.

CHP breakers offer on-off and trip positions for commercial applications.

# 1.1

## Loadcenters and Circuit Breakers

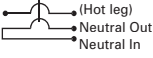
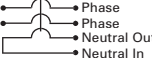
### Type CH Loadcenters and Circuit Breakers

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#### Type CHP Neutral Switching Breakers—10 kAIC, 120 Vac and 120/240 Vac



Used to open the neutral along power line(s) for applications of gas pumps.

#### 3/4-Inch (19.1 mm) per Pole 120 or 120/240 Vac, 10 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Two-Pole 120 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces 1 per Shelf Carton Catalog Number	Three-Pole 120/240 Vac Common Trip Requires Three 3/4-Inch (19.1 mm) Spaces 1 per Shelf Carton Catalog Number
			
15	#14–8	CHP215SW ①	CHP315SW ①
20	#14–8	CHP220SW ①	CHP320SW ①



#### Type CH-M50 High Ambient Breaker

#### 3/4-Inch (19.1 mm) per Pole 120 or 120/240 Vac, 10 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Single-Pole 120/240 Vac Requires One 3/4-Inch (19.1 mm) Space 10 per Shelf Carton Catalog Number	Two-Pole 120/240 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces 5 per Shelf Carton Catalog Number
			
15	(1) #14–8	CH115M50	CH215M50
	(2) #14–10	CH120M50	CH220M50
20		CH125M50	CH225M50
25		CH130M50	CH230M50
30		CH135M50	CH235M50
35		CH140M50	CH240M50
40		CH145M50	CH245M50
45		CH150M50	CH250M50
50		—	CH260M50
60		—	CH270M50
70		—	—

#### Type CH-HM and CHP-HM High Magnetic Breakers

#### 3/4-Inch (19.1 mm) per Pole 120 or 120/240 Vac, 10 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Single-Pole 120/240 Vac Requires One 3/4-Inch (19.1 mm) Space 10 per Shelf Carton Catalog Number	Two-Pole 120/240 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces 5 per Shelf Carton Catalog Number
			
15	(1) #14–8	CH115HM	CH215HM
	(2) #14–10	CH120HM	CH220HM
20		CHP115HM	CHP215HM
	(2) #14–10	CHP120HM	CHP220HM

#### Note

① For circuit breakers with shunt trip, add ST suffix. Shunt trip requires one additional pole space, obtain pricing from [Page 38](#).

### Options and Accessories

#### CHHT



#### CHPL



#### CHPLGF



#### MCBPL



#### CHLO



#### CH125RB



#### CH9MB270



#### CHML



### Field Installation Kits and Parts

Description	Ordering Quantity <sup>①</sup>	Catalog Number
<b>Handle Ties <sup>②</sup></b>		
Handle tie bar for physically joining the handles of two adjacent single-pole Type CH circuit breakers (molded plastic handle cover)	25	CHHT
<b>Handle Lockoffs <sup>③④</sup></b>		
Padlockable device for locking the handle of single-, two- or three-pole Type CH circuit breakers (escutcheon mounted) <sup>⑤</sup>	1	CHPL
Padlockable device for locking the handle of a single-, two- or three-pole Type CHGFI circuit breaker (escutcheon mounted) <sup>⑤</sup>	1	CHPLGF
Padlockable device for locking the handle of main circuit breaker Types CC and CCH into the ON or OFF position.(screw mounted) <sup>⑥</sup>	1	CCPL
Padlockable device for locking the handle of main breaker Types BW and CSR into the ON or OFF position (escutcheon mounted) <sup>⑤</sup>	1	MCBPL
<b>Handle Lockdogs <sup>④⑦</sup></b>		
Device used to secure handle in ON or OFF position for single-pole Type CH circuit breakers (handle mounted) <sup>⑧</sup>	10	CHLO
<b>Hold-Down Kits <sup>⑧</sup></b>		
Hold-down retainer kit for single-, two-, three-pole Type CH circuit breakers. For 6–24 circuit 125A single- and three-phase, 12–42 circuit single-phase 225A and 24–42 circuit three-phase 225A MLO Type CH loadcenters	1	CH125RB
Hold-down retainer kit for single-, two-, three-pole Type CH circuit breakers for 2–4 circuit MLO CH loadcenters.	1	CH125RB24
<b>Mounting Bases</b>		
Mounting base for two-pole Type CH circuit breaker—70A maximum	1	CH9MB270
<b>Main Breaker Lug Kits</b>		
Types CC and CCH main breaker lug kit (2) 300 kcmil	1	CCL300
Type CSR main breaker lug kit (2) 300 kcmil	1	MCBL300
<b>Mechanical Interlock</b>		
Type CH for two-, three- and four-pole breakers	10	CHML
	10	CHPLOFF
	10	CHPLOFFA
	10	CHL1P
	10	CHL2P

#### Notes

- ① Must be purchased in multiples of ordering quantities indicated.
- ② Handle ties: typically used to join two similar independent single-pole breakers to form a two-pole noncommon trip breaker.
- ③ Handle lockoffs: devices that use a padlock to lock the circuit breaker's handle in the ON or OFF position.
- ④ Requires one additional pole space.
- ⑤ Escutcheon mounted: device mounted semipermanently to the face of the circuit breaker and secured by the loadcenter deadfront.
- ⑥ Screw mounted: device permanently mounted to the face of the circuit breaker by the use of a non-removable screw.
- ⑦ Handle lockdogs: devices that are used to secure a circuit breaker's handle in the ON or OFF position. Handle lockdogs are not padlockable devices.
- ⑧ Handle mounted: device mounted above or below handle using spring pressure.
- ⑧ Hold-down kits: devices used to secure the circuit breaker to the loadcenter for back-feed main application. See NEC Article 384-16(g).

# 1.1

## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

#### 1

#### Shunt Trip Options

Description Type	Volts	Catalog Number Suffix Adder <sup>①</sup>
CSR	12 DC	<b>SR12</b>
CSR	24 DC	<b>SR24</b>
CSR	120 AC	<b>SR01</b>
CH	120 AC	<b>ST</b> <sup>②</sup>
CC	12 DC	<b>SR12</b>
CC	24 DC	<b>SR24</b>
CC	120 AC	<b>SR01</b>
CC	208 AC	<b>SR08</b>
CC	240 AC	<b>SR02</b>

#### Handle Position Changeability Chart

Handle Lockoff and Lockdog Types	To Change Handle Position from ON to OFF or OFF to ON You Must...		
	Remove Padlock	Remove Device	Remove Loadcenter Deadfront
Lockoff escutcheon mounted	Remove	—	—
Lockoff screw mounted	Remove	—	—
Lockdog handle mounted	N/A	Remove	—

#### Notes

- <sup>①</sup> Add suffix indicated to end of breaker catalog number.
- <sup>②</sup> Requires one additional pole space.

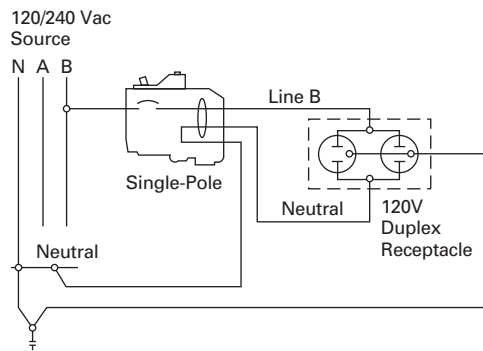
### Technical Data and Specifications

#### Ratings

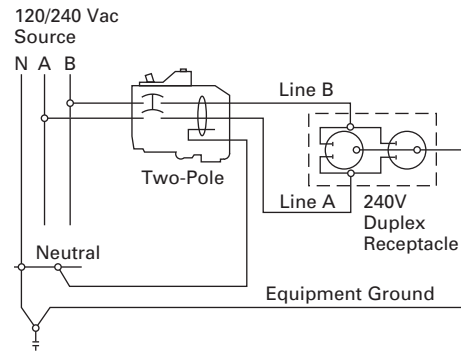
Single- and two-pole CH breakers rated 15 and 20A have low instantaneous magnetic trip levels. The 15 and 20A breakers with "HM" suffix have high magnetic trip settings recommended for circuits with inherently high inrush currents. All Type CH breakers are marked for heating, air conditioning and refrigeration (HACR) equipment application. Single-pole 15–20A breakers are also suitable for switching duty (SWD). Shunt trip coils operate on 120 Vac and require one additional pole space per breaker.

### Wiring Diagrams

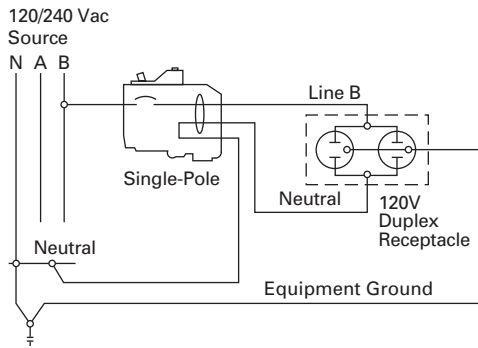
#### Typical Single-Pole



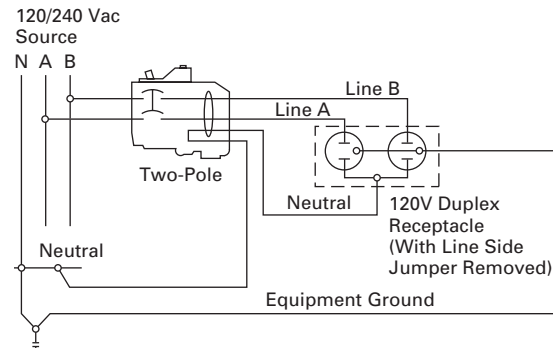
#### Two-Pole 240V Load Application Sourced by 120/240 Vac



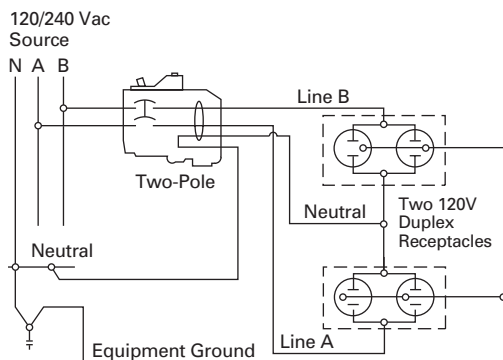
#### Single-Pole 120V Load Application Sourced by 120/240 Vac



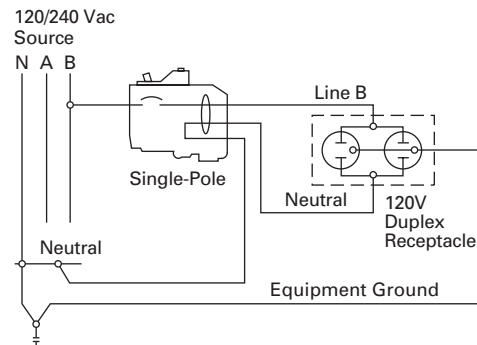
#### Two-Pole Shared Neutral with Duplex Receptacle Application



#### Two-Pole Shared Neutral with Multi-Duplex Receptacle Application



#### Single-Pole 120V Duplex Receptacle Application

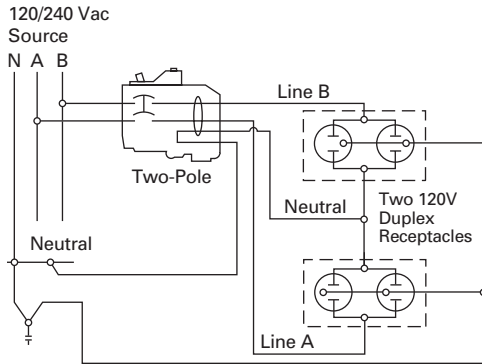


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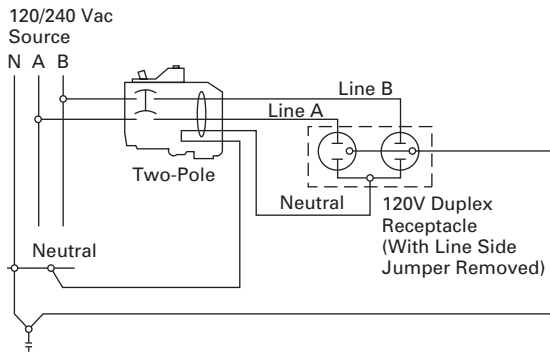
## Loadcenters and Circuit Breakers

Type CH Loadcenters and Circuit Breakers

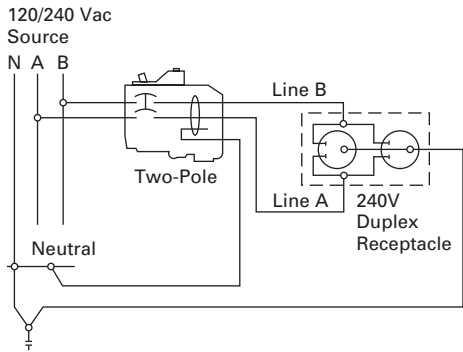
### 1 Two-Pole 120V Multi-Duplex Receptacle Application



### Two-Pole 120V Duplex Receptacle Application



### Two-Pole 240V Duplex Receptacle Application





### Dimensions

Approximate Dimensions in Inches (mm)

#### Residential/Commercial/Unit Enclosure—Box Sizes

**Note:** Box sizes do not include covers/fronts.

#### Residential Loadcenters

Box Size	Height	Width	Depth
<b>NEMA Type 1 Indoor</b>			
5	9.50 (241.3)	4.50 (114.3)	3.13 (79.4)
6	11.38 (288.9)	6.88 (174.6)	3.39 (86.1)
7	13.00 (330.2)	11.00 (279.4)	3.69 (93.7)
B	16.75 (425.5)	14.31 (363.5)	3.88 (98.4)
C	21.00 (533.4)	14.31 (363.5)	3.88 (98.4)
D	29.13 (739.8)	14.31 (363.5)	3.88 (98.4)
E	29.13 (739.8)	14.31 (363.5)	3.88 (98.4)
G	34.13 (866.8)	14.31 (363.5)	3.88 (98.4)
J	34.13 (866.8)	14.31 (363.5)	3.88 (98.4)
K	37.00 (939.8)	14.31 (363.5)	3.88 (98.4)
L	39.00 (990.6)	14.31 (363.5)	3.88 (98.4)

Box Size	Height	Width	Depth
<b>NEMA Type 3R Outdoor</b>			
5R	9.50 (241.3)	4.50 (114.3)	3.13 (79.4)
6R	11.75 (298.5)	6.50 (165.1)	4.50 (114.3)
7R	13.00 (330.2)	11.00 (279.4)	3.69 (93.7)
B	16.75 (425.5)	14.31 (363.5)	5.19 (131.8)
C	21.00 (533.4)	14.31 (363.5)	5.19 (131.8)
D	29.13 (739.8)	14.31 (363.5)	5.19 (131.8)
E	29.13 (739.8)	14.31 (363.5)	5.19 (131.8)
G	34.13 (866.8)	14.31 (363.5)	5.19 (131.8)
J	34.13 (866.8)	14.31 (363.5)	5.19 (131.8)
K	37.00 (939.8)	14.31 (363.5)	5.19 (131.8)
L	39.00 (990.6)	14.31 (363.5)	5.19 (131.8)

#### Commercial Loadcenters

Box Size	Height	Width	Depth
<b>NEMA Type 1 Indoor</b>			
P	54.38 (1381.1)	21.00 (533.4)	6.00 (152.4)
PM	62.63 (1590.7)	21.00 (533.4)	6.00 (152.4)

#### Types ECB and ECC Unit Enclosures

Height	Width	Depth
<b>NEMA Type 1 Indoor</b>		
23.25 (590.6)	8.88 (225.4)	4.50 (114.3)
<b>NEMA Type 3R Outdoor</b>		
23.69 (601.7)	9.31 (236.5)	5.44 (138.1)

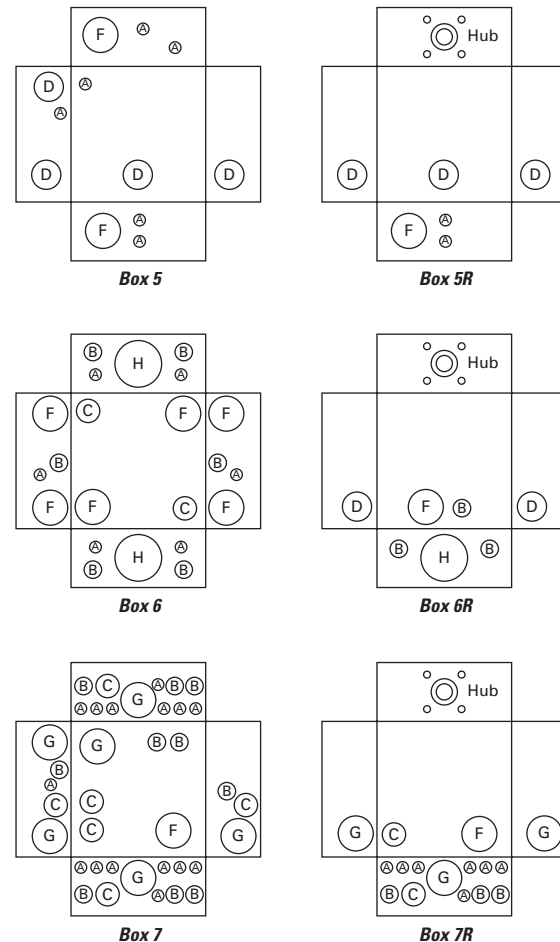
#### Residential Loadcenter Knockout

Residential NEMA Type 1 Indoor and NEMA Type 3R Outdoor Enclosures.

#### Knockouts for Box Sizes 5, 6, 7, 5R, 6R, 7R

Code	Diameter			
A	0.50 (12.7)	—	—	—
B	0.50 (12.7)	0.75 (19.1)	—	—
C	0.50 (12.7)	0.75 (19.1)	1.00 (25.4)	—
D	0.50 (12.7)	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)
E	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)	—
F	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)
G	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)	—
H	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)
I	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)	—

#### Knockout Positions



# 1.1

## Loadcenters and Circuit Breakers

### Type CH Loadcenters and Circuit Breakers

1

Approximate Dimensions in Inches (mm)

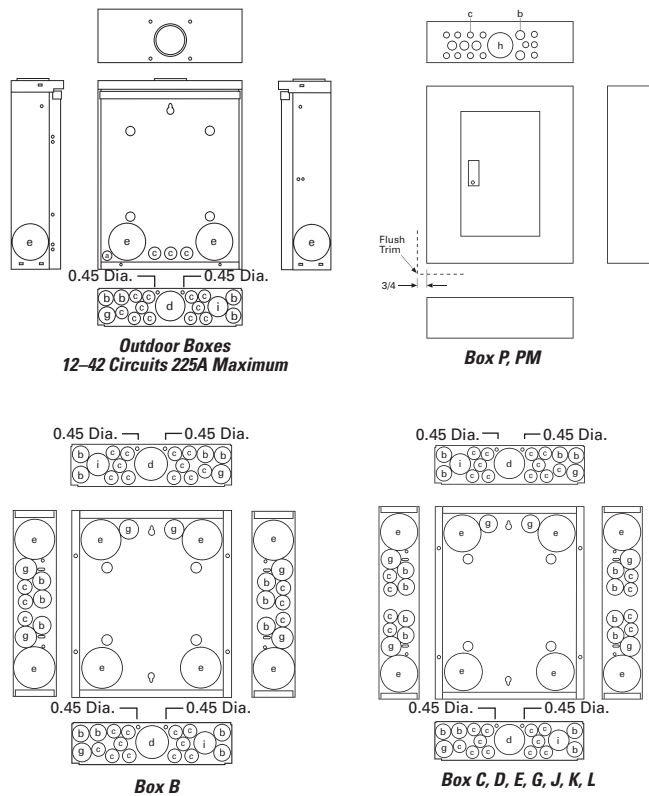
#### Residential and Commercial Loadcenter Knockout

Residential NEMA Type 1 indoor and NEMA Type 3R outdoor enclosures.

#### Knockouts for Box Sizes 8, 8R, P, PM, B, C, D, E, G, J, K, L and Outdoor Boxes 12–42 Circuits

Code	Diameter				
a	0.75 (19.1)	—	—	—	—
b	0.50 (12.7)	0.75 (19.1)	—	—	—
c	0.50 (12.7)	—	—	—	—
d	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)	2.50 (63.5)
e	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)	2.50 (63.5)	—
f	0.75 (19.1)	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)	—
g	0.50 (12.7)	0.75 (19.1)	1.00 (25.4)	—	—
h	1.50 (38.1)	2.00 (50.8)	2.50 (63.5)	—	—
i	0.50 (12.7)	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)
j	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)	—	—
k	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)	—	—
m	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)
n	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)	—
p	2.00 (50.8)	2.50 (63.5)	—	—	—

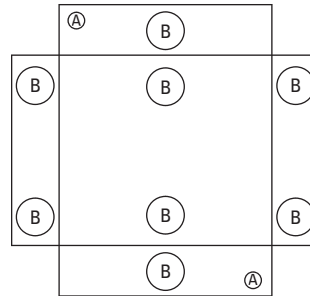
#### Knockout Diagram



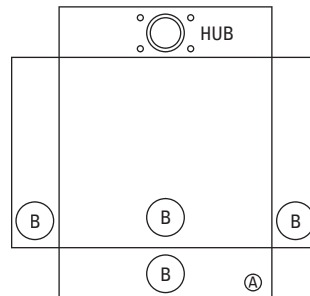
#### Type ECB and ECC Unit Enclosure Knockout

Code	Diameter in Inches				
<b>NEMA Type 1 Indoor (Flush and Surface Trims)</b>					
A	0.50 (12.7)	—	—	—	—
B	1.25 (31.8)	1.50 (38.1)	1.75 (44.5)	2.00 (50.8)	2.50 (63.5)
<b>NEMA Type 3R Outdoor</b>					
A	0.50 (12.7)	—	—	—	—
B	1.25 (31.8)	1.50 (38.1)	1.75 (44.5)	2.00 (50.8)	2.50 (63.5)

#### NEMA Type 1—Indoor



#### NEMA Type 3R—Outdoor



### Type BR Loadcenters and Circuit Breakers



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## Overview

### Product Selection Guide

#### BR Loadcenters

##### Description

##### Service

Single-phase, three-wire, 120/240 Vac

Three-phase, four-wire, 208Y/120 Vac  
Three-phase, three-wire, 240 Vac delta

##### Short-Circuit Current Rating

10 kAIC: All single- and three-phase loadcenters 70–225A, 8 to 42 circuits  
22 kAIC: All convertible loadcenters using 125A rated Type BRH main breakers or selected factory installed 125A rated Type BRH main breaker

25 kAIC: All convertible and factory-installed single-phase loadcenters rated 150 and 200A using Type BWH main breakers

##### Main Breaker/Main Lug Loadcenters

Single-phase  
Main breaker: 100, 125, 150, 200, 225, 400, 600A  
Main lugs: 70, 125, 150, 200, 225, 400, 600A

Three-phase  
Main breaker: 100, 125, 150, 200, 225, 400, 600A  
Main lugs: 100, 125, 150, 200, 225, 400, 600A

##### Convertible Loadcenters

Main breaker: single-phase up to 200A and three-phase up to 225A

Main lugs: single-phase up to 200A and three-phase up to 150A

##### Branch Breakers

Types BR, BRH and BRHH: 10–150A, single-, two- and three-pole; selected amperage available in switching duty, HACR, shunt trip and high magnetic setting  
Type GFCB: 15–60A  
Types BJ and BJH: 125–225A; two- and three-pole  
Type BD Twin: 10–50A; two of one-pole; take one 1-inch (25.4 mm) space

Type BQ and BQC Multibreaker: 15–30A. Two of two-pole or one two-pole and two one-pole; takes two 1-inch (25.4 mm) spaces  
Type BRW: 15–30A; two-pole water heater breakers  
Type BRSN: 15–30A; two-pole switching neutral breakers  
Type BR 15–100A; two-pole, 240 Vac delta breakers  
BR-AFCI arc fault circuit interrupter

##### Enclosures

NEMA Type 1 indoor  
NEMA Type 3R outdoor

NEMA 4X  
Meets or exceeds UL requirements for indoor or outdoor applications

##### Loadcenter and Breaker Accessories

Branch circuit breaker:  
Auxiliary components    Hold-down kits    Handle ties  
Lockoffs                    Lockdogs

Complete line of ground bar kits 5, 10, 14 and 21 circuit, some with additional #2/0 lugs; each terminal will accommodate: (3) #14–#10 Cu/Al or (1) #14–#4 Cu/Al  
Main and sub-feed lugs 125, 150, 225A—two- and three-pole  
Shunt trips

Surge protection:  
Single-phase plug-on surge protector    Single-phase bottle type surge protector  
Three-phase bottle type surge protector    Single-phase whole home surge protector

Universal rainproof conduit hubs  
Group One: 3/4, 1, 1-1/4, 1-1/2, 2 inches (19.1, 25.4, 31.8, 38.1, 50.8 mm)  
Group Two: 2, 2-1/2, 3 inches (50.8, 63.5, 76.2 mm)

Adapter plate

##### Bussing

Tin-plated aluminum as standard

Limited copper bus panels available

## 1

**Product Description**

Loadcenters are enclosures specifically designed to house the branch circuit breakers and wiring required to distribute power to individual circuits. They contain either a main breaker when used at the service entrance point or a main lug when used as a sub-panel to add circuits to existing service. The main breaker protects the main entire panel and can be used as a service disconnect. The branch breakers protect the wires leading to individual electrical loads such as fixtures and outlets.

**Features, Benefits and Functions****Loadcenter Construction**

Eaton's Type BR loadcenters have standard tin-plated aluminum bus with a limited availability of copper bus. The sum of the handle ratings connected to any stab is limited to 150A maximum on the 100 and 125A loadcenters, and 200A on loadcenters with 150A or higher main bus. NEMA Type 1 boxes or enclosures are manufactured from galvanized steel. Raintight boxes are manufactured from galvanized steel, then finished using an electrostatic powder coat, baked urethane paint process.

**Neutrals**

Eaton's Type BR loadcenters feature three types of neutrals:

**Insulated/Bondable Single/Split Neutral**

Panels are supplied with an insulated neutral and a bonded ground. For service entrance applications, the insulated neutral must be bonded utilizing the bonding strap supplied with the panel. When used as a service entrance panel, the bonded ground may be used as a neutral and/or ground, unused neutral holes on either side may be used for termination of equipment grounds. For non-service entrance (sub-panel) applications, the panel may be installed with bonding strap not connected to the neutral (the bonded ground must be used as a ground only).

**Insulated/Bondable Single Neutral**

Panels are supplied with a single insulated neutral. For service entrance applications, all that is required to bond the neutral is to loosen the bonding screw and the neutral screw directly beside it, insert the bonding strap into the neutral bar, and re-tighten both connections. The single neutral can be moved by the contractor to the other side of the panel, if desired. When used as a service entrance panel, unused neutral connections may be used for the termination of equipment grounds. For non-service entrance (sub-panel).

**Insulated/Bondable Split Neutral**

Panels are supplied with twin insulated neutrals with an insulated cross strap. For service entrance applications, the neutral must be bonded utilizing the bonding strap supplied with the panel. For non-service entrance (sub-panel) applications, the panel may be installed with bonding strap not connected to the neutral. Separate ground bars must be used on non-service entrance panels.

**Grounds**

In service entrance applications where the neutral is bonded, unused neutral holes may be used for terminating ground conductors. In sub-feed panels, the neutral must be isolated (non-bonded), and ground wires must be terminated on a separate ground bar.

The insulated/bondable single/split neutral panels have sufficient terminations for both ground and neutral conductors. The insulated/bondable single split neutral panels are supplied with a separate factory-installed ground bar if the catalog number contains a "G." If not, a separate ground bar should be installed. Insulated/Bondable Single Neutral panels are supplied without a ground bar (unless otherwise noted), and ground bar kits if needed must be purchased separately.

**Neutral and Ground Terminals**

The standard terminals on grounds and neutrals are rated to accept (3) #14-#10 Cu/Al or (1) #14-4, provided the cables terminated are of the same material. For larger cables, add-on neutral lugs may be ordered from the accessories on **Page 71**.

**Note:** NEC allows only one current carrying conductor per hole on neutrals unless otherwise noted.

**Bottom Fed Loadcenters**

For single-phase 225A and below loadcenters that are bottom fed, a standard panel can be rotated 180 degrees to allow straight-in wiring of power cables to the main terminals. Because the main circuit breaker handle operates horizontally, the orientation of the main circuit breaker handle is consistent with the requirements of NEC 2008 Article 240.81.

**Gutter Splicing**

Loadcenters are not UL listed as wiring troughs. Therefore, gutter splicing of riser cables to tap off to the main device is not permitted. Refer to NEC 2008 Article 312.8.

**Fire Rating**

Due to the numerous openings in both loadcenter boxes and trims, they should not be mounted in firewalls. There is no approved method for sealing the enclosures for this application.

**Date Code**

The date of manufacture of each loadcenter is printed on the outside of the carton as well as inside the loadcenter. On the carton, the date code is printed on the end carton label. In the loadcenter, the date code is located on the small white label located on the right side wall (with the main device on top).

The date code is in the following format: F # # # &. The “F” is the numeric code for the Lincoln, IL plant, and the three numbers are the year and week of manufacturing, e.g., 023. The “!” sign at the end signifies the decade of the 2010. Therefore, the date code F023& would indicate that the product was manufactured in the 23rd week of 2010. The 1980s are represented by the “+” sign and the 1990s are represented by a “=” at the end of the code.

**Surge Protectors**

Complete home surge protection is available in multiple options, including a factory-installed option that provides the highest level of surge protection in a residential design. See Tab 3 for more details.

**Circuit Breaker Case Interrupting Capacity**

- 10 kAIC
- 22 kAIC

**Warranty Information**

- 10-year limited loadcenter warranty
- 10-year limited branch breaker warranty

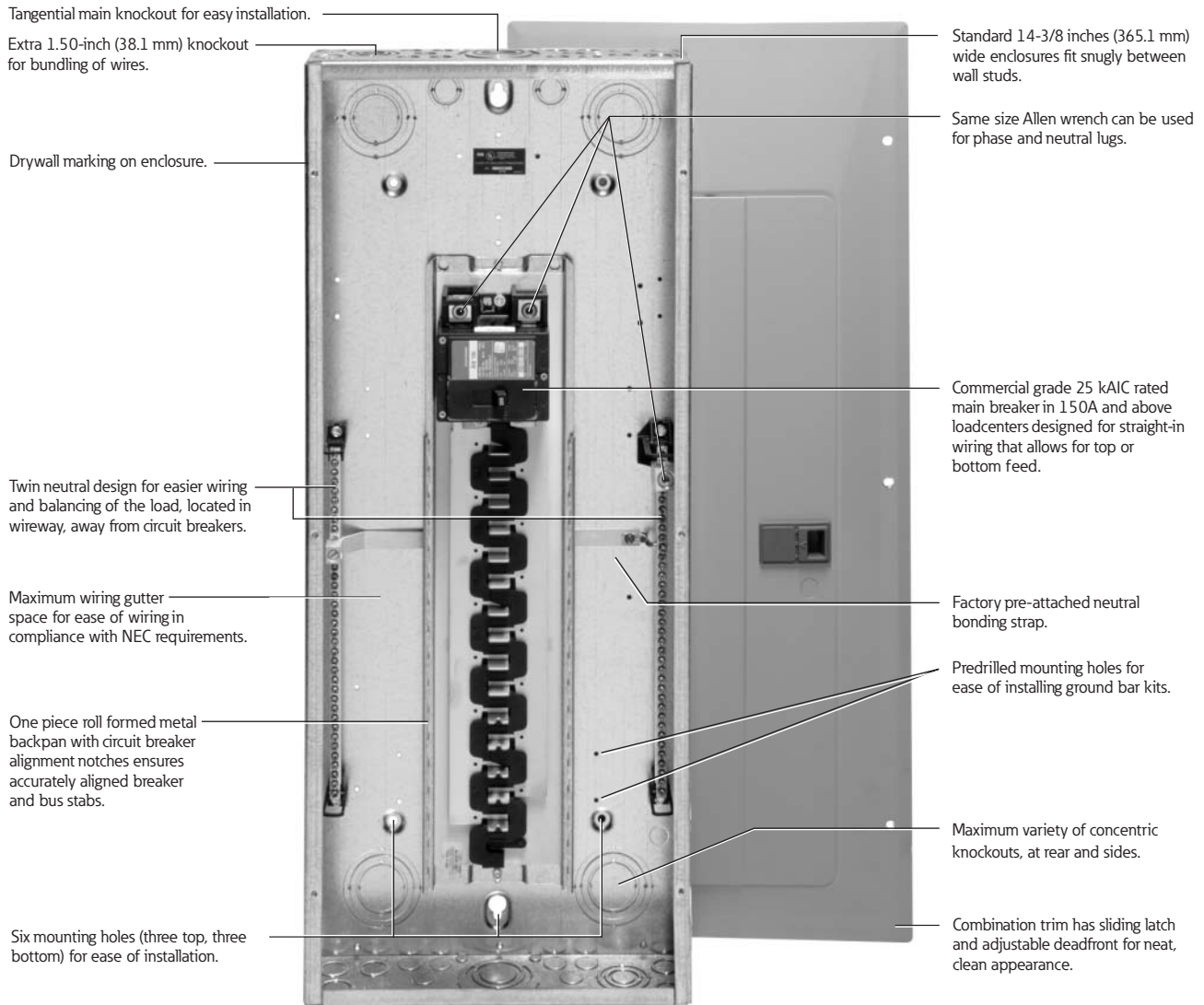
# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

1

#### Type BR Loadcenter—BR4040B200



### Standards and Certifications

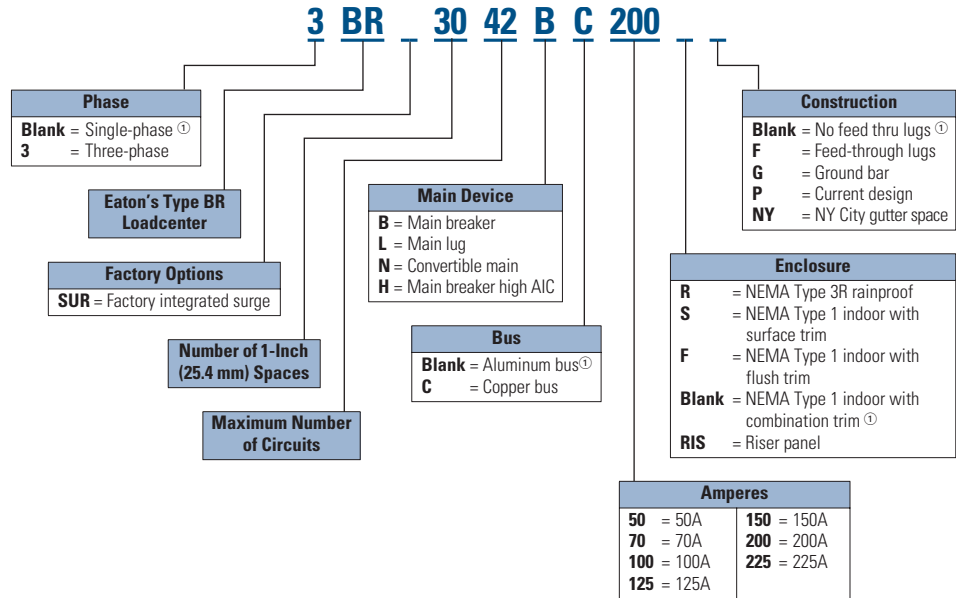
#### UL Listings

All Eaton Type BR loadcenters are listed under UL File E52977 except the 2–8 circuit loadcenters, up through and including 125A, which are listed under UL File E8741.



### Catalog Number Selection

#### Single- and Three-Phase Through 225A



#### Note

① No character space used.

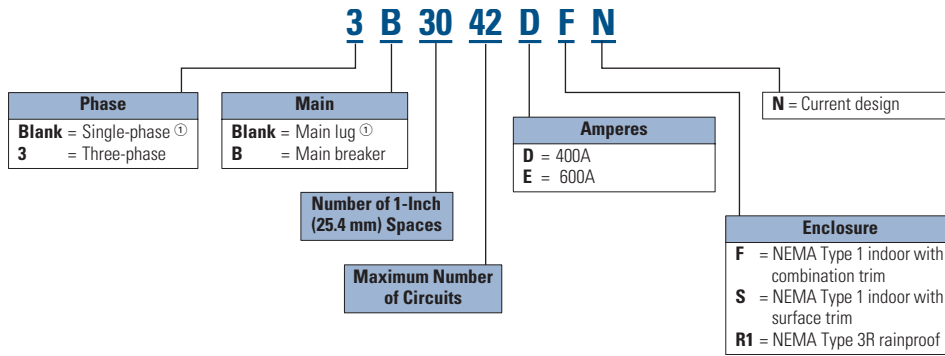
# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

1

#### Single- and Three-Phase 400–600A



Example No. 1: BR1224L125G

Single-phase Type BR loadcenter rated at 125A with main lugs, 12 spaces allowing 24 poles, indoor combination enclosure, aluminum bus and ground bar.

Example No. 2: BR24L70RP

Single-phase Type BR loadcenter rated at 70A with main lugs, two spaces allowing four poles, rainproof enclosure with aluminum bus.

Example No. 3: 3B4242EFN

Three-phase Type BR loadcenter rated at 600A with main breaker, 42 spaces allowing 42 poles, indoor combination enclosure.

### Product Selection

#### Single-Phase—Main Circuit Breaker Loadcenters—10/25 kAIC

BR4040B200



#### Single-Phase, Three-Wire—120/240 Vac—Factory-Bonded Split Neutral

Main Breaker Type	Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Loadcenter Catalog Number with Combination Cover ②
		Space	Circuits				
BR 10 kAIC	100	20	20	Indoor	C2	#4–1/0	<b>BR2020B100</b>
	100	16	24	Indoor	C1		<b>BR1624B100</b>
BWH 25 kAIC	150	30	30	Indoor	G1	#2–300 kcmil	<b>BR3030B150</b>
	200	20	40	Indoor	D1	#2–300 kcmil	<b>BR2040B200</b>
	200	30	40	Indoor	G1		<b>BR3040B200</b>
	200	40	40	Indoor	L1		<b>BR4040B200</b>

#### Notes

① No character space used.

② Combination style covers may be used in surface or flush applications.

All main circuit breaker loadcenters are listed for use as service entrance equipment. Loadcenters are factory-bonded for service entrance applications. Remove bonding strap for separate neutral and ground bars for sub-feed applications.



### Single-Phase Three-Wire—120/240 Vac—Insulated/Bondable Neutral



Main Breaker Type	Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Loadcenter Catalog Number with Combination ① or NEMA Type 3R Cover			
		Spaces	Circuits							
BR816B100 BR 10 kAIC	100	8	16	Indoor	B1	#4-1/0 ②	BR816B100			
		10	20	Indoor	A1		BR1020B100S11			
		10	20	Indoor	A1		BR1020B100F11			
		10	20	Outdoor	B2R		BR1020B100RF ③④			
		12	12	Indoor	B2		BR1212B100			
		12	20	Indoor	B2		BR1220B100			
		12	24	Outdoor	B2R		BR1224B100R ④			
		16	16	Indoor	C1		BR1616B100			
		16	20	Indoor	C1		BR1620B100			
		16	24	Outdoor	C1R		BR1624B100R ④			
		20	24	Outdoor	C3R		BR2024B100R ④			
		30	30	Indoor	⑤		⑤	⑤		
		125	125	16	24		Indoor	C1	#4-2/0	BR1624B125
				20	24		Indoor	C1		BR2024B125
20	24			Outdoor	C3R	BR2024B125R ④				
BRH ⑥ 22 kAIC	100	20	24	Indoor	C2	#2/0-300 kcmil	BR2024H100 ⑥			
BR2030B150 BWH ⑦ 25 kAIC	150	8	16	Outdoor	C3R	#2-300 kcmil	BR816B150RF ③④			
		16	30	Indoor	C4		BR1630B150			
		20	30	Indoor	C4		BR2030B150			
		20	30	Outdoor	D1R		BR2030B150R ④			
		20	40	Indoor	D1		BR2040B150			
		20	40	Outdoor	D1R		BR2040B150R ④			
		24	30	Indoor	G1		BR2430B150			
		30	30	Outdoor	G1R		BR3030B150R ④			
		30	40	Indoor	G1		BR3040B150			
		200	200	4	8		Outdoor	8R	#2-300 kcmil	BR48B200RF ③⑧⑨
	8			16	Outdoor	C3R	BR816B200RF ③④			
	16			32	Indoor	C4	BR1632B200			
	20			40	Outdoor	D1R	BR2040B200R ④			
	24			40	Indoor	G1	BR2440B200			
	30			40	Outdoor	G1R	BR3040B200R ④			
	40			40	Outdoor	L1R	BR4040B200R ④			
	225	225	42	42	Indoor	L2	#1-250 kcmil	BR4242B225		
			42	42	Outdoor	L2R		BR4242B225R ④		

#### Notes

- ① Combination style covers may be used in surface or flush applications.
- ② Wire range size for BR1020B100SP is #6-#1 Cu/Al.
- ③ Includes through-feed lugs for both phase and neutral conductors.
- ④ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 71**.
- ⑤ See copper bus offering, **Page 58**.
- ⑥ 22 kAIC series combination rating is obtained when Types BD, BR, BQ, BQC and GFCB 10 kAIC branch breakers are used in series with Type BRH main breaker.
- ⑦ 25 kAIC series combination rating is obtained when Types BD, BR, BQ, BQC and GFCB 10 kAIC branch circuit breakers are used in series with Type BWH main breaker.
- ⑧ Supplied with adapter plate to use DS Group1 hubs on **Page 71**. If 2.50-inch (63.5 mm) hub is needed, remove adapter and use ARP00007CH25 hub.
- ⑨ Neutral is bonded—suitable for service entrance only—cannot be converted for sub-feed application.

All main circuit breaker loadcenters are listed for use as service entrance equipment and are shipped with neutral bonding strap preattached. The maximum rating of the panel is the main circuit breaker rating when used as service entrance equipment. Ground bar kits priced separately. See **Page 71**.

# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

1

#### Main Circuit Breaker Loadcenters—10/22/25 kAIC

BR3030BC100



#### Main Circuit Breaker Loadcenters—With Copper Bus—Single-Phase Three-Wire—120/240 Vac—Factory-Bonded Split Neutral

Main Breaker Type	Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Loadcenter Catalog Number with Combination Cover ①②
		Spaces	Circuits				
BR 10 kAIC	100	20	20	Indoor	C2	#4-1/0	<b>BR2020BC100</b>
		30	30	Indoor	D1	#4-1/0	<b>BR3030BC100</b>
BRH 22 kAIC ③	100	30	30	Indoor	D1	#4-1/0	<b>BR3030HC100</b>
		30	30	Indoor	G1	#2-300 kcmil	<b>BR3030BC150</b>
BWH 25 kAIC	200	20	40	Indoor	D1	#2-300 kcmil	<b>BR2040BC200</b>
		30	40	Indoor	G1	#2-300 kcmil	<b>BR3040BC200</b>
		40	40	Indoor	L1	#2-300 kcmil	<b>BR4040BC200</b>

#### Main Circuit Breaker Loadcenters—10/22 kAIC

B4242DFN



#### Single-Phase Three-Wire—120/240 Vac—Insulated/Bondable Neutral

Main Breaker Type	Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Commercial Loadcenter Catalog Number ④⑤⑥	
		Spaces	Circuits				With Flush or NEMA Type 3R Cover	With Surface Cover
DK ⑦	300	42	42	Indoor	24	(2) #3/0-250 kcmil	<b>BR304242F</b>	<b>BR304242S</b>
		42	42	Indoor	24	(2) #3/0-250 kcmil	<b>B4242DFN</b>	<b>B4242DSN</b>
		42	42	Outdoor	47	(2) #3/0-250 kcmil	<b>B4242DR1N</b> ⑧	—
HLD ⑨	600	42	42	Indoor	24	(2) #3/0-500 kcmil	<b>B4242EFN</b>	<b>B4242ESN</b>

#### Notes

- ① All main circuit breaker loadcenters are listed for use as service entrance equipment and are shipped with neutral bonding strap preattached. The maximum rating of the panel is the main circuit breaker rating when used as service entrance equipment.
- ② Ground bar kits priced separately. See **Page 71**.
- ③ 22 kAIC series combination rating is obtained when Types BD, BR, BQ, BQC and GFBCB 10 kAIC branch breakers are used in series with Type BRH main breaker.
- ④ Ground bar kits priced separately. See **Page 71**.
- ⑤ The maximum rating of the panel is the main circuit breaker rating when used as service entrance equipment.
- ⑥ Door lock and key included with loadcenter.
- ⑦ Type DK main circuit breaker is rated 65 kAIC at 240 Vac and allows a 22 kAIC series rating on the panel when Types BR, BD and BJ branch circuit breakers are used.
- ⑧ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 71**.
- ⑨ Type HLD main circuit breaker is rated 65 kAIC at 240 Vac. Type HLD circuit breaker **is not** series rated with Types BR, BD and BJ branch circuit breakers.

Box sizes **Pages 85** through **88**.

### Single-Phase—Main Lug Loadcenters

#### Single-Phase Three-Wire—120/240 Vac—Insulated/Bondable Neutral

Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Trim Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Loadcenter Catalog Number	
	Spaces	Circuits						
70	Surface	Outdoor	Indoor	Surface (no door)	5	#8-#2	BR24L70SP ①②	
			Indoor	Surface (no door)	5		BR24L70SGP ②③	
	Outdoor	—	5R	BR24L70RP ①②④				
	Indoor	Flush (no door)	5	BR24L70FP ①②				
	Indoor	Flush (no door)	5	BR24L70FGP ②⑤				
	Indoor	Flush (no door)	5	BR24L70FDP ①②				
125	Flush	Outdoor	Outdoor	—	6R	#14-1/0	BR24L125SP ①②	
			Outdoor	—	6R		BR24L125RP ①②④	
			Outdoor	—	6R		BR24L125RSEP ②⑦⑧	
	Surface (No Door)	Indoor	Indoor	Indoor	Flush (no door)	6	#14-1/0	BR24L125FP ①②
				Indoor	Flush (no door)	6		BR24L125FDP ①②
				Indoor	Flush (no door)	6		BR24L125FSDP ①②⑥⑦
				Indoor	Flush (no door)	6		BR24L125FSDGP ②⑥⑦
				Indoor	Flush (no door)	6		BR24L125FSDFP ①②
				Indoor	Flush (no door)	6		BR24L125FSDFGP ②⑥⑦
				Indoor	Flush (no door)	6		BR24L125FSDFDGP ②⑥⑦⑩
				Indoor	Flush (no door)	6		BR24L125FSDFDSDP ②⑥⑦⑩
	Flush (No Door)	Indoor	Indoor	Indoor	Flush (with door)	7	#14-#1	BR48L125SP ①⑨
				Indoor	Flush (with door)	7		BR48L125SGP ③⑨
				Indoor	Flush (with door)	7		BR48L125RP ①④⑨
				Indoor	Flush (with door)	7		BR48L125FP ①⑨
				Indoor	Flush (with door)	7		BR48L125FDP ①⑨
				Indoor	Flush (with door)	7		BR48L125FSDP ①⑨
				Indoor	Flush (with door)	7		BR48L125FSDGP ③⑨
				Indoor	Flush (with door)	7		BR48L125FSDFP ①⑨
	Outdoor	Indoor	Indoor	Indoor	Flush (with door)	7	#14-#1	BR612L125SP ①⑩
Indoor				Flush (with door)	7	BR612L125SGP ⑩⑪		
Indoor				Flush (with door)	7	BR612L125SDP ①⑩		
Indoor				Flush (with door)	7	BR612L125SDGP ⑩⑪		
Indoor				Flush (with door)	7	BR612L125SDFP ①⑩		
Indoor				Flush (with door)	7	BR612L125SDFGP ⑤⑩⑪		
Indoor				Flush (with door)	7	BR612L125SDFDGP ⑤⑩⑪⑫		
Indoor				Flush (with door)	7	BR612L125SDFDSDP ⑤⑩⑪⑫		
Indoor				Flush (with door)	7	BR612L125SDFDSDGP ⑤⑩⑪⑫		
Indoor				Flush (with door)	7	BR612L125SDFDSDFP ⑤⑩⑪⑫		
Indoor				Flush (with door)	7	BR612L125SDFDSDFGP ⑤⑩⑪⑫⑬		
Indoor				Flush (with door)	7	BR612L125SDFDSDFDSDP ⑤⑩⑪⑫⑬		
Outdoor	Indoor	Indoor	Indoor	Flush (with door)	7	#14-#1	BR816L125SP ①⑩	
			Indoor	Flush (with door)	7		BR816L125SGP ⑩⑫	
			Indoor	Flush (with door)	7		BR816L125SDP ①⑩	
			Indoor	Flush (with door)	7		BR816L125SDGP ⑩⑫	
			Indoor	Flush (with door)	7		BR816L125SDFP ①⑩	
			Indoor	Flush (with door)	7		BR816L125SDFGP ⑤⑩⑫	
			Indoor	Flush (with door)	7		BR816L125SDFDGP ⑤⑩⑫⑬	
			Indoor	Flush (with door)	7		BR816L125SDFDSDP ⑤⑩⑫⑬	
			Indoor	Flush (with door)	7		BR816L125SDFDSDGP ⑤⑩⑫⑬	
			Indoor	Flush (with door)	7		BR816L125SDFDSDFP ⑤⑩⑫⑬	
			Indoor	Flush (with door)	7		BR816L125SDFDSDFGP ⑤⑩⑫⑬⑭	
			Indoor	Flush (with door)	7		BR816L125SDFDSDFDSDP ⑤⑩⑫⑬⑭	



#### Notes

- ① Ground bar kits priced separately. See **Page 71**.
  - For 2/4 circuit loadcenters, use GBK5 or GBK520 ground bar.
  - For 4/8, 6/12 and 8/16 circuit loadcenters, use GBK10 ground bar.
  - Ground bars mount to the left side wall of the enclosure for the 4/8, 6/12 and 8/16 circuit loadcenters.
- ② Suitable for use as service equipment when not more than two service disconnecting mains are provided or when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ③ Ground bar GBK5 is installed.
- ④ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 71**.
- ⑤ CSA and UL approved.
- ⑥ Neutral/ground holes (6) #14-6 and (3) #14-2/0 AWG Cu/Al.
- ⑦ For use as service entrance applications only.
- ⑧ Neutral/ground holes (6) #14-6 and (3) #14-1/0 AWG Cu/Al.
- ⑨ Suitable for use as service equipment when not more than two service disconnecting mains are provided or when not more than six service disconnecting mains are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ⑩ Suitable for use as service equipment when a main breaker is used or when not more than six service disconnecting mains are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ⑪ Ground bar GBK10 is installed.
- ⑫ Ground bar GBK14 is installed.

Box sizes **Pages 85** through **88**.

#### Single-Phase—Main Lug Loadcenters

#### Single-Phase Three-Wire—120/240 Vac—Insulated/Bondable Neutral, continued

Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Loadcenter Catalog Number with Combination or NEMA Type 3R Cover <sup>①</sup>	
	Spaces	Circuits					
BR1224L125 	125	12	12	Indoor	B1	#6–2/0 BR1212L125 <sup>②③④⑤</sup>	
		12	24	Indoor	B1	BR1224L125 <sup>②④⑤</sup>	
		12	24	Indoor	B1	BR1224L125G <sup>②④⑤</sup>	
		12	24	Indoor	B1	BR1224L125DG <sup>②④⑤⑥</sup>	
		12	24	Outdoor	B1R	BR1224L125R <sup>②⑤⑦</sup>	
		16	16	Indoor	B2	BR1616L125 <sup>②④⑤</sup>	
		16	24	Indoor	B2	BR1624L125 <sup>②④</sup>	
		16	24	Indoor	B2	BR1624L125G <sup>②④</sup>	
		16	24	Outdoor	B2R	BR1624L125R <sup>②⑦</sup>	
		20	20	Indoor	C1	BR2020L125 <sup>②④⑤</sup>	
		20	24	Indoor	C1	BR2024L125 <sup>②④</sup>	
		20	24	Indoor	C1	BR2024L125G <sup>②④⑤</sup>	
		20	24	Outdoor	C1R	BR2024L125R <sup>②⑦</sup>	
		24	24	Indoor	C2	BR2424L125 <sup>②④</sup>	
		24	24	Indoor	C2	BR2424L125G <sup>②④⑤</sup>	
		150	16	30	Indoor	C2	#1–300 kcmil BR1630L150 <sup>④⑥</sup>
			20	30	Indoor	C2	BR2030L150 <sup>④⑥</sup>
BR1224L200 	200	8	16	Outdoor	B2R	#1–300 kcmil BR816L200RF <sup>⑥⑦⑧</sup>	
		12	24	Indoor	B2	BR1224L200 <sup>④⑤⑥</sup>	
		12	24	Outdoor	B2R	BR1224L200R <sup>⑥⑦⑧</sup>	
		20	40	Indoor	C2	BR2040L200 <sup>④⑥</sup>	
		20	40	Indoor	C2	BR2040L200G <sup>④⑥⑧</sup>	
		20	40	Outdoor	C3R	BR2040L200R <sup>⑦⑧</sup>	
		24	40	Indoor	C4	BR2440L200 <sup>④⑥</sup>	
		30	40	Indoor	D1	BR3040L200 <sup>④⑥</sup>	
		30	40	Indoor	D1	BR3040L200G <sup>④⑥⑧</sup>	
		30	40	Outdoor	D1R	BR3040L200R <sup>⑦⑧</sup>	
		40	40	Indoor	G1	BR4040L200 <sup>④⑥</sup>	
		40	40	Indoor	G1	BR4040L200G <sup>④⑥</sup>	
		40	40	Outdoor	G1R	BR4040L200R <sup>⑦⑧</sup>	
		225	42	42	Indoor	L1	#1–300 kcmil BR4242L225 <sup>④</sup>
42	42		Outdoor	L1R	BR4242L225R <sup>⑦</sup>		

#### Notes

- ① Ground bar kits priced separately unless otherwise noted. See **Page 71**.
- ② Has notch for BREQS125 hold-down kit.
- ③ Single, movable neutral is provided.
- ④ Combination cover style.
- ⑤ Suitable for use as service equipment when not more than six main disconnecting means are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ⑥ Ground bars GBK5 and GBK520 installed.
- ⑦ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 71**.
- ⑧ Ground bar GBK1220 installed.
- ⑨ Has notch for BRHDK125 hold-down kit.
- ⑩ Includes through-feed lugs for both phase and neutral conductors.

### Single-Phase—Main Lug Loadcenters, Non-Metallic

2460SNM



#### Single-Phase Three-Wire—120/240 Vac—Insulated/Bondable Neutral

Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Trim Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Loadcenter Catalog Number
	Spaces	Circuits					
40 ①	②	②	Indoor	Flush (no door)	2	②	TT120FLGNM ②③
	②	②	Indoor	Surface (no door)	2		TT120SLGNM ②③
60	2	4	Indoor	Flush (no door)	2	#14–2	2460FNM
	2	4	Indoor	Surface (no door)	2		2460SNM
	2	4	Indoor	Flush (no door)	2		2460FGNM ③
	2	4	Indoor	Surface (no door)	2		2460SGNM ③
	2	4	Outdoor	—	④		2460RNM

BR816LC125FDP



#### Single-Phase Three-Wire—120/240 Vac—Single Neutral with Copper Bus

Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Trim Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Loadcenter Catalog Number
	Spaces	Circuits					
125	8	16	Indoor	Surface (with door)	7	#14–1	BR816LC125SDP
	8	16	Indoor	Flush (with door)	7		BR816LC125FDP

#### Notes

- ① Suitable for use as service equipment when not more than six main disconnecting means are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ② This device has no main lugs. A Type BR or BD breaker is required to be backed to supply power to branch breakers. This device is single-phase 120 Vac only. With the use of three Type BR breakers there are two branch circuits available. With the use of three Type BD breakers there are five branch circuits available.
- ③ Includes GB4NM ground bar.
- ④ 2460 RNM uses the non-metrical ACD enclosure. See **ACD Section** for dimensions.

Box sizes **Pages 85** through **88**.

# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

1

#### Single-Phase—Main Lug Loadcenters—400 and 600A

4242DFN



#### Single-Phase Three-Wire—120/240 Vac—Insulated/Bondable Neutral

Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Commercial Loadcenter Catalog Number <sup>①②③</sup>	
	Spaces	Circuits				With Flush or NEMA Type 3R Cover	With Surface Cover
400	12	24	Indoor	19	(1) #4/0–750 kcmil or (2) #3/0–400 kcmil	—	1224DSN <sup>④</sup>
	12	24	Outdoor	42		1224DR1N <sup>④⑤</sup>	—
	24	42	Indoor	20		—	2442DSN
	42	42	Indoor	22		4242DFN	4242DSN
	42	42	Outdoor	46		4242DR1N <sup>④</sup>	—
600	42	42	Indoor	22	(2) #2–500 kcmil	—	4242ESN

#### Three-Phase—Main Circuit Breaker Loadcenters—10 kAIC

3BR4242B200



#### Three-Phase Four-Wire—208Y/120 Vac or 240 Vac Insulated/Bondable Neutral

Main Breaker Type	Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Loadcenter Catalog Number <sup>⑥⑦</sup> (With Combination or NEMA Type 3R Cover)
		Spaces	Circuits				
BR 10 kAIC	100	12	24	Indoor	C1	#4–1/0	3BR1224B100
		12	24	Outdoor	C1R		3BR1224B100R <sup>⑧</sup>
CC 10 kAIC	150	30	42	Indoor	L1	#1–3/0	3BR3042B150
		30	42	Outdoor	L1R		3BR3042B150R <sup>⑧</sup>
	200	30	42	Indoor	L1	#1–250 kcmil	3BR3042B200
		30	42	Outdoor	L1R		3BR3042B200R <sup>⑧</sup>
		42	42	Indoor	L2		3BR4242B200
		42	42	Outdoor	L2R		3BR4242B200R <sup>⑧</sup>
225	42	42	Indoor	L2	#1–300 kcmil	3BR4242B225	
	42	42	Outdoor	L2R		3BR4242B225R <sup>⑧</sup>	

#### Notes

- ① Ground bar kits priced separately unless otherwise noted. See **Page 71**.
- ② Has notch for BRHDK125 hold-down kit.
- ③ Ground bar GBK8 installed.
- ④ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 71**.
- ⑤ Suitable for use as service equipment when not more than six main disconnecting means are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ⑥ All main circuit breaker loadcenters are listed for use as service entrance equipment and are shipped with a neutral bonding strap pre-attached (commercial loadcenters do not have a pre-attached bonding strip). The maximum main rating of the panel is the main circuit breaker rating when used as service entrance equipment.
- ⑦ Ground bar kits priced separately. See **Page 71**.
- ⑧ Rainproof loadcenters are furnished with hub closure plates. For rainproof hubs, refer to **Page 71**.

### Three-Phase—Main Circuit Breaker Loadcenters—22/65 kAIC

#### Three-Phase, Four-Wire—208Y/120 Vac or 240 Vac Insulated/Bondable Neutral

Main Breaker Type	Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Commercial Loadcenter Catalog Number <sup>①②③</sup>	
		Spaces	Circuits				With Combination or NEMA Type 3R Cover	
DK <sup>④</sup> 22 kAIC	400	42	42	Indoor	24	(2) #3/0–250 kcmil	3B4242DFN	
		42	42	Outdoor	47		3B4242DR1N <sup>⑤</sup>	
LD <sup>⑥</sup>	600	42	42	Indoor	24	(2) #3/0–500 kcmil	3B4242EFN	

### Three-Phase—High Interrupting Rated Main Circuit Breaker Loadcenters—22/100 kAIC

#### Three-Phase Four-Wire—208Y/120 Vac or 240 Vac Insulated/Bondable Neutral

3BR4242H200



Main Breaker Type	Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Loadcenter Catalog Number <sup>⑦⑧</sup>	
		Spaces	Poles				with Combination Cover	with Surface Cover
BRH 22 kAIC <sup>⑨</sup>	100	12	24	Indoor	C1	#4–1/0	3BR1224H100	3BR1224H100S
CHH 100 kAIC <sup>⑩</sup>	150	30	42	Indoor	L1	#1–250 kcmil	3BR3042H150	3BR3042H150S
CHH 200 kAIC <sup>⑩</sup>	200	30	42	Indoor	L1	#1–250 kcmil	3BR3042H200	3BR3042H200S
		42	42	Indoor	L2		3BR4242H200	3BR4242H200S

#### Notes

- ① All main circuit breaker loadcenters are listed for use as service entrance equipment and are shipped with a neutral bonding strap pre-attached (commercial loadcenters do not have a pre-attached bonding strip). The maximum main rating of the panel is the main circuit breaker rating when used as service entrance equipment.
- ② Ground bar kits priced separately. See **Page 71**.
- ③ Door lock and key included with loadcenter.
- ④ Type DK main circuit breaker is rated 65 kAIC at 240 Vac and allows a 22 kAIC series rating on the loadcenter when Types BR, BD and BJ branch circuit breakers are used.
- ⑤ Rainproof loadcenters are furnished with hub closure plates. For rainproof hubs, refer to **Page 71**.
- ⑥ The LD main circuit breaker is rated 65 kAIC at 240 Vac. Type LD circuit breaker **is not** series rated with Types BR, BD and BJ branch circuit breakers.
- ⑦ All main circuit breaker loadcenters are listed for use as service entrance equipment and are shipped with a neutral bonding strap pre-attached.
- ⑧ Ground bar kits priced separately.
- ⑨ 22 kAIC series combination rating is obtained when Types BD, BR, BQ, BQC and GFGB branch breakers are used with BRH main.
- ⑩ 100 kAIC series combination rating is obtained when Types BD, BR, BQ, BQC and GFGB branch breakers are used with CHH main.

Box sizes **Pages 85** through **88**.

# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

1

#### Three-Phase—Main Lug Loadcenters

3BR1224L125



#### Three-Phase Four-Wire—208Y/120 Vac or 240 Vac Insulated/Bondable Neutral

Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Loadcenter Catalog Number <sup>①</sup> (With Combination or NEMA Type 3R Cover)		
	Spaces	Circuits						
100	3	3	Indoor	9	#14–1/0	3BR3L100S <sup>②</sup>		
	3	3	Outdoor	9R		3BR3L100R <sup>③</sup>		
125	12	24	Indoor	C1	#6–2/0	3BR1224L125 <sup>④⑤</sup>		
	12	24	Outdoor	C1R		3BR1224L125R <sup>③④⑤</sup>		
150	24	42	Indoor	D1	#1–300 kcmil	3BR2442L150		
	24	42	Outdoor	D1R		3BR2442L150R <sup>③</sup>		
200	12	24	Indoor	C4	#1–300 kcmil	3BR1224L200 <sup>⑥</sup>		
	12	24	Outdoor	C3R		3BR1224L200R <sup>③⑥</sup>		
	30	42	Indoor	G1		3BR3042L200		
	30	42	Outdoor	G1R		3BR3042L200R <sup>③</sup>		
	42	42	Indoor	L1		3BR4242L200		
	42	42	Outdoor	L1R		3BR4242L200R <sup>③</sup>		
	225	42	42	Indoor		L1	#1–300 kcmil	3BR4242L225
	42	42	Outdoor	L1R		3BR4242L225R <sup>③</sup>		

34242DFN



#### Three-Phase, Four-Wire—208Y/120 Vac or 240 Vac Insulated/Bondable Neutral

Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Commercial Loadcenter Catalog Number <sup>⑥</sup>	
	Spaces	Circuits				With Flush or NEMA Type 3R Cover	With Surface Cover
400	18	36	Indoor	19	(1) 250–750 kcmil or (2) #3/0–250 kcmil	—	—
	18	36	Outdoor	43		—	—
	24	42	Indoor	19		—	—
	42	42	Indoor	22		34242DFN	34242DSN
	42	42	Outdoor	46		34242DR1N <sup>③</sup>	—
600	42	42	Indoor	22	(2) #2–500 kcmil	—	34242ESN

#### Notes

- ① Ground bar kits priced separately. See **Page 71**.
- ② Surface cover only.
- ③ Rainproof loadcenters are furnished with hub closure plates. For rainproof hubs, refer to **Page 71**.
- ④ Has notch for BREQS125 hold-down kit.
- ⑤ Suitable for use as service equipment when not more than six main disconnecting means are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ⑥ Door lock and key included with loadcenter.

Box sizes **Pages 85** through **88**.



**Convertible Loadcenters MCB or MLO—Base Units and Main Devices 10/22/25 kAIC, Complete Assembly Consists of: Loadcenter and Either Main Breaker Kit or Main Lug Kit**

**Note:** Interrupting rating depends on main circuit breaker selected.

BR3040N200



**Base Units—Single-Phase Three-Wire—120/240 Vac—Insulated/Bondable Neutral**

Main Ampere Rating ①	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main	Loadcenter Catalog Number With Combination or NEMA Type 3R Cover ②③
	Spaces	Circuits				
125 ④	12	24	Indoor	B2	See main breaker and main lug kit tables Page 59.	BR1224N125 ⑤⑥
	12	24	Outdoor	B2R		BR1224N125R ⑤⑥⑦
	16	24	Indoor	C1		BR1624N125 ⑤
	16	24	Outdoor	C1R		BR1624N125R ⑤⑦
	20	24	Indoor	C2		BR2024N125 ⑤
	20	24	Outdoor	C3R		BR2024N125R ⑤⑦
200 ⑧	8	16	Outdoor	C3R	BR816N200RF ⑦⑨⑩	
	12	24	Indoor	C4	BR1224N200 ⑩	
	12	24	Outdoor	C3R	BR1224N200R ⑦⑩	
	16	32	Indoor	C4	BR1632N200 ⑩	
	20	40	Indoor	D1	BR2040N200 ⑩	
	20	40	Indoor	D1	BR2040N200G ⑩	
	20	40	Outdoor	D1R	BR2040N200R ⑦⑩	
	20	40	Outdoor	D1R	BR2040N200RG ⑩	
	24	40	Indoor	G1	BR2440N200 ⑦⑩	
	30	40	Indoor	G1	BR3040N200 ⑩	
	30	40	Indoor	G1	BR3040N200G ⑩	
	30	40	Outdoor	G1R	BR3040N200R ⑦⑩	
	30	40	Outdoor	G1R	BR3040N200RG ⑩	
	40	40	Indoor	L1	BR4040N200 ⑩	
	40	40	Indoor	L1	BR4040N200G ⑩	
40	40	Outdoor	L1R	BR4040N200R ⑦⑩		
40	40	Outdoor	L1R	BR4040N200RG ⑩		

**Notes**

- ① The maximum rating of the loadcenter is the main circuit breaker rating when used as service entrance equipment.
- ② 100, 125 and 200A convertible base unit catalog numbers include interior, box and cover only. Main devices and accessories must be ordered separately for field installation. All convertible base units are listed as suitable for use as service entrance equipment when used per Article 384 of the NEC.
- ③ Ground bar kits priced separately except as noted, refer to **Page 71**.
- ④ For main breaker, use Type BR. For main lug use Type BRSF.
- ⑤ BREQS125 hold-down screw comes with loadcenter for back-fed Types BR and BRH main circuit breakers.
- ⑥ Convertible to maximum of 100A main circuit breaker and 125A main lug.
- ⑦ Rainproof loadcenters are furnished with hub closure plates. For rainproof hubs, refer to **Page 71**.
- ⑧ For main breaker, use Type BW or BWH. For main lug, use Type BRL.
- ⑨ Includes through-feed lugs for both phase and neutral conductors.
- ⑩ No hold-down provisions for back-fed Types BR and BRH main circuit breakers.
- ⑪ Includes GBK2120 ground bar.

# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

1

3BR3030N100



#### Base Units—Three-Phase Four-Wire—208Y/120 Vac or 240 Vac Insulated/Bondable Neutral

Main Ampere Rating <sup>①</sup>	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main	Loadcenter Catalog Number <sup>②③</sup> (With Combination or NEMA Type 3R Cover)
	Spaces	Circuits				
100 <sup>④</sup>	30	30	Indoor	D1	See main breaker and main lug kit tables next page.	3BR3030N100 <sup>⑤</sup>
	30	30	Outdoor	D1R		3BR3030N100R <sup>⑤⑥</sup>
125 <sup>④</sup>	12	24	Indoor	C1		3BR1224N125 <sup>⑤⑥⑦</sup>
	12	24	Outdoor	C1R		3BR1224N125R <sup>⑤⑥⑦⑧</sup>

#### Convertible Loadcenters—With Copper Bus 10/22/25 kAIC

BR3040NC200



#### Convertible—Single-Phase Three-Wire—120/240 Vac—Insulated/Bondable Neutral

Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main	Loadcenter Catalog Number with Combination or NEMA Type 3R Cover <sup>②③⑨</sup>
	Spaces	Circuits				
125 10/22 kAIC <sup>⑩⑪</sup>	12	24	Indoor	B2	See main breaker and main lug kit tables on Page 59.	BR1224NC125 <sup>⑥⑫</sup>
	12	24	Outdoor	B2R		BR1224NC125R <sup>④⑥⑫</sup>
	20	24	Indoor	C2		BR2024NC125 <sup>⑬</sup>
	20	24	Outdoor	C3R		BR2024NC125R <sup>④⑬</sup>
200 10/25 kAIC <sup>⑩⑪</sup>	20	40	Indoor	D1		BR2040NC200
	20	40	Outdoor	D1R		BR2040NC200R <sup>⑭</sup>
	30	40	Indoor	G1		BR3040NC200
	30	40	Outdoor	G1R		BR3040NC200R <sup>⑭</sup>
	40	40	Indoor	L1		BR4040NC200
	40	40	Outdoor	L1R		BR4040NC200R <sup>⑭</sup>

#### Notes

- ① The maximum rating of the loadcenter is the main circuit breaker rating when used as service entrance equipment.
- ② 100, 125 and 200A convertible base unit catalog numbers include interior, box and cover only. Main devices and accessories must be ordered separately for field installation. All convertible base units are listed as suitable for use as service entrance equipment when used per Article 384 of the NEC.
- ③ Ground bar kits priced separately, refer to **Page 71**.
- ④ For main breaker, use Type BR. For main lug, use Type BRSF.
- ⑤ BREQS125 hold-down screw comes with loadcenter for back-fed Types BR and BRH main circuit breakers.
- ⑥ Rainproof loadcenters are furnished with hub closure plates. For rainproof hubs, refer to **Page 71**.
- ⑦ Convertible to maximum of 100A main circuit breaker and 125A main lug.
- ⑧ Suitable for use as service equipment when not more than six main disconnecting means are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).
- ⑨ All main circuit breaker loadcenters are listed for use as service entrance equipment and are shipped with a neutral bonding strap preattached. The maximum main rating of the loadcenter is the main breaker rating when used as service entrance equipment.
- ⑩ Interrupting rating depends on main circuit breaker selected. See **Page 71** for mains.
- ⑪ For main breaker, use Type BW or BWH. For main lug, use Type BRL.
- ⑫ Hold-down screw BREQS125 comes with loadcenter for back-fed Types BR and BRH main circuit breakers.

**Convertible Loadcenters MCB or MLO—Base Units and Main Devices 10/22/25 kAIC, Complete Assembly Consists of: Loadcenter and Either Main Breaker Kit or Main Lug Kit**

**Note:** Interrupting rating depends on main circuit breaker selected.

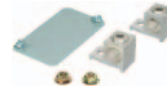
**BW2200**



**Main Devices—Two- and Three-Pole Main Circuit Breakers—120/240 Vac or 208Y/120 Vac or 240 Vac**

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	10 kAIC Catalog Number	22/25 kAIC Catalog Number ①
<b>Two-Pole</b>			
100	#4-1/0	BR2100	BRH2100
110	#4-1/0	BR2110	BRH2110
125	#4-2/0	BR2125	BRH2125
125	#2-300 kcmil	BW2125	BWH2125
150	#2-300 kcmil	BW2150	BWH2150
175	#2-300 kcmil	BW2175	BWH2175
200	#2-300 kcmil	BW2200	BWH2200
<b>Three-Pole</b>			
100	#1	BR3100	BRH3100

**BRL200**



**Main Devices—Two- and Three-Pole Main Lug Kits—120/240 Vac or 208Y/120 Vac or 240 Vac**

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Catalog Number
<b>Two-Pole</b>		
125	#6-2/0	BRSF125
150	#1-300 kcmil	BRL200
175	#1-300 kcmil	BRL200
200	#1-300 kcmil	BRL200
<b>Three-Pole</b>		
150	#6-3/0	3BRSF150

**Main Circuit Breaker with Accessory**

Example: BW22005R01 (Put description with catalog number on order. See **Page 83**.)

### Spa Panels

**Spa Panel—Meets NEC Article 680.40 Through 680.43—Requirements for GFCI Protection**

Main Ampere Rating	Maximum Number 1-Inch (25.4 mm) Space	Poles	Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Catalog Number
40	—	—	Outdoor	5R	#8-#2	BR40SPA ②
50	—	—	Outdoor	5R	#8-#2	BR50SPA ③

**Notes**

- ① Series combination rating with Types BD, BR, BQ, BOC and GFCB is 22 kAIC with BRH main and 25 kAIC with BWH main.
- ② Includes a GFCB240 breaker, factory installed.
- ③ Includes a GFCB250 breaker, factory installed.

#### Single-Phase and Three-Phase Circuit Breaker Unit Enclosures—10/25 kAIC

##### Circuit Breaker Unit Enclosures



#### Type ECB Circuit Breaker Unit Enclosure—Order Type BW and BWH Circuit Breaker Separately—Unit Enclosure Includes Lug Tree Kit

Main Ampere Rating	Unit Enclosure Type	Mounting Type	Circuit Breaker Type	Wire Size Range Cu/Al 60°C or 75°C	Catalog Number
<b>Single-Phase Three-Wire—240 Vac Maximum</b>					
225	Indoor	Flush	BW, BWH	①	ECB225F ②③④
225	Indoor	Surface	BW, BWH	①	ECB225S ②③④
225	Outdoor	—	BW, BWH	①	ECB225R ②③④⑤

##### BWH2200



#### Types BW and BWH Circuit Breakers 120/240 Vac—25 kAIC for Use in Type ECB Unit Enclosures

Ampere Rating	Two-Pole Breakers 10 kAIC	Wire Size Range Cu/Al 60°C or 75°C for Line Terminals	Two-Pole Breakers 25 kAIC
125	BW2125	#2–300 kcmil	BWH2125
150	BW2150		BWH2150
175	BW2175		BWH2175
200	BW2200		BWH2200
225	BW2225		BWH2225

#### BW/BWH Lug Tree Kit for Replacement Purposes Only for Use in Type ECB Unit Enclosures

Ampere Rating	Description	Wire Size Range Cu/Al 60°C or 75°C for Line Terminals	Catalog Number
225	For use on 125, 150, 175, 200 and 225A BW and BWH breakers	#2–300 kcmil	MCBK225

#### Wire/Application Chart

Wire/Application	Maximum Wire Size	Maximum Ampere Rating
Aluminum—standard	250 kcmil	200
Aluminum—service entrance	250 kcmil	225
Copper—standard and service entrance	250 kcmil	225

##### Notes

- ① Wire size is determined by the circuit breaker installed in enclosure. Maximum wire size and ampere rating is determined by Wire/Application Chart.
- ② Order circuit breaker separately.
- ③ One ground lug accepting (1) #14–#2 is factory installed. Also, there are pre-drilled holes to accept a GBK5 ground bar.
- ④ Approved for service entrance.
- ⑤ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page 71**.
- ⑥ Add suffix indicated to end of breaker catalog number.

Box sizes **Pages 85** through **88**.

#### Shunt Trips, Auxiliary and Alarm Contacts

Description	Catalog Number Suffix Adder ⑥
<b>Shunt Trip for Types BW/BWH</b>	
12V	SR12
24V	SR24
120V	SR01
<b>Auxiliary Contact for Types BW/BWH</b>	
1NO and 1NC	AL1
2NO and 2NC	AL2
<b>Alarm Contacts for Types BW/BWH</b>	
Types BW/BWH	CR1
<b>Alarm Contacts for Type GFCB (Single-Pole)</b>	
Alarm contact for GFCB (single-pole)	W1
1NO and 1NC	W2

### Single-Phase and Three-Phase Circuit Breaker Unit Enclosures—10/25 kAIC

#### Type ECC Circuit Breaker Unit Enclosure—Order Type CC Circuit Breaker Separately

Main Ampere Rating	Unit Enclosure Type	Mounting Type	Circuit Breaker Type	Wire Size Range Cu/Al 60°C or 75°C	Catalog Number
<b>Single- and Three-Phase—240 Vac Maximum</b>					
225	Indoor	Flush	CC/CCV	⑤	<b>ECC225F</b> ①②③
225	Indoor	Surface	CC/CCV	⑤	<b>ECC225S</b> ①②③
225	Outdoor	—	CC/CCV	⑤	<b>ECC225R</b> ①②③④

CCV2200



#### Type CC and CCV Circuit Breaker 240 Vac—10 kAIC for Use in Type ECC Unit Enclosures

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C for Line Terminals	Type CCV and CC 10 kAIC Catalog Number
<b>Two-Pole</b>		
100	#4–4/0	<b>CCV2100</b>
125		<b>CCV2125</b>
150		<b>CCV2150</b>
175	#2/0–300 kcmil	<b>CCV2175</b>
200		<b>CCV2200</b>
225		<b>CCV2225</b>
<b>Three-Pole</b>		
100	#4–4/0	<b>CC3100</b>
125		<b>CC3125</b>
150		<b>CC3150</b>
175	#2/0–300 kcmil	<b>CC3175</b>
200		<b>CC3200</b>
225		<b>CC3225</b>

#### Wire/Application Chart

Wire/Application	Maximum Wire Size	Maximum Ampere Rating
Aluminum—standard	250 kcmil	200
Aluminum—service entrance	250 kcmil	225
Copper—standard and service entrance	250 kcmil	225

#### Notes

- ① Order circuit breaker separately.
- ② One ground lug accepting (1) #14–#2 is factory installed. Also, there are pre-drilled holes to accept a GBK5 ground bar.
- ③ Approved for service entrance.
- ④ Rainproof panels are furnished with hub closures plates. For rainproof hubs, refer to **Page 71**.
- ⑤ Wire size is determined by the circuit breaker installed in enclosure. Maximum wire size and ampere rating is determined by the Wire/Application Chart.
- ⑥ CCV breakers are two-pole only.
- ⑦ Add suffix indicated to end of breaker catalog number.

Box sizes **Pages 85** through **88**.

#### Shunt Trips and Auxiliary Contacts ⑥

Description Type	Volts	Catalog Number Suffix Adder ⑦
<b>Shunt Trip</b>		
CC	12 DC	<b>SR12</b>
CC	24 DC	<b>SR24</b>
CC	120 AC	<b>SR01</b>
CC	208 AC	<b>SR08</b>
CC	240 AC	<b>SR02</b>
CCV	48–127 AC/48–60 DC	<b>SR01</b>
CCV	9–24 AC/12–24 DC	<b>SR24</b>
<b>Auxiliary Contact</b>		
CC 1NO and 1NC	—	<b>AL1</b>

# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

#### 1 Commercial Loadcenters—Indoor Enclosures Main Circuit Breaker, Main Lug and Convertible, New York City Approved Single-Phase and Three-Phase

BR4242B200NY  
With 3BR42FTNY  
Cover Installed



#### Single-Phase Main Circuit Breaker—Factory Installed

Main Breaker Type	Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Loadcenter Catalog Number	Loadcenter Cover Catalog Number	
		Spaces	Circuits					Flush	Surface
<b>Single-Phase Three-Wire—120/240 Vac Insulated/Bondable Neutral</b>									
CC 10 kAIC	200	42	42	Indoor	A	#1–300 kcmil	BR4242B200NY ①	3BR42FTNY	3BR42STNY

BR4242L225NY  
With 3BR42FTNY  
Cover Installed



#### Single-Phase Main Lugs—Factory Installed

Main Lug Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Loadcenter Catalog Number	Loadcenter Cover Catalog Number	
	Spaces	Circuits					Flush	Surface
<b>Single-Phase Three-Wire—120/240 Vac Insulated/Bondable Neutral</b>								
225	42	42	Indoor	A	#1–300 kcmil	BR4242L225NY ①	3BR42FTNY	3BR42STNY

3BR4242N225NY



#### Three-Phase Convertible Loadcenters

Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Breaker	Loadcenter Catalog Number	Loadcenter Cover Catalog Number	
	Spaces	Circuits					Flush	Surface
<b>Three-Phase Four-Wire—120/240 Vac Insulated/Bondable Neutral</b>								
225	42	42	Indoor	B	#1–300 kcmil	3BR4242N225NY ①	3BR42FTNY	3BR42STNY

#### Three-Phase Main Breaker Kits

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Main Breaker Kit 10 kAIC
150	#4–4/0	CC3150N
175	#2/0–300 kcmil	CC3175N
200		CC3200N
225		CC3225N

#### Three-Phase Main Lugs Kit

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Main Lugs Kit
225	#2/0–300 kcmil	3BRL225

#### Note

① Approved for 150A and up for residential services in New York City.

**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.
  2. UL 50—Standards for Cabinets and Boxes.
  3. UL 489—Standards for Molded Case Circuit Breakers.
  4. UL 869—Standards for Service Equipment.
  5. Federal Specification W-C 375B—Circuit Breakers.
  6. 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 125A frame. Circuit breakers 15 through 125A 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. Bus bars 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.

- G. Branch circuit breakers may also be used in the 1/2-inch (12.7 mm) per pole ratings that include two-pole 1-inch (25.4 mm) wide modules and four-pole 2-inch (50.8 mm) wide modules. Two-pole circuit breakers must incorporate a common trip mechanism. The exclusive CTL rejection tab feature shall be provided to limit the number of branch devices for a loadcenter to 42, in compliance with NEC Article 384-15.
- H. Circuit breakers shall be completely enclosed in a molded case of thermoset material. No internal aluminum parts shall be used. All internal ferrous parts shall be plated to prevent corrosion.
- I. All terminals shall be listed for use with copper or aluminum conductors. Terminals shall be of the box lug or clamp type design. The terminals shall meet UL 486B requirements and shall be suitable for use with either 60°C or 75°C wire.
- J. The calibrated bimetal assembly shall be mechanically isolated from the load terminal using a flexible braided copper shunt wire, such that movement of the terminals due to twisting and overtorquing does not affect breaker calibration.
- K. Breakers shall be SWD rated and/or HACR rated as required.
- L. Arc Fault Interrupting circuit breakers, (AFI), shall be provided on all 15 and 20A single-phase 120/240 Vac circuits except those indicated as remote controlled breakers. AFI breakers shall be "Classified for mitigating the effects of arcing faults," or conforming to UL Standard 1699 and as defined by Article 210-12 Section A of the 1999 NEC Code.
- C. The deadfront shall have an easy adjustment feature for flush applications.
- D. Boxes shall be factory assembled into a single rigid structure.
- E. Unless otherwise noted on drawings, hinged doors covering all circuit breaker handles shall be included in all trims. Trim doors shall not uncover any live parts in making the circuit breaker handles accessible. If key locks are required, all locks shall be keyed alike.
- F. Combination trims for flush and surface panels shall be flat and shall overlap the box by at least 5/8-inch (15.9 mm) all around. Trims shall be mounted by a screwdriver without the need for special tools.

#### Surge Protection Devices

See Section 4 of the Distribution Products Catalog for complete details on surge protection.

#### Enclosures

- A. Loadcenter shall have NEMA Type 1 general purpose or NEMA Type 3R rainproof enclosures as indicated on the drawings and shall be surface or combination flush/surface mounted except where noted.
- B. Boxes shall be made from galvanized sheet steel having multiple knockouts. Rainproof boxes shall use galvanized steel or an approved coating system which meets or exceeds standards for outdoor NEMA Type 3R enclosures. Boxes shall be of sufficient size to provide at least a minimum code gutter space on all sides.

#### Finish

- A. Trims shall be bonderized and finished with a light gray ANSI-61 enamel. The paint finish shall be of a type to which field applied paint will adhere.

#### Factory Testing

- A. The standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest version of UL and NEMA.



Riser Panel



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## Riser Panel

### Product Description

Eaton's Riser Panel is a loadcenter with an offset interior to allow riser cables to pass through the enlarged gutter. By using lay-in tap lugs, the contractor is able to simply strip off a length of the riser cable's insulation, and tap off to the riser panel's main lugs. These panels are used in the construction of assisted living homes, dormitories, public housing complexes and apartments.

Eaton offers three 125A and one 200A main lug riser panels, a 12/24 and a 20/24, 20/30 and 30/40. The panels are convertible to main breaker by adding the appropriate breaker and a BREQS125 hold-down kit. Additionally, the 12/24 is offered in a bulk-packed version. The bulk-packed product must be ordered in multiples of 16, and consists of a pallet with uncartoned loadcenters on the bottom, and cartoned trims on top. The entire pallet is shrink-wrapped for protection. By supplying the loadcenter without a carton, the contractor is able to save the unpacking time as well as saving on the scrap cardboard on the site.

For applications higher than 125A, or the circuits provided by the panels above, we offer the BRGUTTER. This is essentially a junction box that mounts next to, and assembles to standard BR or CH loadcenters. There is a matching concentric knockout that allows the tapped cables to pass through from the BRGUTTER to the loadcenter. The trims of the loadcenter and the BRGUTTER are designed to allow the two boxes to bolt to one another in a flush application. There is no need to allow for the trim overhang.

Also offered is the GTAP250, which is a set of three lay-in, insulated tap lugs. The maximum wire size for the GTAP250 is 250 kcmil. GTAP250 can be used with either the riser panels or the BRGUTTER.

# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

#### 1

#### Product Selection

BR1224L125RIS

#### Riser Panel



Main Ampere Rating	Maximum Number 1-Inch (25.4 mm)		Enclosure Type	Box Size	Wire Size Range Cu/Al 60°C or 75°C for Main Lugs	Catalog Number
	Space	Circuits				
125	12	24	Indoor	C4	#6–2/0	BR1224L125RIS
125	12	24	Indoor	C4	#6–2/0	BR1224L125RISBP ①
125	20	24	Indoor	C4	#6–2/0	BR2024L125RIS
125	20	24	Indoor	C4	#6–2/0	BR2024L125RISBP ①
125	20	30	Indoor	C2	#6–2/0	BR2030L125RIS
200	30	40	Indoor	D1	#1–300	BR3040L200RIS

#### Accessories

For riser panels not shown, contact the Flex Center at 1-800-330-6479 for both CH and BR riser panels.

BRGUTTER (Shown with Loadcenter)



#### Riser Panel Accessories

Catalog Number

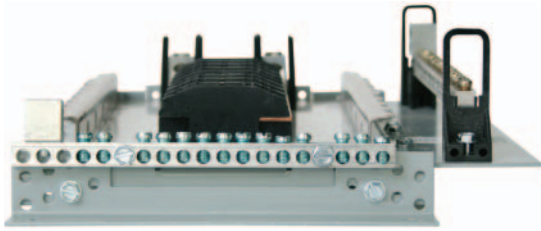
BRGUTTER ②

GTAP250

#### Notes

- ① Bulk-packaged loadcenter without carton. Must be ordered in multiples of 16.
- ② Refer to **Page 85** for dimensions. BRGUTTER is box size C2.

BRRETRO



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## Type BR Retrofit Interior Kits

### Product Description

Replacing existing loadcenters and panelboards can be a time consuming and expensive job. BR retrofit kits can be the solution to save time and money. The kit consists of a standard trim to fit the interior, a picture frame trim to fit the existing box, and a field adjustable interior assembly that includes neutral and ground bars as well. These are especially applicable when the existing box is flush mounted in drywall, plaster or block wall. The existing box, and many times existing wiring, can remain. Interiors are UL recognized under UL 67, Panelboard standard.

### Features

#### Detailed Product Guide

All standard retrofit kits are suitable for a range of existing box sizes:

- Box width ranging from 14.50 to 22.00 inches (368.3 to 558.8 mm)
- Box depth ranging from 4.00 inches (101.6 mm) for BR
- Box height ranging from 21.00 to 45.00 inches (533.4 to 1143.0 mm)

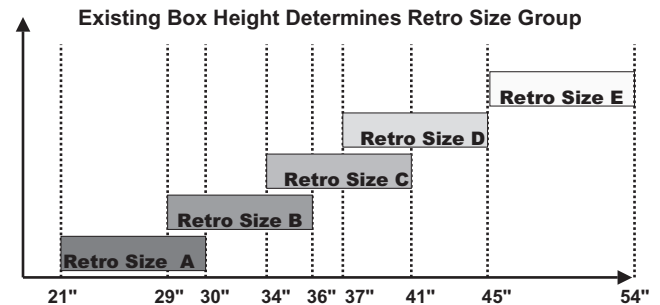
For box dimensions outside of these ranges, contact the Lincoln Flex Center at 800-330-6479. Be sure to provide the existing incoming line wire size.

### Product Selection

To select the retrofit kit:

1. From the existing box size determine which retrofit groups are suitable (may be more than one).
2. Use type of interior, number of phases, and type of main to find the selection chart.
3. Select part number from chart (if main breaker, replace XXX with specific amp rating).
4. Note that the overlap of the existing wall is the retro cover size minus the existing box size. If specific measurements are needed, communicate that you need a custom trim size.
5. Contact the Lincoln Flex Center at 800-330-6479 for pricing, lead-times, and order entry instructions.

### Retro Size Groups



#### Quick-Pro<sup>SM</sup>

All you need to know to save time and make more money.

Specified on certain Eaton products, the Quick-Pro symbol allows for immediate recognition of products that are designed for straightforward installation. When you see Quick-Pro, you know you can install quickly—sometimes up to 50% less than the usual installation time—and move onto your next job.

#### 1

#### Dimensions

Approximate Dimensions in Inches (mm)

#### Type BR Interior—With Main Breaker

Main Breaker Rating Amperes	kAIC	Existing Box Height		Wire Size	Number of Circuits	Part Number	Retro Size Group	Retro Cover Size ①	
		Minimum	Maximum					Height	Width
<b>Single-Phase</b>									
60–125	10	21.00 (533.4)	30.00 (762.0)	#4–2/0	20	RABR20BXXX ②	A	33.00 (838.2)	24.00 (609.6)
	22			#4–2/0		RABR20HXXX ②			
60–125	10	29.00 (736.6)	36.00 (914.4)	#4–1/0	30	RBBR30BCXXX ②	B	40.00 (1016.0)	24.00 (609.6)
	22			#4–1/0		RBBR30HCXXX ②			
100–200	25	29.00 (736.6) 31.00 (787.4)	30.50 (774.7) 36.00 (914.4)	#2–250 kcmil #2–300 kcmil	20	RBBR20HXXX ②			
100–225	25	34.00 (863.6) 36.00 (914.4)	35.50 (901.7) 41.00 (1041.4)	#2–250 kcmil #2–300 kcmil	30	RCBR30HXXX ②	C	43.00 (1092.2)	24.00 (609.6)
100–225	25	37.00 (939.8) 39.00 (990.6) 41.00 (1041.4)	38.50 (977.9) 40.50 (1028.7) 45.00 (1143.0)	#2–4/0 #2–250 kcmil #2–300 kcmil	40	RDBR40HXXX ②	D	47.00 (1193.8)	24.00 (609.6)
<b>Three-Phase</b>									
60–100	10	21.00 (533.4)	30.00 (762.0)	#4–2/0	12	RABR12B3XXX ②	A	33.00 (838.2)	24.00 (609.6)
	22			#4–2/0		RABR12H3XXX ②			
60–100	10	29.00 (736.6)	36.00 (914.4)	#4–1/0	30	RBBR30B3XXX ②	B	40.00 (1016.0)	24.00 (609.6)
	22			#4–1/0		RBBR30H3XXX ②			
100–200	10	37.00 (939.8)	45.00 (1143.0)	2/0–300 kcmil	30	RDBR30B3XXX ②			
	100	37.00 (939.8) 39.00 (990.6)	38.50 (977.9) 45.00 (1143.0)	2/0–250 kcmil 2/0–300 kcmil		RDBR30H3XXX ②			
100–225	10	34.00 (863.6)	35.50 (901.7)	2/0–250 kcmil	42	REBR42B3XXX ②	E	56.00 (1422.4)	24.00 (609.6)
	100	36.00 (914.4)	41.00 (1041.4)	2/0–300 kcmil		REBR42H3XXX ②			

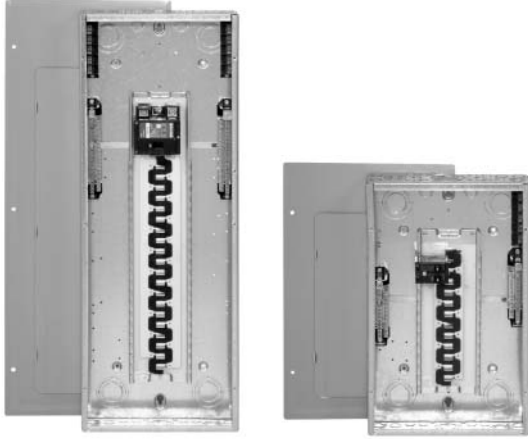
#### Type BR Interior—Main Lug Only

Maximum Bus Ampere Rating	Existing Box Height		Wire Size	Number of Circuits	Part Number	Retro Size Group	Retro Cover Size ①	
	Minimum	Maximum					Height	Width
<b>Single-Phase</b>								
125	21.00 (533.4)	30.00 (762.0)	#14–2/0	24	RABR20L125	A	33.00 (838.2)	24.00 (609.6)
200	29.00 (736.6)	31.50 (800.1)	#1–250 kcmil	30	RBBR30L200	B	40.00 (1016.0)	24.00 (609.6)
	32.00 (812.9)	36.00 (914.4)	#1–300 kcmil					
200	34.00 (863.6)	36.50 (927.1)	#1–250 kcmil	40	RCBR40L200	B	43.00 (1092.2)	24.00 (609.6)
	37.00 (939.8)	41.00 (1041.4)	#1–300 kcmil					
200	37.00 (939.8)	38.50 (977.9)	#1–250 kcmil	42	RDBR42L225	B	47.00 (1193.8)	24.00 (609.6)
	39.00 (990.6)	45.00 (1143.0)	#1–300 kcmil					
<b>Three-Phase</b>								
125	21.00 (533.4)	30.00 (762.0)	#8–2/0	24	RABR12L3125	A	33.00 (838.2)	24.00 (609.6)
100	29.00 (736.6)	36.00 (914.4)	#8–2/0	24	RBBR30L3100	B	40.00 (1016.0)	24.00 (609.6)
150	29.00 (736.6)	36.00 (914.4)	#4–4/0	24	RBBR24L3150			
200	34.00 (863.6)	35.50 (901.7)	#4–250 kcmil	30	RCBR30L3200	C	43.00 (1092.2)	24.00 (609.6)
	36.00 (914.4)	41.00 (1041.4)	#4–300 kcmil					
225	37.00 (939.8)	38.50 (977.9)	#4–250 kcmil	42	RDBR42L3225	D	47.00 (1193.8)	24.00 (609.6)
	39.00 (990.6)	45.00 (1143.0)	#4–300 kcmil					
225	45.00 (1143.0)	54.00 (1371.6)	#4–300 kcmil	42	REBR42L3225	E	56.00 (1422.4)	24.00 (609.6)

#### Notes

- ① Specific cover sizes are available. Be sure to specify the custom cover option and provide exact dimensions required.
- ② XXX is for Main Breaker specific ampere rating.

### BR Renovation Loadcenters



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### Type BR Renovation Loadcenters

#### Product Description

- Available in 10, 20, 30 and 40 circuit main breaker styles
- Designed to replace existing loadcenters and fuse boxes
- Type BR loadcenter packaged with circuit breakers
- Factory-installed 5-circuit terminal block(s)
- Twin-stacked neutral design



#### Quick-Pro<sup>SM</sup>

All you need to know to save time and make more money.

Specified on certain Eaton products, the Quick-Pro symbol allows for immediate recognition of products that are designed for straightforward installation. When you see Quick-Pro, you know you can install quickly—sometimes up to 50% less than the usual installation time—and move onto your next job.

#### Features, Benefits and Functions

- Factory-installed terminal block(s) allows installer to terminate existing short wires without using wire nuts or junction boxes
- Twin-stacked neutrals are mounted up high in the loadcenter, which allows for all neutral and ground wires to be terminated in the top half of the loadcenter
- Specifically designed for the service contractor—this is the ONLY renovation line in the industry
- Single-pole and two-pole breakers included
- 10-year warranty on loadcenter and breakers

### Product Selection

#### BR2020B100RN



#### BR Value Packs <sup>①</sup>

Main Breaker Type	Description	Wire Size Range	Number of 5-Circuit Terminal Blocks	Single-Pole Breakers	Two-Pole Breakers	Catalog Number
BR 10 kAIC	Single-phase 100A 10k main breaker 10/20 circuit surface-mount box is 11.75" wide x 13" tall	#6-1/0	0	(2) BR115	(1) BR230	<b>BR1020B100S11RN</b>
	Single-phase 100A 10k main breaker 10/20 circuit flush-mount box is 11.75" wide x 13" tall		0	(2) BR115	(1) BR230	<b>BR1020B100F11RN</b>
	Single-phase 100A 10 kAIC main breaker 20/20 circuit		1	(5) BR120	(1) BR230	<b>BR2020B100RN</b>
BWH 25 kAIC	Single-phase 200A 25 kAIC main breaker 30/40 circuit	#2-300 kcmil	2	(5) BR115 (5) BR120	(1) BR230 (1) BR250	<b>BR3040B200RN</b>
	Single-phase 200A 25 kAIC main breaker 40/40 circuit		2	(6) BR115 (6) BR120	(1) BR230 (1) BR250	<b>BR4040B200RN</b>

#### Note

<sup>①</sup> Indoor enclosure type.

#### 1

### Options and Accessories

#### Mechanical Interlock Cover

Covers mechanically interlock two breakers—Type BW or BWH main breaker with a Type BR branch breaker.

BR4040B200



#### Mechanical Interlock Cover

Fits Loadcenter Catalog Numbers	Mechanical Interlock Panel Cover Catalog Number Flush
BR816B200RF	BR3RDF5M
BR2040B200R	BR3RDF11M
BR3040B200R	BR3RDF12M
BR4040B200R	BR3RDF13M
BR2040B200	BRCOV20D1FM
BR3040B200	BRCOV30G1FM
BR4040B200	BRCOV40L1FM

BRSF125



3BRS225



BRL200



TDL



#### Field Installation Kits and Parts

Number of Poles	Ampere Rating	Number of 1-Inch (25.4 mm) Spaces Needed	Wire Size Range Cu/Al 60°C or 75°C	Ordering Quantity <sup>②</sup>	Catalog Number
<b>Main and Sub-Feed Lug Blocks</b>					
2	125	2	#8–2/0	1	BRSF125
	150	2	#8–2/0	1	BRSF150 <sup>②</sup>
	225	4	#2–300 kcmil	1	BRS225
3	150	3	#8–2/0	1	3BRSF150 <sup>②</sup>
	225	6	#2–300 kcmil	1	3BRS225
<b>Main Lugs</b>					
Two-pole, 200A stud mounted (includes deadfront filler plate)			#1–300 kcmil	1	BRL200
Neutral/ground lug			#2/0 maximum	1	NL20
Add-on neutral or ground lug			#3/0 maximum	1	NL30
			300 kcmil maximum	1	NL300
<b>Filler Plates</b>					
1-inch (25.4 mm) circuit breaker space				25	BRFP
BW main circuit breaker space (with hardware)				1	BWFP
Door lock—12–42 circuits, and 100–225A				1	TDL
Door lock—4–8 circuits, 125A				1	CH9FL
ANSI-61 light gray touchup paint for current loadcenters				1	SPC61
Isolated neutral assembly (computer circuits)				1	BINA
Circuit directory—adhesive backed				10	TCD
Cover screws				25	LCCS
Cover replacement latch (gray) 14-5/16 (363.5 mm) wide loadcenters only				1	BRRL
Circuit marking strip (next to breaker)				10	BRMS
Circuit identification label (preprinted breaker labels)				25	CHBL
Series rated caution label				25	SRL
Bonding strip with screw				1	BSSUSE

#### Notes

- ① Must be purchased in multiples of ordering quantities indicated.
- ② #8–2/0 wire size range is 75°C rated only.

### DS300H2



### Field Installation Rainproof Conduit Hubs

#### Description

Group 1—for use with 70, 100 and 125A MLO and MCB loadcenters and circuit breaker enclosures and the following 150 and 200A panels: BR48B200RF

Group 2—for use with 150, 200 and 225A MLO and MCB loadcenters and circuit breaker enclosures except for the following 200A loadcenters: BR48B200RF. Also for use with 400 and 600A loadcenters and New York City loadcenters manufactured after November 1, 2005

Type H conduit hubs for loadcenters PL0724R and S3100RN

Adapter kit—Allows installing a Group 1 hub on devices arranged for Group 2 hubs

Group 1 small blank hub plate with bump

Group 2 Large blank hub plate with bump

Conduit Size Inches (mm)	Ordering Quantity <sup>①</sup>	Catalog Number
0.75 (19.1)	1	DS075H1
1.00 (25.4)	1	DS100H1
1.25 (31.8)	1	DS125H1
1.50 (38.1)	1	DS150H1
2.00 (50.8)	1	DS200H1
2.00 (50.8)	1	DS200H2
2.50 (63.5)	1	DS250H2
3.00 (76.2)	1	DS300H2
0.75 (19.1)	1	RH75P
1.00 (25.4)	1	RH100P
1.25 (31.8)	1	RH125P
1.50 (38.1)	1	RH150P
—	1	DS900AP
—	1	DS900CP1
—	1	DS900CP2

### GBK14



### BRGBK39512



### Ground Bar Kits

Description (See Legend)	Length Inches (mm)	Ordering Quantity <sup>①</sup>	Catalog Number
●○○○○●○	2.54 (64.5)	1	GBK5 <sup>②</sup>
●○○○○●■	3.59 (91.2)	1	GBK520 <sup>②</sup>
●○○○○●○○○○○	4.29 (109.0)	1	GBK10 <sup>②</sup>
●○○○○●○○○○○■	5.34 (135.6)	1	GBK1020 <sup>②</sup>
○●○○○○○■●○○○○○	4.61 (117.1)	1	GBK13 <sup>②</sup>
●○○○○●○○○○○○○○○○	5.69 (144.5)	1	GBK14 <sup>②</sup>
●○○○○●○○○○○○○○○○■	6.74 (171.2)	1	GBK1420 <sup>②</sup>
●○○○○●○○○○○○○○○○○○○○○○	8.14 (206.8)	1	GBK21 <sup>②</sup>
●○○○○●○○○○○○○○○○○○○○○○■	9.19 (233.4)	1	GBK2120 <sup>②</sup>
○■○●○○○○○■○○○○○●○○○○○	5.78 (146.8)	1	BRGBK39512 <sup>③④</sup>
○○○○○	1.84 (46.7)	1	GB4NM <sup>⑤</sup>

#### Ground Bar Legend

- (3) #14–10 Cu/Al or (1) #14–4 Cu/Al
- (1) #6–2/0 Cu/Al
- (1) #14–1/0 Cu/Al or (3) #14–10 Cu/Al
- ◐ (1) #14–6 Cu/Al or (2) #14–12 Cu/Al
- Mounting Hole

#### Notes

- ① Must be purchased in multiples of ordering quantities indicated.
- ② Distance between mounting holes is 1.75 inches (44.5 mm).
- ③ For single- and three-phase 400 and 600A applications.
- ④ Distance between mounting holes is 2.34 inches (59.5 mm).
- ⑤ For non-metallic enclosures. Snaps into molded base.

**BR Circuit Breakers**



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**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 and 2008 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.

**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 83** 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 83** 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



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

#### 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.

# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

1

#### BR Breakers



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

Three-Pole 240 Vac  
Common Trip Requires Three  
1-Inch (25.4 mm) Spaces  
5 per Shelf Carton



Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	10 kAIC Catalog Number	22 kAIC Catalog Number
10	#14-4	BR310	—
15	#14-4	BR315 ①	BRH315
20	#14-4	BR320 ①	BRH320
25	#14-4	BR325	BRH325
30	#14-4	BR330	BRH330
35	#14-4	BR335	BRH335
40	#14-4	BR340	BRH340
45	#14-4	BR345	BRH345
50	#14-4	BR350	BRH350
55	#14-3	BR355	BRH355
60	#4-1/0	BR360	BRH360
70	#4-1/0	BR370	BRH370
80	#4-1/0	BR380	BRH380
90	#4-1/0	BR390	BRH390
100	#4-1/0	BR3100	BRH3100

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

#### Type BR AFCI Circuit Breaker



#### Type BR, 1-Inch (25.4 mm) Wide FIRE-GUARD AFCI Circuit Breakers

Poles	Ampere Rating	Configuration	Catalog Number
Single-pole 10 kAIC	15	AFCI	BR115AF ②
	20	AFCI	BR120AF ②
Single-pole 22 kAIC	15	AFCI	BRH115AF
	20	AFCI	BRH120AF
Two-pole 10 kAIC ③④	15	AFCI Common Trip	BRL215AF
	20	AFCI Common Trip	BRL220AF

#### 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 Clamshell packaging available with CS modification code on the end of catalog number.
  - ③ Common trip refers to two-pole 240V load application sourced by 120/240 Vac (see **Page 83**).
  - ④ Independent trip refers to two-pole multi-wire, home run or shared neutral circuits (see **Pages 83 and 83**).
- 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.

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

**Type BR, 1-Inch (25.4 mm) wide FIRE-GUARD Combination Type AFCI Circuit Breakers**

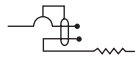
Poles	Ampere Rating	Configuration	Catalog Number
Single-pole 10 kAIC	15	AFCI	BR115CAF ① BRC115CAF
	20	AFCI	BR120CAF ① BRC120CAF
	15	AFCI	BRLH115CAF ①
Single-pole 15 kAIC	22	AFCI	BRLH120CAF ①
	15	AFCI	BR215CAF
Two-pole 10 kAIC	20	AFCI	BR220CAF

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

**Type GFCB Single-Pole**



**Type GFCB Ground Fault Circuit Breakers—5 Milliampere—1-Inch (25.4 mm) per Pole 120 Vac or 120/240 Vac, 10 kAIC**



**Single-Pole 120 Vac**  
Requires One  
1-Inch (25.4 mm) Space  
1 per Shelf Carton  
Catalog Number ②



**Two-Pole 120/240 Vac**  
Common Trip Requires Two  
1-Inch (25.4 mm) Spaces  
1 per Shelf Carton  
Catalog Number

**Type GFCB Two-Pole**



Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	Single-Pole 120 Vac Requires One 1-Inch (25.4 mm) Space 1 per Shelf Carton Catalog Number ②	Two-Pole 120/240 Vac Common Trip Requires Two 1-Inch (25.4 mm) Spaces 1 per Shelf Carton Catalog Number
15	#14–4	GFCB115	GFCB215
20	#14–4	GFCB120	GFCB220
25	#14–4	GFCB125	GFCB225
30	#14–4	GFCB130	GFCB230
40	#14–4	GFCB140	GFCB240
50	#14–4	—	GFCB250 ③
60	#14–6	—	GFCB260

**Notes**

- ① Clamshell packaging available with CS modification code on the end of catalog number.
- ② Available with bell alarm or auxiliary switch. See circuit breaker accessories on **Page 81**.
- ③ For use with copper wire only.

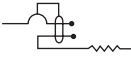
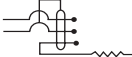
# 1.2

## Loadcenters and Circuit Breakers



### Type BR Loadcenters and Circuit Breakers

1

#### Type GFCBH Ground Fault Breakers—5 Milliampere— 1-Inch (25.4 mm) per Pole 120 Vac or 120/240 Vac, 22 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C		
		Single-Pole 120 Vac Requires One 1-Inch (25.4 mm) Space 1 per Shelf Carton Catalog Number	Two-Pole 120/240 Vac Common Trip Requires Two 1-Inch (25.4 mm) Spaces 1 per Shelf Carton Catalog Number
15	#14–4	GFCBH115	GFCBH215
20	#14–4	GFCBH120	GFCBH220
25	#14–4	GFCBH125	GFCBH225
30	#14–4	GFCBH130	GFCBH230

#### Type GFEP Ground Fault Equipment Protectors—30 Milliampere— 1-Inch (25.4 mm) per Pole 120 Vac or 120/240 Vac, 10 kAIC

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C		
		Single-Pole 120 Vac Requires One 1-Inch (25.4 mm) Space 1 per Shelf Carton Catalog Number	Two-Pole 120/240 Vac Common Trip Requires Two 1-Inch (25.4 mm) Space 1 per Shelf Carton Catalog Number
15	#14–4	GFEP115	GFEP215
20	#14–4	GFEP120	GFEP220
25	#14–4	GFEP125	GFEP225
30	#14–4	GFEP130	GFEP230
40	#14–4	—	GFEP240
50	#14–4	—	GFEP250 <sup>①</sup>

**Note**

<sup>①</sup> For use with copper wire only.

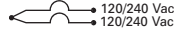
### CTL Plug-On Circuit Breakers, Type BD Duplex, BQ and BQC Quadplex—10 kAIC, 120/240 Vac

BD2020



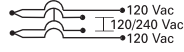
#### Class CTL, 1-Inch (25.4 mm) per Pole 10 kAIC—All Circuit Breakers Have Rejection Tab Feature

Type BD Duplex  
(UL Type BRD)



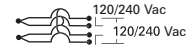
Single-Pole ②  
Requires One 1-Inch  
(25.4 mm) Space  
10 per Shelf Carton

Type BQ Quadplex Independent Trip  
(UL Type BRD)



Two-Pole ① and Single-Pole ②  
Requires Two 1-Inch  
(25.4 mm) Spaces  
5 per Shelf Carton

Type BQ Quadplex Independent Trip  
(UL Type BRD)



Two-Pole  
Requires Two 1-Inch  
(25.4 mm) Spaces  
5 per Shelf Carton

BQ2302115



BQ230230



Ampere Rating	Catalog Number	Wire Size Range Cu/Al 65°C or 75°C	Ampere Rating			Catalog Number	Ampere Rating		
			Outer Left Single-Pole	Center Two-Pole Independent Trip	Outer Right Single-Pole		Outer Two-Pole Independent Trip	Center Two-Pole Independent Trip	Catalog Number
10–10	BD1010	#14–4	15	20	15	BQ2202115	15	15	BQ215215
15–15	BD1515	#14–4	20	20	20	BQ2202120	15	20	BQ215220
15–20	BD1520	#14–4	15	30	15	BQ2302115	15	30	BQ215230
15–30	BD1530	#14–4	20	30	20	BQ2302120	15	40	BQ215240
20–15	BD2015	#14–4	15	40	15	BQ2402115	15	50	BQ215250
20–20	BD2020	#14–4	20	40	20	BQ2402120	20	20	BQ220220
20–30	BD2030	#14–4	15	50	15	BQ2502115	20	30	BQ220230
25–25	BD2525	#14–4	20	50	20	BQ2502120	20	40	BQ220240
30–15	BD3015	#14–4	—	—	—	—	20	50	BQ220250
30–20	BD3020	#14–4	—	—	—	—	25	25	BQ225225
30–30	BD3030	#14–4	—	—	—	—	30	30	BQ230230
30–40	BD3040	#14–4	—	—	—	—	30	40	BQ230240
30–50	BD3050	#14–4	—	—	—	—	30	50	BQ230250
50–30	BD5030	#14–4	—	—	—	—	40	40	BQ240240
50–50	BD5050	#14–4	—	—	—	—	40	50	BQ240250
—	—	—	—	—	—	—	50	50	BQ250250

**Notes**

- ① All Type BD duplex and BQ quadplex circuit breakers carry listing for HACR applications.
- ② All 15 and 20A single poles are switch-duty rated.

# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

1

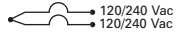
#### Non-CTL Plug-On Replacement—Circuit Breakers, Type BRD—10 kAIC, 120/240 Vac

BR2020



#### Class Non-CTL, 1-Inch (25.4 mm) per Pole 10 kAIC—Breakers Do Not Have Rejection Tab Feature

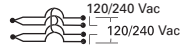
##### Type BR Duplex



Single-Pole Requires One 1-Inch (25.4 mm) Space 10 per Shelf Carton

120 Vac

##### Type Brand BRD Quadplex Independent Trip

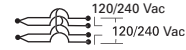


Two-Pole Requires Two 1-Inch (25.4 mm) Spaces 5 per Shelf Carton

120/240 Vac

120/240 Vac

##### Type BRD Quadplex Common Trip Center and Outer Poles

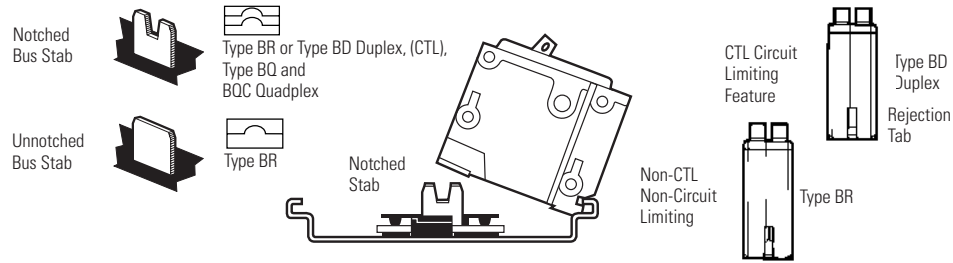


Two-Pole Requires Two 1-Inch (25.4 mm) Spaces 5 per Shelf Carton

120/240 Vac

Ampere Rating	Catalog Number	Wire Size Range Cu/Al 65°C or 75°C	Ampere Rating		Catalog Number	Ampere Rating		Catalog Number
			Outer Two-Pole Independent Trip	Center Two-Pole Independent Trip		Outer Two-Pole Common Trip	Center Two-Pole Common Trip	
15–15	BR1515	#14–4	15	15	BR415	15	15	BRDC215215
15–20	BR1520	#14–4	20	20	BR420	30	30	BRDC230230
20–15	BR2015	#14–4	30	30	BR430	30	40	BRDC230240
20–20	BR2020	#14–4	20	30	BRD220230	30	50	BRDC230250
30–30	BR3030	#14–4	30	40	BRD230240	—	—	—
30–50	BR3050	#14–4	30	50	BRD230250	—	—	—

#### CTL and Non-CTL Breakers



#### Note

Type BD Duplex, BQ and BQC Quadplex (CTL) circuit breakers conform to Section 384-15 of the latest National Electrical Code. Install breaker only in panel positions that have notched bus stabs.

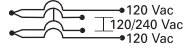
### Common Trip Quadplex Breakers

BQC2302115



### Class CTL, 1-Inch (25.4 mm) per Pole 10 kAIC—All Circuit Breakers Have Rejection Tab Feature

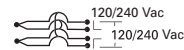
Type BQC Quadplex Common Trip Center Poles (UL Type BRD)



Two-Pole <sup>③</sup> and Single-Pole <sup>④</sup>  
Requires Two 1-Inch (25.4 mm) Spaces  
5 per Shelf Carton

120 Vac      120/240 Vac      120 Vac

Type BQC Quadplex Common Trip Center and Outer Poles (UL Type BRD)



Two-Pole <sup>③</sup>  
Requires Two 1-Inch (25.4 mm) Spaces  
5 per Shelf Carton

120/240 Vac

BQC2302115



Ampere Rating			Catalog Number	Wire Size Range Cu/Al 65°C or 75°C	Ampere Rating		
Outer Left Single-Pole	Center Two-Pole Common Trip	Outer Right Single-Pole			Outer Two-Pole Common Trip	Center Two-Pole Common Trip	Catalog Number
15	20	15	BQC2202115	#14-4	15	15	BQC215215
15	25	15	BQC2252115	#14-4	15	20	BQC215220
15	30	15	BQC2302115	#14-4	15	30	BQC215230
15	40	15	BQC2402115	#14-4	20	15	BQC220215
15	50	15	BQC2502115	#14-4	20	20	BQC220220
—	—	—	—	#14-4	20	30	BQC220230
—	—	—	—	#14-4	20	40	BQC220240
—	—	—	—	#14-4	20	50	BQC220250
20	15	20	BQC2152120	#14-4	25	25	BQC225225
20	20	20	BQC2202120	#14-4	25	30	BQC225230
20	25	20	BQC2252120	#14-4	30	15	BQC230215
20	30	20	BQC2302120	#14-4	30	30	BQC230230
20	40	20	BQC2402120	#14-4	30	40	BQC230240
20	50	20	BQC2502120	#14-4	30	50	BQC230250
30	50	20	BQC2502030	#14-4	40	30	BQC240230
—	—	—	—	#14-4	40	40	BQC240240
—	—	—	—	#14-4	40	50	BQC240250
—	—	—	—	#14-4	50	20	BQC250220
—	—	—	—	#14-4	50	50	BQC250250

**Notes**

- ③ All Type BQC quadplex circuit breakers carry listing for HACR applications.
- ④ All 15 and 20 ampere single poles are switch-duty rated.

# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

1

#### Plug-On Circuit Breakers, Types BJ and BJH—10/22 kAIC, 120/240 Vac and 240 Vac

For Use in Single-Phase and Three-Phase Loadcenters—150 Amperes and Above

##### Type BJ



#### Types BJ and BJH Breakers, 1-Inch (25.4 mm) per Pole, 120/240 or 240 Vac, 10, 22 kAIC



Two-Pole 120/240 Vac  
Common Trip Requires Four  
1-Inch (25.4 mm) Spaces <sup>①</sup>  
10 per Shelf Carton



Three-Pole 240 Vac  
Common Trip Requires Six  
1-Inch (25.4 mm) Spaces <sup>②</sup>  
5 per Shelf Carton

Ampere Rating	10 kAIC		Wire Size Range Cu/Al 60°C or 75°C	22 kAIC	
	Catalog Number	Catalog Number		Catalog Number	Catalog Number
125	BJ2125	BJH2125	#2–300 kcmil	BJ3125	BJH3125
150	BJ2150	BJH2150	#2–300 kcmil	BJ3150	BJH3150
175	BJ2175	BJH2175	#2–300 kcmil	BJ3175	BJH3175
200	BJ2200	BJH2200	#2–300 kcmil	BJ3200	BJH3200
225	BJ2225	BJH2225	#2–300 kcmil	BJ3225	BJH3225

#### Plug-On Special Application Circuit Breakers—10 kAIC, 120 Vac, 120/240 Vac and 240 Vac

##### BRWH215

Water Heater Breaker



##### BRSN220

Switching Neutral Breaker



#### Special Application Circuit Breakers, 1-Inch (25.4 mm) per Pole

##### Water Heater Breakers



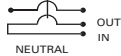
Two-Pole 120/240 Vac  
Common Trip Requires Two  
1-Inch (25.4 mm) Spaces

With Isolated Line Terminals  
for Separately Metered  
Water Heaters

5 per Shelf Carton

10 kAIC

##### Switching Neutral Breakers



Two-Pole 120 Vac  
Common Trip Requires Two  
1-Inch (25.4 mm) Spaces

With Switching Neutral Pole  
for Gasoline Pump Applications

5 per Shelf Carton

10 kAIC

##### 240V Breakers



Two-Pole 240 Vac  
Common Trip Requires Two  
1-Inch (25.4 mm) Spaces

Where Voltage to  
Ground is 240 Vac

5 per Shelf Carton

10 kAIC

##### Non-Automatic Molded Case Switches



Two-Pole 240 Vac  
Requires Two  
1-Inch (25.4 mm) Spaces

For Use as Disconnect Contains No  
Magnetic or Thermal Trip Properties

5 per Shelf Carton

5 kAIC

Ampere Rating	Catalog Number	Ampere Rating	Catalog Number	Wire Size Range Cu/Al 60°C or 75°C	Ampere Rating	Catalog Number	Ampere Rating	Catalog Number
15	BRWH215	15	BRSN215	#14–4	10	BR210H	—	—
20	BRWH220	20	BRSN220	#14–4	15	BR215H	—	—
30	BRWH230	25	BRSN225	#14–4	20	BR220H	—	—
—	—	30	BRSN230	#14–4	25	BR225H	—	—
—	—	—	—	#14–4	30	BR230H	—	—
—	—	—	—	#14–4	35	BR235H	—	—
—	—	—	—	#14–4	40	BR240H	—	—
—	—	—	—	#14–4	45	BR245H	—	—
—	—	—	—	#14–4	50	BR250H	50	BR250NA
—	—	—	—	#14–4	55	BR255H	—	—
—	—	—	—	#4–1/0	60	BR260H	60	BR260NA
—	—	—	—	#4–1/0	70	BR270H	—	—
—	—	—	—	#4–1/0	80	BR280H	—	—
—	—	—	—	#4–1/0	90	BR290H	—	—
—	—	—	—	#4–1/0	100	BR2100H	100	BR2100NA

##### Notes

① Breaker uses two 1-inch (25.4 mm) pole spaces on left side and two 1-inch (25.4 mm) pole spaces on right side of loadcenter.

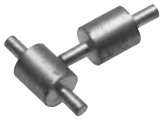
② Breaker uses three 1-inch (25.4 mm) pole spaces on left side and three 1-inch (25.4 mm) pole spaces on right side of loadcenter.

If BJ or BJH breakers are used as a main or a back feed device, a hold-down kit is required. See **Page 81**.



### Circuit Breaker Accessories

THS1



BHLW2



BRQLW



MCBPL (Installed)



BHLW



BRLW2



BREQS125



BRHDK125



### Field Installation Kits and Parts

#### Description

Ordering Quantity <sup>①</sup>

Catalog Number

#### Handle Ties <sup>②</sup>

Handle tie bar for physically joining the handles of two adjacent single-pole Type BR circuit breakers (metal cylinder pin type)

10

**BHT**

Handle tie bar for joining two independent outside poles of Types BQ and BQC Quadplex and outside poles of two Type BD duplex circuit breakers

10

**THOW**

Handle tie bar for joining two adjacent outside poles of Types BQ and BQC Quadplex and outside poles of two Type BD duplex circuit breakers

10

**THS1**

#### Handle Lockoffs <sup>③④</sup>

Padlockable device for locking the handle of single-, two- or three-pole Type BR Circuit Breakers and single-pole of a Type BD Duplex or one independent outside pole of a Type BQ or BQC Quadplex circuit breakers (escutcheon mounted) <sup>⑤</sup>

10

**BRLW**

Padlockable device for locking the handle of a single-pole Type BR circuit breaker.(handle mounted) <sup>⑥</sup>

10

**BRLW1**

Padlockable device for locking the handle of a two- and three-pole Type BR circuit breaker (handle mounted) <sup>⑥</sup>

10

**BRLW2**

Padlockable device for locking the handle of a single-pole Type BD Duplex, BQ or BQC Quadplex breaker (handle mounted) <sup>⑥</sup>

10

**BRDL1**

Padlockable device for locking the handle of the two center poles and the two outer poles of a two-pole Types BQ and BQC quadplex circuit breakers (escutcheon mounted) <sup>⑤</sup>

10

**BRQLW**

Padlockable device for locking the handle of main circuit breaker Types CC and CHH into the ON or OFF position (screw mounted) <sup>⑦</sup>

1

**CCPL**

Padlockable device for locking the handle of main breaker Types BW and BWH into the ON or OFF position (escutcheon Mounted) <sup>⑤</sup>

1

**MCBPL**

Device used to secure handle in ON or OFF position for single-, two- or three-pole Type BR circuit breakers and single-pole of Type BD duplex and one independent outside pole of Type BQ or BQC Quadplex circuit breakers (escutcheon mounted) <sup>⑤</sup>

10

**BHLW**

Device used to secure handle in ON or OFF position for single-pole Type BR circuit breakers (handle mounted) <sup>⑥</sup>

10

**BHLW1**

Device used to secure handle in ON or OFF position for two- and three-pole Type BR circuit breakers (handle mounted) <sup>⑥</sup>

10

**BHLW2**

Device used to secure handle in ON or OFF position for single-pole Type GFCB ground fault circuit breakers (handle mounted) <sup>⑥</sup>

10

**BHGW**

Device used to secure handle in ON or OFF position for one independent outside pole of Types BQ and BQC Quadplex or single-pole Type BD duplex circuit breakers (handle mounted) <sup>⑥</sup>

10

**HLW1**

#### Hold-Down Kits <sup>⑧</sup>

Hold-down retainer kit for three-pole Type BR circuit breakers in S3100 and 3100R loadcenters only

1

**BRHDB**

Hold-down screw kit for two-pole Type BR circuit breakers in single-phase MLO loadcenters through 125A

1

**BREQS125**

Hold-down screw kit for two-pole Type BR circuit breakers in MLO loadcenters 150–225A (single-phase only)

1

**BRHDK125**

Hold-down screw kit for two-pole Types BJ and BJH circuit breakers in MLO loadcenters 125–225A

1

**BJHDS**

Hold-down screw kit for three-pole Types BJ and BJH circuit breakers in MLO loadcenters 125–225A

1

**BJHDS3P**

#### Main Breaker Lug Kits

Types CC and CHH main breaker lug kit (2) 300 kcmil

1

**CCL300**

Types BW/BWH main breaker lug kit (2) 300 kcmil

1

**MCBL300**

#### Notes

<sup>①</sup> Must be purchased in multiples of ordering quantities indicated.

<sup>②</sup> Handle ties: typically used to join two similar independent single-pole breakers to form a two-pole noncommon trip breaker.

<sup>③</sup> Handle lockoffs: devices that use a padlock to lock the circuit breaker's handle in the ON or OFF position.

<sup>④</sup> See table on **Page 82** for handle position changeability chart.

<sup>⑤</sup> Escutcheon mounted: device mounted semipermanently to the face of the circuit breaker and secured by the loadcenter deadfront.

<sup>⑥</sup> Handle mounted: device mounted directly to the handle by the use of a set screw.

<sup>⑦</sup> Screw mounted: device permanently mounted to the face of the circuit breaker by the use of a non-removable screw.

<sup>⑧</sup> Handle lockdogs: devices that are used to secure a circuit breaker's handle in the ON or OFF position. Handle Lockdogs are not padlockable devices.

<sup>⑨</sup> Hold-down kits: devices used to secure the circuit breaker to the loadcenter for back-feed main application. See NEC Article 384-16(g).

1

BRML



#### Field Installation Kits and Parts, continued

Description	Ordering Quantity <sup>①</sup>	Catalog Number
<b>Mechanical Interlocks</b>		
Types BR for two-, three- and four-pole breakers	10	<b>BRML</b>
	10	<b>BRPLOFF</b>
	10	<b>BRPLOFF2P</b>
	10	<b>BRPLOFF3P</b>
	10	<b>BJL2P</b>
	10	<b>BJL3P</b>
	10	<b>GHQRLOFF2P</b>
	10	<b>GHQRLOFF</b>
	10	<b>QCD123PLOFF</b>

#### Shunt Trips, Auxiliary and Alarm Contacts

Description	Catalog Number <sup>②</sup> Suffix Adder
<b>Shunt Trip for Types BW/BWH</b>	
12 Volts	<b>SR12</b>
24 Volts	<b>SR24</b>
120 Volts	<b>SR01</b>
<b>Shunt Trip for Types BR</b>	
120 Volts	<b>ST</b>
<b>Auxiliary Contact for Types BW/BWH</b>	
1NO and 1NC	<b>AL1</b>
2NO and 2NC	<b>AL2</b>
<b>Alarm Contacts for Types BW/BWH</b>	
Types BW/BWH	<b>CR1</b>
<b>Alarm Contacts for Type GFCB (Single-Pole)</b>	
Alarm contact for GFCB (single-pole)	<b>W1</b>
1NO and 1NC	<b>W2</b>

#### Handle Position Changeability Chart

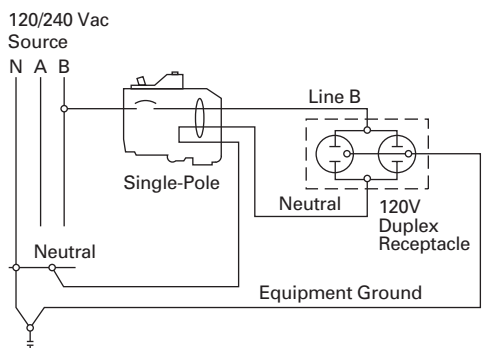
Handle Lockoff and Lockdog Types	To Change Handle Position from ON to OFF, or OFF to ON You Must...		
	Remove Padlock	Remove Device	Remove Loadcenter Deadfront
Lockoff escutcheon mounted	Remove	—	—
Lockoff handle mounted	Remove	Remove	—
Lockoff screw mounted	Remove	—	—
Lockdog escutcheon mounted	N/A	Remove	Remove
Lockdog handle mounted	N/A	Remove	—

#### Notes

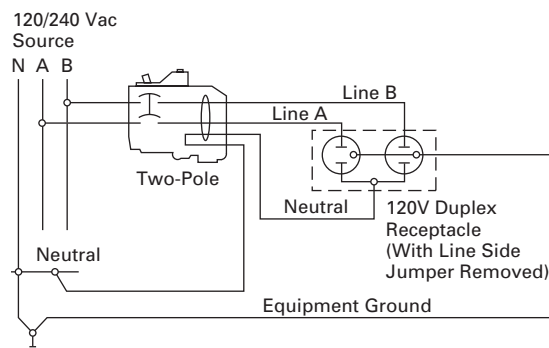
- ① Must be purchased in multiples of ordering quantities indicated.
- ② Add suffix indicated to end of breaker catalog number.

### Wiring Diagrams

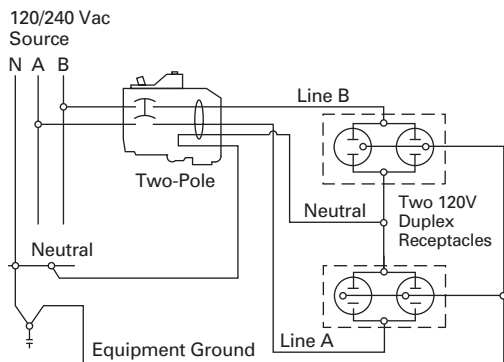
**Single-Pole 120V Load Application Sourced by 120/240 Vac**



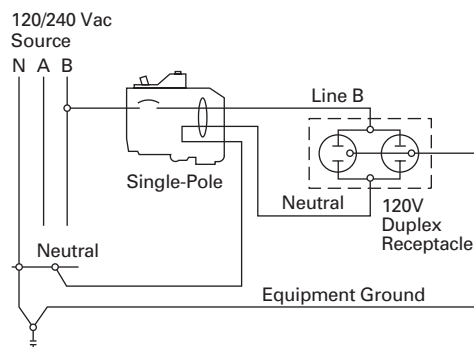
**Two-Pole Shared Neutral with Duplex Receptacle Application**



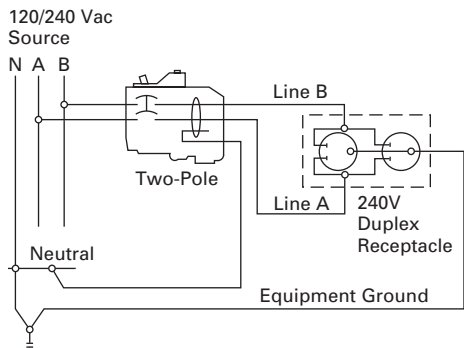
**Two-Pole Shared Neutral with Multi-Duplex Receptacle Application**



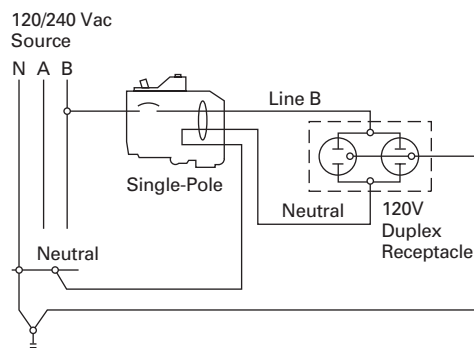
**Single-Pole 120V Load Application Sourced by 120/240 Vac**



**Two-Pole 240V Load Application Sourced by 120/240 Vac**



**Single-Pole 120V Duplex Receptacle Application**

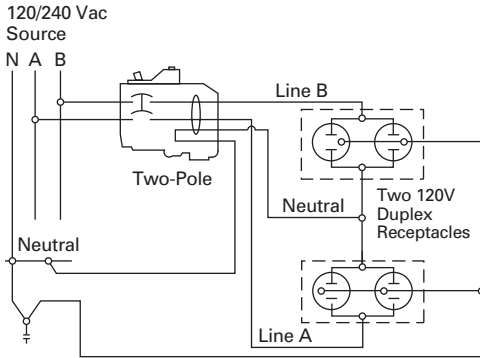


# 1.2

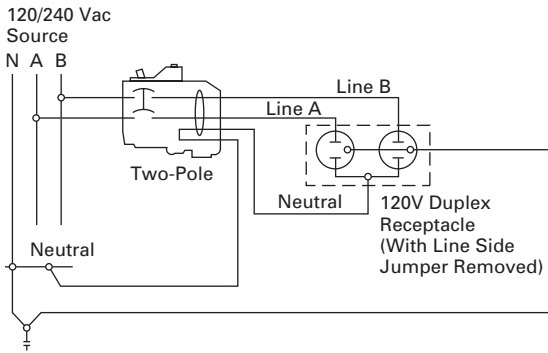
## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

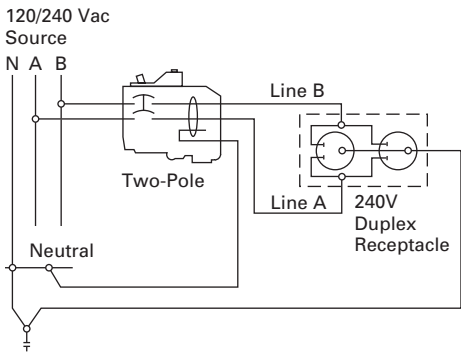
#### 1 Two-Pole 120V Multi-Duplex Receptacle Application



#### Two-Pole 120V Duplex Receptacle Application



#### Two-Pole 240V Duplex Receptacle Application



### Dimensions

Approximate Dimensions in Inches (mm)

#### Residential/Commercial/New York City Loadcenters, Unit Enclosures—Box Sizes

**Note:** Box sizes do not include covers/fronts.

#### Residential Loadcenters—NEMA Type 1 Indoor

Box Size	Height	Width	Depth
A1	15.00 (381.0)	11.25 (285.8)	3.75 (95.3)
B1	16.75 (425.5)	14.31 (363.5)	3.88 (98.4)
B2	18.75 (476.3)	14.31 (363.5)	3.88 (98.4)
C1	21.00 (533.4)	14.31 (363.5)	3.88 (98.4)
C2	23.00 (584.2)	14.31 (363.5)	3.88 (98.4)
C4	27.00 (685.8)	14.31 (363.5)	3.88 (98.4)
D1	29.13 (739.8)	14.31 (363.5)	3.88 (98.4)
G1	34.13 (866.8)	14.31 (363.5)	3.88 (98.4)
L1	39.00 (990.6)	14.31 (363.5)	3.88 (98.4)
L2	45.00 (1143.0)	14.31 (363.5)	3.88 (98.4)
2	8.63 (219.1)	5.00 (127.0)	3.50 (88.9)
3	9.44 (239.7)	4.50 (114.3)	3.00 (76.2)
4	13.00 (330.2)	11.00 (279.4)	3.56 (90.5)
5	9.44 (239.7)	4.50 (114.3)	3.00 (76.2)
6	12.00 (304.8)	6.88 (174.6)	4.50 (114.3)
7	13.00 (330.2)	11.00 (279.4)	3.56 (90.5)
9	14.50 (368.3)	6.50 (165.1)	3.50 (88.9)

#### Residential Loadcenters—NEMA Type 3R Outdoor

Box Size	Height	Width	Depth
B1R	16.75 (425.5)	14.31 (363.5)	5.19 (131.8)
B2R	18.75 (476.3)	14.31 (363.5)	5.19 (131.8)
C3R	25.00 (635.0)	14.31 (363.5)	5.19 (131.8)
D1R	29.13 (739.8)	14.31 (363.5)	5.19 (131.8)
G1R	34.13 (866.8)	14.31 (363.5)	5.19 (131.8)
L1R	39.00 (990.6)	14.31 (363.5)	5.19 (131.8)
L2R	45.00 (1143.0)	14.31 (363.5)	5.19 (131.8)
2R	8.63 (219.1)	5.00 (127.0)	3.50 (88.9)
3R	9.44 (239.7)	4.50 (114.3)	3.00 (76.2)
4R	13.00 (330.2)	11.00 (279.4)	3.56 (90.5)
5R	9.44 (239.7)	4.50 (114.3)	3.00 (76.2)
6R	11.75 (298.5)	6.50 (165.1)	4.50 (114.3)
7R	13.00 (330.2)	11.00 (279.4)	3.56 (90.5)
8R	27.00 (685.8)	10.50 (266.7)	4.75 (120.7)
9R	14.25 (362.0)	6.50 (165.1)	4.00 (101.6)
C1R	21.00 (533.4)	14.31 (363.5)	5.19 (131.8)

#### Commercial Loadcenters—NEMA Type 1 Indoor

Box Size	Height	Width	Depth
19	44.00 (1117.6)	16.16 (410.4)	6.25 (158.8)
20	44.00 (1117.6)	16.16 (410.4)	6.25 (158.8)
22	54.00 (1371.6)	16.22 (412.0)	6.31 (160.3)
24	66.50 (1689.1)	16.22 (412.0)	6.31 (160.3)

#### Commercial Loadcenters—NEMA Type 3R Outdoor

Box Size	Height	Width	Depth
42	38.00 (965.2)	16.31 (414.3)	6.38 (161.9)
43	44.00 (1117.6)	16.31 (414.3)	6.38 (161.9)
46	54.00 (1371.6)	16.31 (414.3)	6.38 (161.9)
47	66.56 (1690.7)	16.31 (414.3)	6.38 (161.9)

#### New York City Loadcenters—NEMA Type 1 Indoor

Box Size	Height	Width	Depth
A	38.00 (965.2)	18.13 (460.4)	5.00 (127.0)
B	44.00 (1117.6)	18.13 (460.4)	5.00 (127.0)
C	66.50 (1689.1)	18.13 (460.4)	6.25 (158.8)

#### Types ECB and ECC Unit Enclosures—NEMA Type 1 Indoor

Height	Width	Depth
23.25 (590.6)	8.88 (225.4)	4.50 (114.3)

#### Types ECB and ECC Unit Enclosures—NEMA Type 3R Outdoor

Height	Width	Depth
23.68 (601.7)	9.31 (236.5)	5.44 (138.1)

# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

1

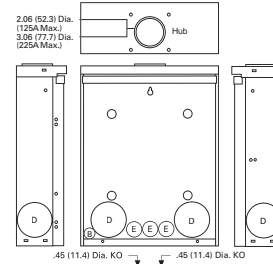
Approximate Dimensions in Inches (mm)

#### Residential Loadcenter Knockouts

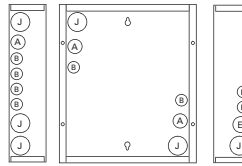
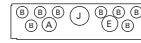
#### Knockouts for Box Sizes A1, B1, B2, C1, C2, C4, D1, G1, L1, L2, B1R, B2R, C1R, C3R, D1R, G1R, L1R, L2R

Code	Diameter				
A	0.50 (12.7)	0.75 (19.1)	—	—	—
B	0.50 (12.7)	—	—	—	—
C	0.50 (12.7)	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)	2.50 (63.5)
D	1.25 (31.8)	1.25 (31.8)	2.00 (50.8)	2.50 (63.5)	—
E	0.50 (12.7)	0.75 (19.1)	1.00 (25.4)	—	—
F	0.50 (12.7)	0.75 (19.1)	1.00 (25.4)	1.50 (38.1)	2.00 (50.8)
G	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)	—	—
H	0.50 (12.7)	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)
I	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)	2.50 (63.5)
J	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)	—	—

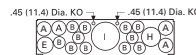
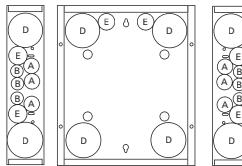
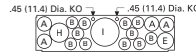
#### Residential NEMA Type 1 Indoor and NEMA Type 3R Outdoor Enclosures



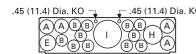
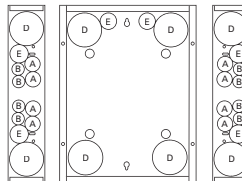
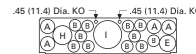
#### Outdoor Boxes B1R, B2R, C1R, C3R, D1R, G1R, L1R, L2R



#### Indoor Boxes A1



#### Indoor Boxes B1, B2



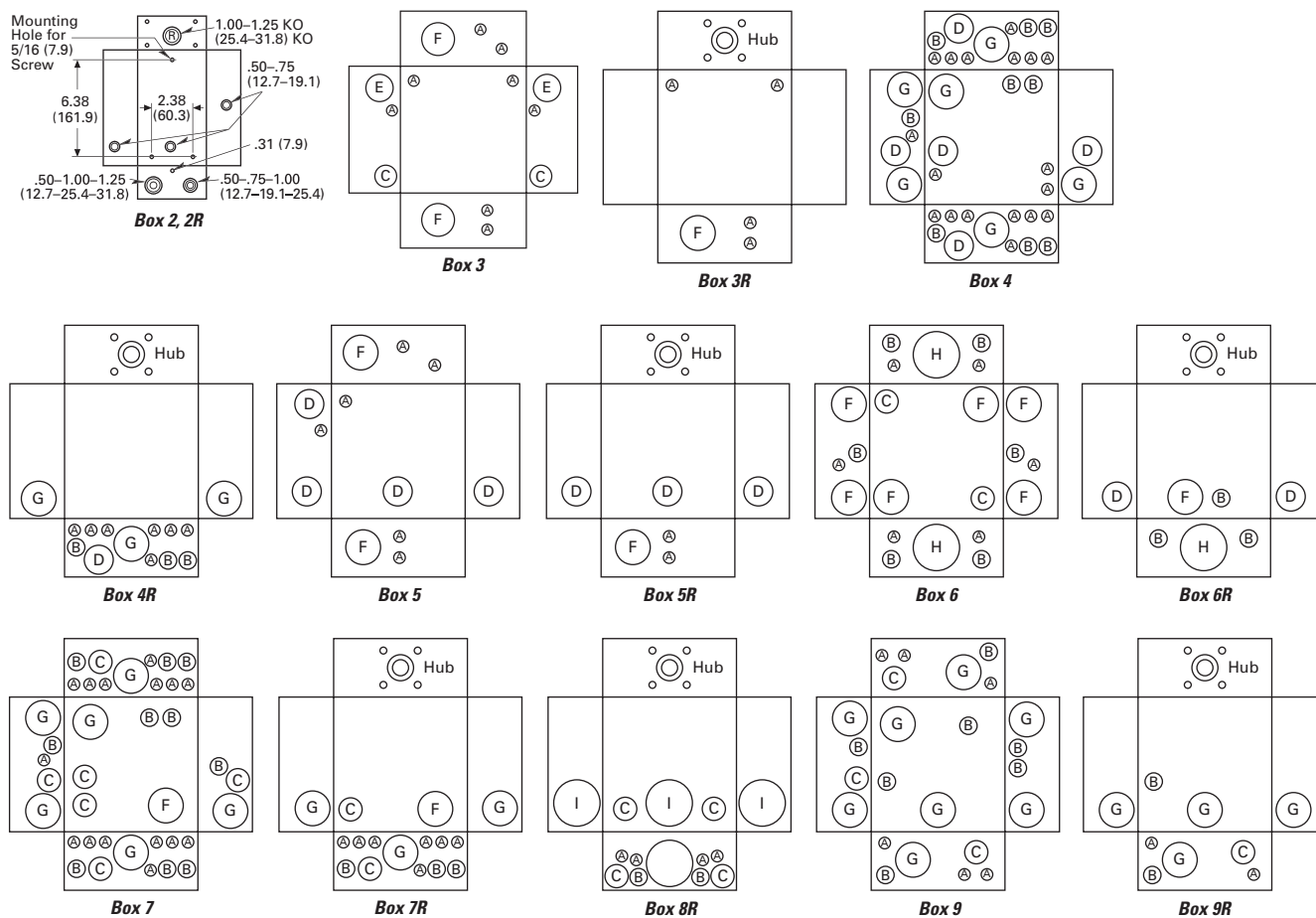
#### Indoor Boxes C1, C2, C4, D1, G1, L1, L2

Approximate Dimensions in Inches (mm)

### Knockouts for Box Sizes 3, 4, 5, 6, 7, 9, 2R, 3R, 4R, 5R, 6R, 7R, 8R, 9R

Code	Diameter			
A	0.50 (12.7)	—	—	—
B	0.50 (12.7)	0.75 (19.1)	—	—
C	0.50 (12.7)	0.75 (19.1)	1.00 (25.4)	—
D	0.50 (12.7)	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)
E	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)	—
F	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)
G	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)	—
H	1.00 (25.4)	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)
I	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)	—

### Residential NEMA Type 1 Indoor and NEMA Type 3R Outdoor Enclosures



# 1.2

## Loadcenters and Circuit Breakers

### Type BR Loadcenters and Circuit Breakers

1

Approximate Dimensions in Inches (mm)

#### Commercial Loadcenter Knockouts

##### NEMA Type 1 Indoor Commercial Enclosures Knockouts for Box Sizes 19, 20, 22, 24

Code	Diameter			
A	0.50 (12.7)	—	—	—
B	0.50 (12.7)	0.75 (19.1)	—	—
C	0.75 (19.1)	1.00 (25.4)	1.50 (38.1)	—
D	1.50 (38.1)	2.00 (50.8)	2.50 (63.5)	3.00 (76.2)
E	2.00 (50.8)	2.50 (63.5)	3.00 (76.2)	—
F	2.50 (63.5)	3.00 (76.2)	3.50 (88.9)	—

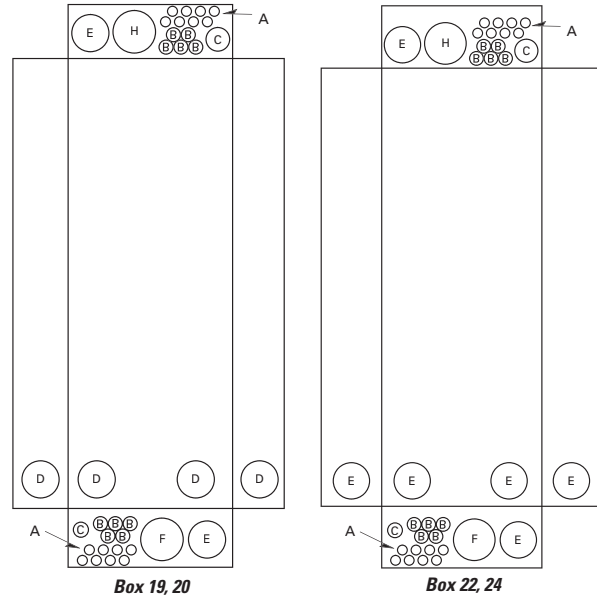
##### NEMA Type 3R Outdoor Commercial Enclosures Knockouts for Box Sizes 42, 43, 46, 47

Code	Diameter			
A	0.50 (12.7)	—	—	—
B	0.50 (12.7)	0.75 (19.1)	—	—
C	0.75 (19.1)	1.00 (25.4)	1.25 (31.8)	—
D	1.50 (38.1)	2.00 (50.8)	2.50 (63.5)	—
E	2.00 (50.8)	2.50 (63.5)	3.00 (76.2)	—
F	2.50 (63.5)	3.00 (76.2)	3.50 (88.9)	—
G	1.25 (31.8)	1.50 (38.1)	2.00 (50.8)	2.50 (63.5)
H	3.25 (82.6) Sq.	—	—	—

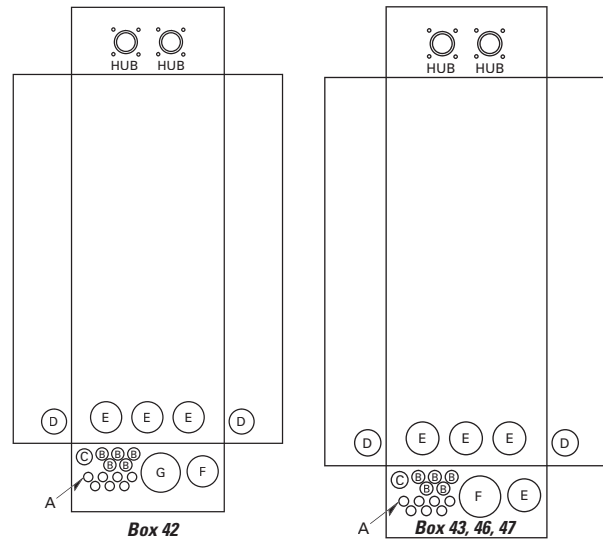
#### Unit Enclosure Knockouts, Types ECB and ECC Knockouts

Code	Diameter			
<b>NEMA Type 1 Indoor (Flush and Surface Trims)</b>				
A	0.50 (12.7)	—	—	—
B	1.25 (31.8)	1.50 (38.1)	1.75 (44.5)	2.00 (50.8)
<b>NEMA Type 3R Outdoor</b>				
A	0.50 (12.7)	—	—	—
B	1.25 (31.8)	1.50 (38.1)	1.75 (44.5)	2.00 (50.8)

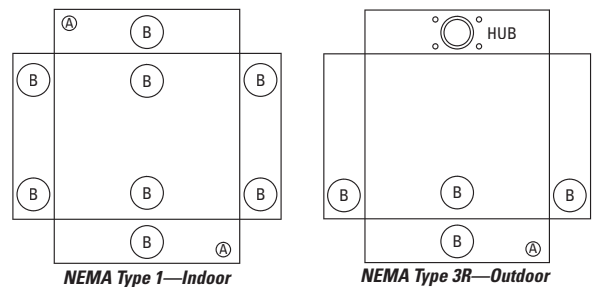
#### Indoor Commercial Enclosures



#### Outdoor Commercial Enclosures



#### Unit Enclosure Knockouts





### OEM Loadcenters



### Contents

<i>Description</i>	<i>Page</i>
Product Selection . . . . .	91
Standards and Certifications . . . . .	90

### Product Description

As a leader in the electrical distribution equipment business, Eaton has a unique product offering for equipment manufacturers, panel builders and virtually any OEM that has a need for power distribution within their equipment. The OEM interior offering consists of a wide variety of power distribution options utilizing components from Eaton's CH and BR loadcenter product lines. With high-volume, standardized products, OEMs can expect to receive high-quality products covering configurations meeting virtually any power distribution need.

Coupled with Eaton's expertise in circuit breaker design and manufacturing, OEM interiors provide solid power distribution and circuit protection in a compact, easy-to-install package. Interiors are offered from 2 to 42 circuits and from 70 to 225A.

### Quality

Built in ISO 9002 certified manufacturing facilities, customers can be assured of the process quality in place for the manufacture of these products. Utilizing the latest in computer-controlled plating, painting, molding, stamping and welding processes, Eaton's customers have come to expect consistent high-quality from shipment to shipment.

### Two Products Offer Design Flexibility

As a manufacturer of two lines of loadcenters, Eaton is in a unique position to offer the broadest range of interiors in the market. Each line has its own unique characteristics that appeal to various segments of the market. OEM interiors are UL recognized components and are listed in either of the following UL files: E8741 or E52977.

The CH interiors feature 100% copper bus and use the CH 3/4-inch (19.1 mm) wide circuit breaker, which minimizes panel space. Recognized by contractors for its sturdy design, the CH interior will appeal to those customers seeking an industrial quality bolted bus bar and the space saving of 3/4-inch (19.1 mm) per bus stab. With a typical 12 circuit CH interior, this space savings amounts to an inch and a half savings over its 1-inch (25.4 mm) counterparts. The stab rating of the CH interiors is 140A maximum meaning that the handle rating of breakers mounted across from one another may not exceed 140A.

The BR interiors are manufactured of formed, plated aluminum or copper, and use Eaton's Type BR 1-inch (25.4 mm) wide circuit breaker. This design affords customers the most circuit flexibility as many of these interiors allow the installation of standard single- and two-pole breakers as well as duplex (two poles in a 1-inch (25.4 mm) space) or quadplex (four poles in a 2-inch (50.8 mm) space) breakers.

The stab rating of the BR interiors is 200A maximum, meaning that the handle rating of the breakers that are mounted across from one another may not exceed 200A.

The interiors are designed for either horizontal (single-row breaker mounting), or vertical (double-row breaker mounting). To comply with National Electrical Code (NEC) requirements, if mounted horizontally, when the breaker is ON, the handle should be in the UP position. When mounted vertically, the handle toggles from left to right, so this is not a concern.

## Standards and Certifications

### Class CTL

National Electrical Code Paragraph 384-15 requires branch circuit panelboards to be provided with physical means to prevent the installation of more overcurrent devices than that number of which the enclosure was designed, rated and approved. Class CTL Duplex, Quadplex and twin breakers (identified by a catalog number prefix BD, BQ, BQC and CHT) are equipped with a UL listed rejection tab over the line terminal. All OEM interiors have appropriately notched stabs to accept these rejection tab Class CTL breakers.

Duplex, Quadplex and twin breakers manufactured without the rejection tab (identified by a catalog number prefix BR, BRD and CHNT) are available for replacement purposes in older interiors.

### Federal Specifications

All loadcenter enclosures meet Federal Specifications W-P-115b, Type 1, Class 2 requirements.

All 120/240V breakers, both 1-inch (25.4 mm), 1/2-inch (12.7 mm) and 3/4-inch (19.1 mm) per pole meet the requirement of Federal Specifications W-C 375B/Gen Type 1.

### Canadian Standards Association Listing

All single-pole and two-pole, 120/240V breakers, both 1-inch (25.4 mm), 1/2-inch (12.7 mm) and 3/4-inch (19.1 mm) per pole, 225A maximum, are listed as Certified by the Canadian Standards Association, Guide No. 69-11.19, Class 1432, File 18328.

### Underwriters Laboratories Listing

All grounding bars manufactured comply with Underwriters Laboratories standards and are listed under Guide No. DHJR, File E31424, Volume W, Section 17.

All circuit breakers 10A and larger comply with the Underwriters Laboratories "Standard for Branch Circuit and Service Circuit-Breakers" UL 489; Guide No. 60 10.2 File E31424, and "Requirements for Wire Connectors and Soldering Lugs," UL 486B, Guide No. 461 10-C File E7830.

All Eaton breakers where marked, are suitable for use with 60/75°C rated wire, unless otherwise specified.

All devices comply with the 22 kAIC–10 kAIC UL series connected components File DKSY2 of the Recognized Components Index.

### Lighting and Appliance Panelboards

Lighting and appliance branch circuit panelboards are defined in NEC (Article 384) as "One having more than 10 percent of its overcurrent devices rated 30A or less for which neutral connections are provided." Article 384 also limits the number of overcurrent devices (branch circuit poles) to a maximum of 42 in any one cabinet. When the 42 poles are exceeded, two or more separate panels are required.

For more details and engineering drawings, see BR.31.02.S.E.



### Product Selection

BR Loadcenter Interior Assembly



#### Type BR Loadcenter Interior Assemblies

Ampere Rating	Maximum Number 1-Inch (24.5 mm)		UL File Reference	Main Terminal Size (Per Phase)	Standard Package Quantity	Catalog Number
	Spaces	Single Poles				
<b>Single-Phase Single Row Breaker Mounting—Aluminum Bus—120/240 Vac, Three-Wire</b>						
70	2	4	—	(1) #8-#2 AWG Cu/Al	20	24INT70B
125	2	4	E8741	(1) 1/0-#14 AWG Cu 2/0-12 AWG Al	20	24INT125B
125	6	12	E52977	(1) 2/0-#14 AWG Cu/Al	20	612INT125SRB
<b>Single-Phase Double Row Breaker Mounting—Aluminum Bus—120/240 Vac, Three-Wire</b>						
125	4	8	E8741	(1) 2/0-#14 AWG Cu/Al	20	48INT125B
125	6	12	E8741	(1) 2/0-#14 AWG Cu/Al	20	612INT125B
125	8	16	E8741	(1) 2/0-#14 AWG Cu/Al	20	816INT125B
125	12	812	E52977	(1) 2/0-#14 AWG Cu/Al	20	1212INT125B
125	12	24	E52977	(1) 2/0-#14 AWG Cu/Al	20	1224INT125B
125	16	24	E52977	(1) 2/0-#14 AWG Cu/Al	20	1624INT125B
125	20	24	E52977	(1) 2/0-#14 AWG Cu/Al	10	2024INT125B
125	24	24	E52977	(1) 2/0-#14 AWG Cu/Al	10	2424INT125B
200	8	16	E52977	(1) 300 kcmil-#1 AWG Cu/Al	20	816INT200B
200	12	24	E52977	(1) 300 kcmil-#1 AWG Cu/Al	20	1224INT200B
200	30	40	E52977	(1) 300 kcmil-#1 AWG Cu/Al	10	3040INT200B
200	42	42	E52977	(1) 300 kcmil-#1 AWG Cu/Al	10	4242INT225B
<b>Single-Phase Double Row Breaker Mounting—Copper Bus—120/240 Vac, Three-Wire</b>						
125	8	16	E5297	(1) 2/0-#14 AWG Cu/Al	20	816INT125BC
125	12	12	E5297	(1) 2/0-#14 AWG Cu/Al	20	1212INT125BC
200	12	24	E5297	(1) 300 kcmil-#1 AWG Cu/Al	20	1224INT200BC
<b>Three-Phase Double Row Breaker Mounting—Aluminum Bus—208Y/120 Vac, Four-Wire—240 Vac, Three-Wire—120/240 Vac, Four-Wire Delta</b>						
125	12	34	E52977	(1) 2/0-#8 AWG Cu/Al	10	1224INT3125B
150	18	36	E52977	(1) 300 kcmil-#2 AWG Cu/Al	10	1836INT3150B
150	24	42	E52977	(1) 300 kcmil-#2 AWG Cu/Al	10	2442INT3150B
200	30	42	E52977	(1) 300 kcmil-#2 AWG Cu/Al	10	3042INT3200B
225	42	42	E52977	(1) 300 kcmil-#2 AWG Cu/Al	10	4242INT3225B
<b>Three-Phase Double Row Breaker Mounting—Copper Bus—208Y/120 Vac, Four-Wire—240 Vac, Three-Wire—120/240 Vac, Four-Wire Delta</b>						
125	12	24	E52977	(1) 2/0-#8 AWG Cu/Al	10	1224INT3125BC
200	12	24	E52977	(1) 300 kcmil-#2 AWG Cu/Al	10	1224INT3200BC

**Classified Breakers**



**Product Description**

Eaton UL classified Replacement Circuit Breakers are available in both 3/4-inch Type CHQ and 1-inch Type CL, single- and two-pole configurations. These breakers are classified as direct replacements by Underwriters Laboratories. In addition to a UL listing, they also come with a 15-year warranty.

**Specified vs. UL Classified**

Specified breakers are listed by the manufacturer of the panelboard for use in a particular panel. This doesn't mean that the panelboard manufacturer produced the specified breaker; it merely means that the panelboard manufacturer has tested the breaker in the panel. In fact, through the years, Eaton has manufactured thousands of breakers for other panelboard manufacturers.

UL classified breakers are produced by one manufacturer for use in place of the breakers specified on the panelboard. Like specified breakers, UL classified breakers have been tested in the panels for which they are approved.

**Contents**

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**Testing**

Classified breakers are tested extensively in numerous General Electric®, Siemens®, Murray®, Thomas & Betts®, Square D®, and Crouse-Hinds® panels. The tests are conducted with witnesses from Underwriters Laboratories Inc. and involve short-circuit, temperature, and insertion/withdrawal applications. This level of testing ensures that the breakers meet identified standards and have been found suitable by UL for the specified purpose.

**Understanding Classified Breaker Terminology**

**Definitions**

Specified circuit breaker—each manufacturer lists the brands of circuit breakers that can be used in their panelboards. Often, manufacturers will not list competitors as specified, even though they are suitable replacements.

Classified circuit breaker—a breaker that is considered suitable, by a qualified third-party organization, for use in another manufacturer's panelboard.

Listed breaker—the listing of a circuit breaker is by an independent third party. Eaton classified breakers are listed by UL.

Labeled breaker—a breaker with a label affixed by an independent third party.

**Product Selection**



**Type CHQ Replacement Breakers for Square D Type QO Loadcenters**

10 kAIC, 120 and 120/240 Vac

CHQ120 CHQ230



**Type CHQ Classified Breakers 3/4-Inch (19.1 mm) per Pole 120 or 120/240 Vac, 10 kAIC**

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	 Single-Pole 120/240 Vac Requires One 3/4-Inch (19.1 mm) Space 10 per Shelf Carton Catalog Number		 Two-Pole 120/240 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces 5 per Shelf Carton Catalog Number	
		Catalog Number	Catalog Number		
15	(1) #14–8	CHQ115	CHQ215		
20	(2) #14–10	CHQ120	CHQ220		
25		CHQ125	CHQ225		
30		CHQ130	CHQ230		
35		CHQ135	CHQ235		
40		CHQ140	CHQ240		
45		CHQ145	CHQ245		
50		CHQ150	CHQ250		
60		—	CHQ260		

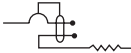

**Type CHQ Ground Fault and Arc Fault Replacement Breakers for Square D Type QO Loadcenters**

10 kAIC, 120 and 120/240 Vac

CHQ115GF CHQ220GF



**Type CHQ Ground Fault Breakers—5 Milliampere—3/4-Inch (19.1 mm) per Pole, 10 kAIC**

Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	 Single-Pole 120 Vac Requires One 3/4-Inch (19.1 mm) Space 10 per Shelf Carton Catalog Number		 Two-Pole 120/240 Vac Common Trip Requires Two 3/4-Inch (19.1 mm) Spaces 5 per Shelf Carton Catalog Number	
		Catalog Number	Catalog Number		
15	(1) #14–8	CHQ115GF	CHQ215GF		
20	(2) #14–10	CHQ120GF	CHQ220GF		
25		CHQ125GF	CHQ225GF		
30		CHQ130GF	CHQ230GF		
35		—	CHQ235GF		
40		—	CHQ240GF		
45		—	CHQ245GF		
50		—	CHQ250GF		

**Type CHQ Surge Arrester**

Catalog Number
CHQSA

# 1.4

## Loadcenters and Circuit Breakers

### Classified Circuit Breakers



1

#### Type CL Replacement Breakers for Square D HOMELINE, General Electric, Crouse-Hinds, Thomas & Betts, Murray and ITE®/Siemens Loadcenters

CL

#### Type CL Breakers, 1-Inch (25.4 mm) per Pole, 10 kAIC

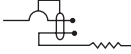


Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	 Single-Pole 120/240V Requires One 1-Inch (25.4 mm) Space 10 per Shelf Carton Catalog Number		 Two-Pole 120/240V Common Trip Requires Two 1-Inch (25.4 mm) Spaces 5 per Shelf Carton Catalog Number	
15	#14-4	CL115		CL215	
20	#14-4	CL120		CL220	
25	#14-4	CL125		CL225	
30	#14-4	CL130		CL230	
35	#14-4	CL135		CL235	
40	#14-4	CL140		CL240	
45	#14-4	CL145		CL245	
50	#14-4	CL150		CL250	

CL\_AF

#### Type CL Classified Arc and Ground Fault Breakers (5 Milliampere), 1-Inch (25.4 mm) per Pole, 10 kAIC





Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	 Single-Pole 120/240V Requires One 1-Inch (25.4 mm) Space 1 per Shelf Carton Catalog Number	
<b>Arc Fault Breakers</b>			
15	#14-4	CL115AF	
20	#14-4	CL115CAF	
20	#14-4	CL120AF	
20	#14-4	CL120CAF	
<b>Arc Fault/Ground Fault Breakers</b>			
15	#14-4	CL115AFGF	
20	#14-4	CL120AFGF	
<b>Ground Fault Breakers</b>			
15	#14-4	CL115GF	
20	#14-4	CL120GF	
30	#14-4	CL130GF	

CLR

#### Type CL Classified Latching Remote Control Smart Breakers™, 1-Inch (25.4 mm) per Pole, 10 kAIC



Ampere Rating	Wire Size Range Cu/Al 60°C or 75°C	 Single-Pole 120V Requires One 1-Inch (25.4 mm) Space 10 per Shelf Carton Catalog Number		 Two-Pole 120/240V Common Trip Requires Two 1-Inch (25.4 mm) Spaces 5 per Shelf Carton Catalog Number	
15	(2) #14-10	CLRP115		CLRP215	
20	(2) #14-10	CLRP120		CLRP220	
25	(1) #8-6	CLRP125		CLRP225	
30	(1) #8-6	CLRP130		CLRP230	

## Accessories

### CHQ Breaker Accessories

Description	Catalog Number
Breaker handle lock	CHLO

## Technical Data

### Arc Fault Application Notes

An arc fault circuit interrupter is a device intended to provide protection from the effects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when the arc fault is detected. As of January 1, 2002, the National Electrical Code (NEC) requires all branch circuits that supply 125V, single-phase, 15 and 20A receptacle outlets installed in dwelling unit bedrooms shall be protected by an arc fault circuit interrupter(s). This includes ceiling lighting (recessed, ceiling fans, etc.) as well as smoke detectors and all other bedroom outlets. The 2005 NEC introduced the application of the Combination Type AFCI for bedroom circuits required as of January 1, 2008. The 2008 NEC expands this application to other living areas.

### Ground Fault Application Notes

Single-pole GFCBs are designed for use in two-wire, 120 Vac circuits. Drawing on **Page 96** shows 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.

Drawings on **Page 96** illustrate typical wiring configurations for 120/240 Vac multiwire circuits.

Drawing on **Page 96** depicts 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.

# 1.4

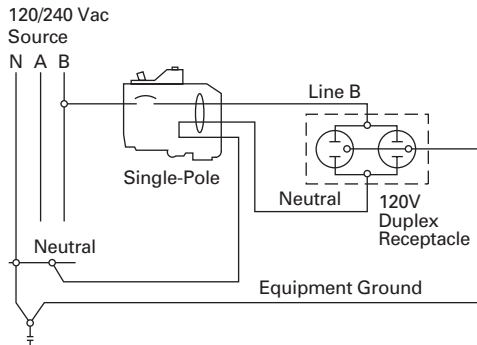
## Loadcenters and Circuit Breakers

Classified Circuit Breakers

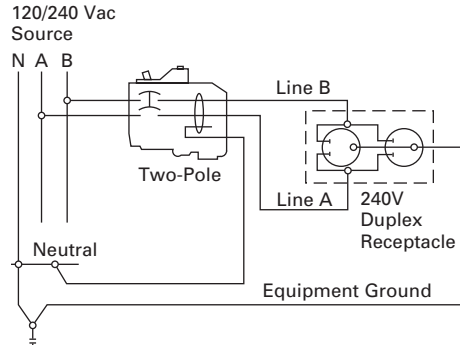
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#### Wiring Diagrams

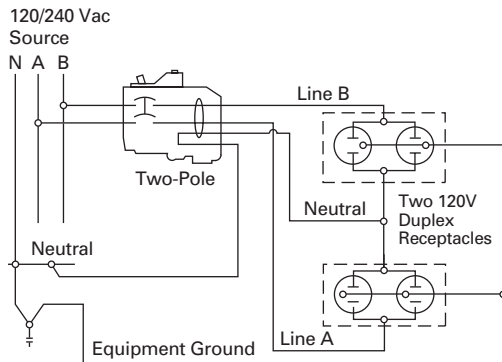
Single-Pole 120V Load Application Sourced by 120/240 Vac



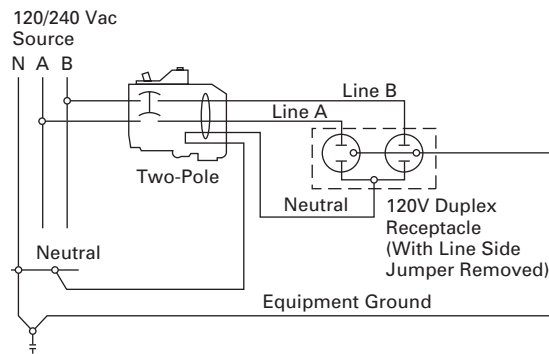
Two-Pole 240V Load Application Sourced by 120/240 Vac



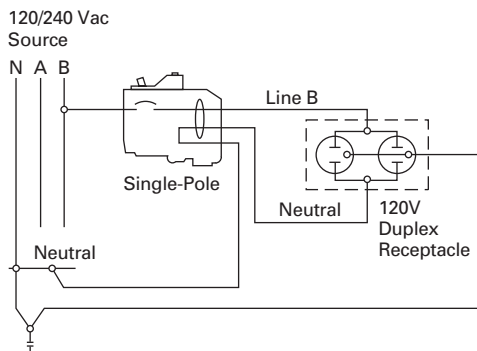
Two-Pole Shared Neutral with Multi-Duplex Receptacle Application



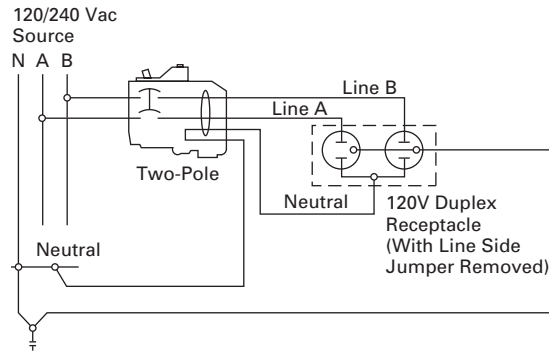
Two-Pole Shared Neutral with Duplex Receptacle Application



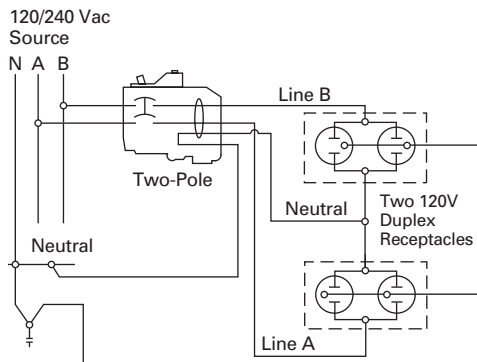
Single-Pole 120V Duplex Receptacle Application



Two-Pole 120V Duplex Receptacle Application



Two-Pole 120V Multi-Duplex Receptacle Application



Two-Pole 240V Duplex Receptacle Application

