Home 2 Flowood

Submittal for Approval

Negotiation Number

MH880916X6K3

Volume 1 of 1

Equipment:

Switchboards
Panelboards
Enclosed Control (NEMA)

Date: 1/18/2017

Main Table of Contents

Switchboards

Detail Bill of Material

Project Name: Home 2 Flowood
General Order No:
Negotiation No: MH880916X6K3
Alternate No: 0002

Item No.	Qty	Product	Description
	1	Switchboards	Pow-R-Line CSwitchboard, Front Access/ Front and Rear Align, Type 1, 208Y/120V 3-Phase 4-Wire, 3000 Aluminum, Minimum Interrupting Rating: 100kA, Bus Bracing Rating: 100kA

Designation MDP

Qty	List of Materials
1	Pow-R-Line C
1	Service Entrance Label
2	Structure Bus Bracing - 100 kA
1	3000 Amp AL Main Structure
31	Nameplate
1	Digitrip RMS520 LSI - Standard
1	Vertical Isol. Barrier (Service Entrance)
1	Switchboard ID Nameplate
1	3000 Amp AL Distribution Structure
21	Mechanical Terminals: (1) #6-300 kcmil
30	Thermal Mag Trip - Standard
2	Shunt Trip (48-127Vac)
1	3000A 3P Magnum SB Brkr SBS-C30 [Fixed-Manual], Trip 3000 A, RMS520 LSI, (8) 3/0-750 kcmil, Mechanical, Bottom
16	225A 3P [EDH 225A Frame], Trip 225 A, Thermal Mag, (1) #6-300 kcmil, Mechanical
4	225A 3P [EDH 225A Frame], Trip 225 A, Thermal Mag, (1) #4-4/0, Mechanical
5	200A 3P [EDH 225A Frame], Trip 200 A, Thermal Mag, (1) #6-300 kcmil, Mechanical
3	100A 3P [HFD 225A Frame], Trip 100 A, Thermal Mag, (1) #14-1/0, Mechanical
1	300A 3P [HKD 400A Frame], Trip 300 A, Thermal Mag, (1) 250-500 kcmil, Mechanical
1	300A 3P [HKD 400A Frame], Trip 300 A, Thermal Mag, (2) 2/0-250 kcmil, Mechanical

Eaton Selling Policy None applies.

All orders must be released for manufacture within 90 days of date of order entry. If approval drawings are required, drawings must be returned approved for release within 60 days of mailing. If drawings are not returned accordingly, and/or if shipment is delayed for any reason, the price of the order will increase by 1.0% per month or fraction there of for the time the shipment is delayed.

Switchboard General Information

Pow-R-Line C - Specifications

Quantity: 1

Alignment: Front Access/ Front and Rear Align

Service: 208Y/120V 3-Phase 4-Wire

Minimum Interrupt Rating: 100 kA

Bus Specifications

Bus Amps: 3000

Bus Bracing Rating: 100kA

Neutral Amps: 3000

Bus Material: Aluminum

Heat Test

Ground Bus Material: Aluminum .25 X 3.0 Ground Bus Bolted To Frame, (1) #6-350 kcmil Ground Lug

Incoming Information

Incoming Entry: Bottom

Incoming Location: Left

Incoming Qty & Size: Terminals, Mechanical, (8) 3/0-750 kcmil, Bottom

Structure Specifications

Service Entrance

Enclosure Type: Type 1

Nameplates: Mastic - White with Black letters

Enclosure properties

Struct #	Description/Modifications
1	Bottom incoming main device (Incoming Main Device/MLO Section) Vertical isolating barrier
2	50x chassis mounted feeders (Feeder Structure)

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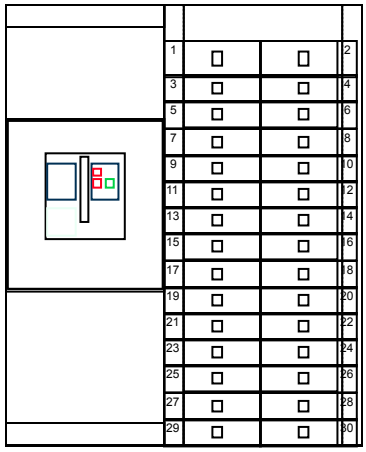
APPROVED BY:	DATE:	JOB NAME: Home 2 Flowood			
		DESIGNATION: MDP			
VERSION: 8.0.14.0		TYPE: Switchboards		DRAWING TYPE: CustAppr	
NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: DwgA	G.O.	ITEM	SHEET: 1 of 6



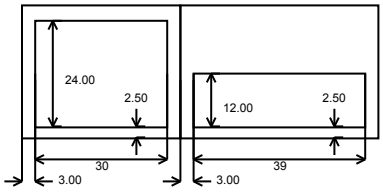
Front View

Struct	1	2 *
Depth	30	30
Width	36	45

Power Flow

Floor Plan
Rear

See 1A32043 For
Floor Plan Detail
Top/Bottom
Cable Exit



Total of 2 Structures, Total Weight of 2064 Weight-Lbs.
Total of 2 Structures, Total Width of 81 Inches

Structure	1	2				
Ship-Inches Ship-MM		81.00 2057				
Wdth-Inches Wdth-MM	36.00 914	45.00 1143				
Depth(Inner)-In. Depth(Inner)-MM	30.00 762	30.00 762				
Depth(Outer)-In. Depth(Outer)-MM	30.00 762	30.00 762				
Height-Inches Height-MM	90.00 2286	90.00 2286				
Weight-Lbs.(Est.) Weight-Kg.(Est.)	800 362	1264 573				

PREPARED BY	DATE		
TROY VANHOESEN	1/18/2017	**Eaton**	SumterSC
APPROVED BY	DATE	JOB NAME	Home 2 Flowood
		DESIGNATION	MDP
VERSION		TYPE	DRAWING TYPE
8.0.14.0		Switchboards	CustAppr

NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
MH880916X6K3-0002	0	DwgA			2 of 6

Switchboard Units Information

Str#	Unit	Description/Modifications	Nameplate
1			MDP 208Y/120V 3PH 4W 3000A 100K AIC
		Main Breaker - Ind Mtd-3000A 3P Magnum SB Brkr SBS-C30 [Fixed-Manual], Trip 3000A.RMS520 LSI, 100 % rated Terminals, Mechanical, (8) 3/0-750 kcmil, Bottom	MAIN BREAKER
2			
	1	Feeder Breaker - Chassis Mtd-300A 3P [HKD 400A Frame], Trip 300A.Thermal Mag Terminals, Mechanical, (1) 250-500 kcmil Neutral Terminal, (1) #4-500 kcmil	PANEL HAC
	2	Feeder Breaker - Chassis Mtd-300A 3P [HKD 400A Frame], Trip 300A.Thermal Mag Terminals, Mechanical, (2) 2/0-250 kcmil Neutral Terminal, (2) #6-350 kcmil	PANEL RF
	3	Feeder Breaker - Chassis Mtd-100A 3P [HFD 225A Frame], Trip 100A.Thermal Mag Terminals, Mechanical, (1) #14-1/0 Neutral Terminal, (1) #14-1/0	PANEL PL
	4	Feeder Breaker - Chassis Mtd-100A 3P [HFD 225A Frame], Trip 100A.Thermal Mag Terminals, Mechanical, (1) #14-1/0 Neutral Terminal, (1) #14-1/0	SPARE
	5	Feeder Breaker - Chassis Mtd-200A 3P [EDH 225A Frame], Trip 200A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL OL
	6	Feeder Breaker - Chassis Mtd-100A 3P [HFD 225A Frame], Trip 100A.Thermal Mag Terminals, Mechanical, (1) #14-1/0 Neutral Terminal, (1) #14-1/0	SPARE
	7	Feeder Breaker - Chassis Mtd-200A 3P [EDH 225A Frame], Trip 200A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL CA
	8	Feeder Breaker - Chassis Mtd-200A 3P [EDH 225A Frame], Trip 200A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil	PANEL LDY

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NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: DwgA	G.O.	ITEM	SHEET: 3 of 6

	Neutral Terminal, (1) #6-350 kcmil	
9	Feeder Breaker - Chassis Mtd-200A 3P [EDH 225A Frame], Trip 200A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL CB
10	Feeder Breaker - Chassis Mtd-200A 3P [EDH 225A Frame], Trip 200A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL K
11	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #4-4/0 Shunt Trip: 48-127Vac Neutral Terminal, (1) #6-350 kcmil	ELEVATOR #1
12	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #4-4/0 Shunt Trip: 48-127Vac Neutral Terminal, (1) #6-350 kcmil	ELEVATOR #2
13	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	PANEL 1A
14	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 3D
15	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #4-4/0 Neutral Terminal, (1) #6-350 kcmil	PANEL 1B
16	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 4A
17	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 2A

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18	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 4C
19	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 2C
20	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 4B
21	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 2B
22	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 4D
23	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 2D
24	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 5A
25	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 3A
26	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 5C

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VERSION: 8.0.14.0		TYPE: Switchboards		DRAWING TYPE: CustAppr	
NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: DwgA	G.O.	ITEM	SHEET: 5 of 6

27	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 3C
28	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 5B
29	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 3B
30	Feeder Breaker - Chassis Mtd-225A 3P [EDH 225A Frame], Trip 225A.Thermal Mag Terminals, Mechanical, (1) #6-300 kcmil Neutral Terminal, (1) #6-350 kcmil	PANEL 5D

PREPARED BY: TROY VANHOESEN	DATE: 1/18/2017	**Eaton**	SumterSC		
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		DESIGNATION: MDP			
VERSION: 8.0.14.0		TYPE: Switchboards		DRAWING TYPE: CustAppr	
NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: DwgA	G.O.	ITEM	SHEET: 6 of 6

Pow-R-Line C Switchboards

Meets NEMA Standard PB-2 and UL 891.

Construction Details

- 6000A main bus maximum
- Front accessible—main sections front- and/or side-access
- Front- and rear-access; main sections front- and/or side-access
- Feeder devices group-mounted
- Sections rear-aligned or front- and rear-aligned

Main Devices, Individually Mounted

- Molded-case circuit breakers, 400–2500A, fixed-mounted
- Insulated-case circuit breakers, Magnum SB, 800–5000A, fixed and drawout
- Air power circuit breakers, Magnum™ DS, 800–5000A, fixed or drawout
- Air power circuit breakers with current limiting fuses, Magnum DSL, 800–5000A
- Bolted pressure switches, 800–5000A, fixed
- Fusible switches, 400–1200A, fixed

Feeder Devices, Group-Mounted

- Molded-case circuit breakers, 15–1200A
- Fusible switches, 30–1200A

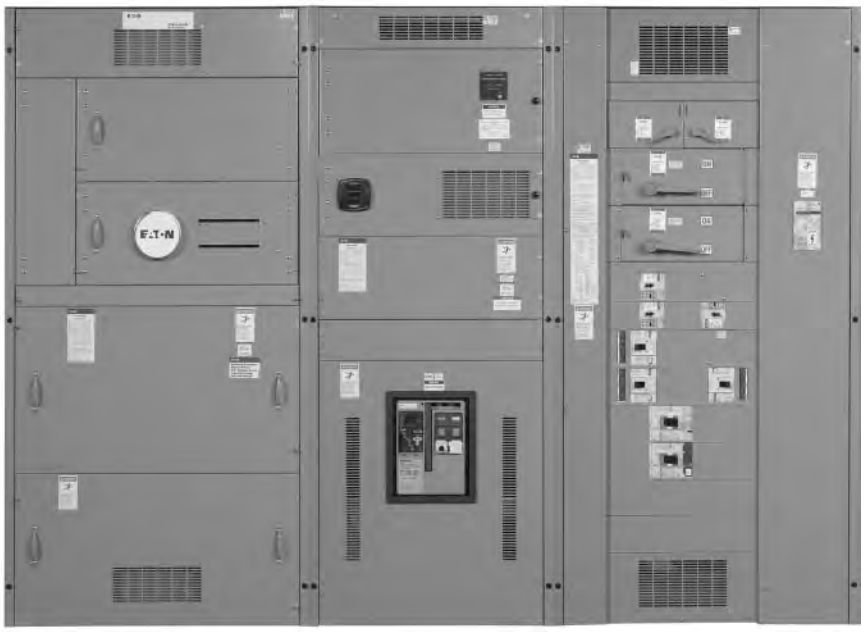
Feeder Devices, Individually Mounted

- Molded-case circuit breakers, 800–2500A, fixed
- Insulated-case circuit breakers, Magnum SB, 800–5000A, fixed and drawout
- Air power circuit breakers, DS and Magnum DS, 800–4000A, fixed and drawout
- Bolted pressure switches, 800–1600A, fixed

Selective Coordination

Selectively coordinated systems dictated by code and customer mandates may be achieved with Eaton switchboards to either 0.1 or 0.01 seconds as mandated by codes and/or customers. Refer to **Tab 1, Section 1.4** for additional details.

Note: For selection and layout guidelines, please reference **Page 21.1-1**.

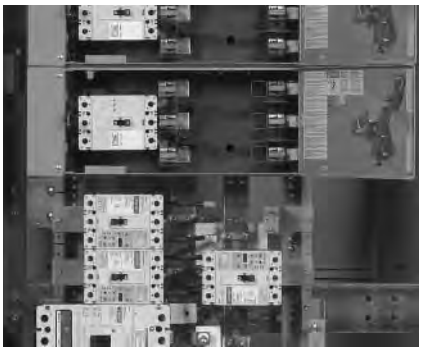


Pow-R-Line C Switchboard

For a complete product specification in CSI format, see Eaton's Product Specification Guide . . . . . **Section 16429**

Features

- Eaton's circuit breaker ratings up to 200 kAIC
- Trip units that integrate Eaton's Arcflash Reduction Maintenance System™ reduces potential arc flash available
- Integral ground fault protection available in electronic trip units from 15–5000A
- Electronic trip units that integrate zone selective interlocking capabilities available in molded-case, insulated-case and air power circuit breaker
- Available with circuit breakers and fusible switches on the same chassis

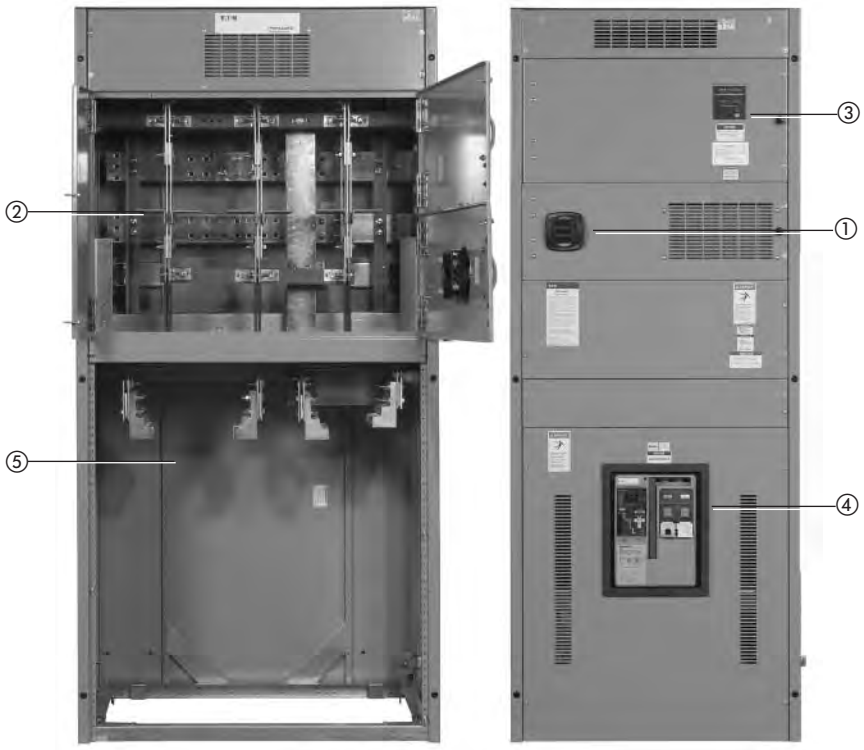


The Single Chassis Design Provides Device Flexibility

- UL listed and labeled. Meets NEC and NEMA standards
- Eaton microprocessor-based metering devices are standard when metering is specified. Conventional metering is available. IQ and Power Xpert devices can provide a communications capability. See **Tab 3**
- Optional integral surge protective device (SPD) is available in Pow-R-Line C switchboards, when specified. See **Tab 34**
- Aluminum, copper or silver-plated copper bus
- A full range of device modifications is available
- Available in NEMA Type 1 and 3R enclosures, UL listed

Modifications

- Ground fault protection on mains and distribution devices
- Coordination with other Eaton divisions for busway and transformer connections



Type 1 Pow-R-Line C Features

① Customer metering.
② Utility metering compartment.
③ Surge protective device.
④ Main breaker (Magnum SB).
⑤ Cable pull and termination space.

Table 21.0-1. Pow-R-Line C Group-Mounted Switchboards
Voltage: 240–480–600 Vac, 250 Vdc
Mains: 400–6000A

Main Device Type	Amperes	Short-Circuit Symmetrical Rating (kA)
Molded-case circuit breakers	400–2500	14–200
Insulated-case circuit breakers, Magnum SB	800–5000	30–100
Air power circuit breakers, Magnum DS		
Air power circuit breakers with CL fuses, DSL	800–5000	200
Bolted pressure switches	800–5000 ①	200
Fusible switches	400–1200	200
Main lugs only	400–6000	Rating determined by overcurrent protective device

Feeder Device Type	Amperes	Short-Circuit Rating (kA)
Molded-case circuit breakers	15–1200	10–200
Fusible switches	30–1200	200
Stacked—main with branch devices	400–2500	18–200
Magnum SB up to two high	800–2000	30–100
Magnum DS up to two high ②	800–2000	30–100

① 5000A bolted pressure switches are not UL listed.
② Third-party witness tested at 30 cycles.

Application Considerations and Definitions

Eaton's Pow-R-Line® family of distribution switchboards incorporates new design concepts that fit the ever-increasing need for applications on high short circuit systems, while retaining maximum flexibility, safety and convenience throughout the line.

Front Access

Front-access switchboards align at the rear, enabling them to be placed against a wall (Type Pow-R-Line C™ front accessible). If the main section is deeper than others, due to physical size of the main device, the necessary offset in lineup will occur in front, and the main section will be accessible from the side as well as from the front. Eaton also offers front accessible switchboards that align at the front and rear.

Rear Access

Rear-access switchboards align at the front and the rear. Bus maintenance and cable entry and exit require rear access. There are two types of rear accessible switchboards. Both types use the same incoming utility and/or main structures. The first type uses group-mounted feeder devices with panel construction (Type Pow-R-Line C rear accessible). The second type uses individually compartmentalized feeder devices with load side insulated bus bar extensions (Type Pow-R-Line *i*).

Individually Mounted

Larger overcurrent protective devices (OCPD) may be individually mounted. In most cases, this means that the OCPD is mounted vertically in the switchboard and is connected via bus bar. All insulated case circuit breakers, power air circuit breakers and bolted pressure contact switches are individually mounted. Molded-case circuit breakers 600A and above may be individually mounted when used as a main or as a feeder device feeding other OCPD within a section or adjacent sections.

Compartmentalized Feeder and Branch Devices

Compartmentalized molded-case circuit breakers and fusible switches provide additional isolation. Individually mounted molded-case circuit breakers and fusible switches through 1200A are available in a compartmentalized, rear-access, rear-connected switchboard. See Pow-R-Line *i* switchboards in this section for details.

Standard Switchboard Height

Standard Pow-R-Line switchboard height is 90.00 inches (2286.0 mm). Contact Eaton for special heights.

Group Mounting

Group-mounted circuit protective devices are an assembly of units mounted on a panelboard type chassis. Units may be molded-case breakers, fusible switches, customer metering and surge protective devices.

A main molded-case breaker or main fusible switch, within the sizes listed for panelboard design, can be included in the panel-mounted assembly in lieu of a separate, individually mounted unit.

Space Only for Future Devices Group-Mounted Construction

Where space only for future circuit protective devices is required, the proper space and a blank filler plate will be supplied. Connections and mounting hardware are not included.

Provision for Future Devices

Where provisions for future circuit protective devices are required, space for the device, corresponding vertical bus, device connectors and the necessary mounting hardware will be supplied.

Bus Bar System

Standard bus in the switchboards is tin-plated aluminum. Copper, silver-plated copper or tin-plated copper are also available.

Main bus and sub-main buses meet UL® and NEMA® standards for temperature rise on all Pow-R-Line switchboards. Special density rated bus is available.

Overcurrent Devices

To properly select and size overcurrent devices for use in a switchboard, the allowable temperature rise must be taken into account as to its effect on the tripping characteristics of the devices in question per UL 891.

Accordingly, the NEC® requires overcurrent devices to be rated not less than 125% of the continuous load they are protecting. To comply with this, an 80% derating factor must be used with all overcurrent devices such as molded-case breakers and FDPW fusible switches unless they are tested and listed for application at 100% of the rating. All Magnum type breakers and bolted pressure switches are 100% rated.

Short-Circuit Rating

Standard bus and connectors on all switchboards are rated for use on systems capable of producing up to 65,000A rms symmetrical short-circuit current at the incoming terminals.

Increased bus short-circuit ratings equal to that of connected switchboard devices, up to 200,000A rms symmetrical, are available in most Pow-R-Line C switchboards when approved main devices are installed. UL labeled switchboard sections are marked with their applicable short-circuit rating.

When air power circuit breakers are used as feeder devices in a switchboard, these devices may experience up to a 30-cycle (1/2 second) delay if the instantaneous setting is turned off. Eaton has qualified our low voltage switchboards when air power circuit breakers are used as feeders (and mains) to 30 cycles. This rating is not recognized under the UL 891 standard. However, Eaton has witness tested the structure bussing with a qualified National Recognized Testing Laboratory (NRTL) at 30 cycles (1/2 second) up to 100 kAIC symmetrical.

Provision for Busway Entrance and Exit

Busway connections to switchboard sections include cutout and drilling in the top of the switchboard with riser connections from the switchboard device or bus, up to the point where the bus duct enters the switchboard. No connections are furnished external to the switchboard.

In all transactions involving busway attached to switchboards, it is essential that information regarding orientation of the busway with respect to the front of the switchboard be supplied to the coordinating assembly plant.

On Pow-R-Line C switchboards, a solid bus bar is used to connect the bus duct to the individually mounted main device, main or sub-main switchboard bus, or vertical main bus of panel-mounted circuit protective device panels. **Busway fed by group-mounted branch devices are cable connected.**

Aluminum riser connections are standard. Copper- or silver-plated copper is available as an option.

Transitions

Transition structures are required for connecting switchboards to the secondary of power center transformer (fluid filled), motor control centers, and for other special switchboard configurations such as “L” or “U” shaped lineups. In some applications, an extra structure complete with connections is required; in others, where switchboard depth and space permit, only the connection conductors are required. Refer to Eaton for these applications.

Auxiliary Structures

These are normally mounted adjacent to service structures or distribution structures, and used where incoming service or feeder conductors require additional space or facilities not included in the standard switchboard, such as:

1. Mounted adjacent to a top connected service structure and used as a cable pull structure where service conductors are brought in underground. Auxiliary structures are the same depth and height as the service structure, and are wide enough to accommodate the incoming cables.
2. Mounted adjacent to a service structure and used as a bus transition compartment for running riser bus from the load-side of the service structure up to top outgoing bus duct connection when distribution structures are not required. Auxiliary structures are the same depth and height as service structures.

In addition to the above applications, auxiliary structures may be mounted adjacent to a distribution structure and used as a structure for lighting panel or other device that may be cable-connected to a branch circuit device in the distribution structure. Dimensions are compatible with the arrangements required.

Switchboards Used as Service Equipment

Service equipment is the electrical equipment that constitutes the main control and means of power cutoff the electric service (normally Power Company supply) brought into the building.

Where switchboards are to be used as service equipment, certain NEC and UL requirements apply that necessitate modifications not normally supplied in switchboards.

The following is a summary of the requirements that are pertinent to the application of a switchboard for service equipment:

A. A switchboard with main lugs only (no main disconnect) must be designed so that all circuits in the switchboard can be disconnected from the supply source by the operation of no more than six operating handles (breaker or switch).

Switchboard equipped with main disconnect devices are not subject to the above six disconnect limitation, as the entire board can be de-energized with the main disconnect device.

Ground fault protection of equipment must be provided for solidly grounded wye electrical services of more than 150V to ground, but not exceeding 600V phase-to-phase for each service disconnecting means rated 1000A or more.

B. For testing purposes, means are also required to disconnect the switchboard neutral bus from the grounded service neutral conductor (single-phase, three-wire; and three-phase, four-wire systems). To comply with this requirement, a removable link (solid bar) is provided in the switchboard neutral bus. This link is generally located near the point where the main feeders enter the switch-board or in the area of the main disconnect device where one is provided.

To further comply with NEC and UL requirements, a separate bonding strap is connected from the neutral bus to the switchboard frame. This bonding connection is located on the line side of the removable neutral link, maintaining a service ground to the switchboard frame when the test link is removed. See **Figure 21.0-1**.

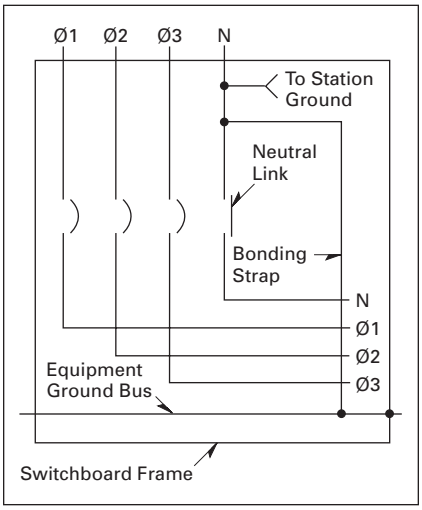


Figure 21.0-1. Neutral Link

UL labeling will clearly indicate service equipment listed switchboards.

Underwriters Laboratories Requirements and Labeling

The basic requirement for obtaining a UL label on a switchboard, is that all the component devices (breakers, switches, and so on) in the switchboard assembly are UL listed. In addition, the switchboard must comply with all applicable provisions of UL 891.

Today's modern electrical systems require that switchboards offer a wide selection of electrical devices, many of which do not fall within the scope of UL listed devices. Therefore, the conditions under which a switchboard may be labeled are limited.

Listed below are several important guidelines for consideration when a UL label is specified:

1. UL nameplates, where applicable, are supplied for each vertical structure rather than one common nameplate for the complete switchboard lineup. Where all of the component devices in the switchboard are UL listed and all applicable provisions of UL 891 are met, each of the switchboard sections may be labeled.
2. Individual vertical structures of a switchboard may be labeled where they comply with UL requirements, although other vertical structures in the same switchboard lineup may not meet the UL standards, and will not be labeled.
3. All Pow-R-Line C switchboards are UL labeled when all mounted devices are UL listed.

Alternate Power Source Capabilities

Multiple solutions are available to accommodate alternate power sources available. Due to the large number of customer and system requirements, details are not provided in this guide. Eaton offers solutions that include main-main configuration and main-tie-main configurations. Automatic transfer equipment, including UL 1008 listed transfer switches and other automatic transfer schemes, are available.

Automatic Transfer Equipment

For continuity of service, automatic transfer equipment between two incoming sources may be required. This equipment transfers the load upon failure of the normal (or preferred) source to the standby (or alternate) source. Upon restoration of the normal source, the load is automatically transferred back to it. To accomplish this, electrically operated main protective devices (and bus tie devices, if required) must be employed. Additional relays also are required to detect source voltage failure and to transfer control power, when required. A manual selector switch is usually provided to select the mode of operation—automatic or manual transfer.

Seismic Qualification

Refer to **Tab 1** for information on seismic qualification for this and other Eaton products.

Magnum Low Voltage Power Circuit Breakers for Global Application

Magnum low voltage power circuit breakers enable comprehensive solutions to meet and exceed the unique and wide-ranging requirements of today's global power distribution systems. This powerful circuit breaker offering is designed for ultimate custom configuration and application flexibility, with the needs of the power distribution equipment user and the electrical equipment manufacturer in mind.

Standards

Magnum DS circuit breakers meet or exceed all applicable requirements of ANSI Standards C37.13, C37.17, C37.50 and CSA.

See **Tab 20** for ANSI/UL 1558 low voltage drawout switchgear application considerations, including system voltage and frequency, continuous current ratings, ambient temperature, altitude, and other unusual environmental and operating conditions.

See **Tab 21** for UL 891 switchboard application considerations, ratings and layouts.

Three Product Families

Magnum consists of three product families; each provides specific rating features and approvals to optimize performance when applied in power distribution equipment and custom enclosures:

Magnum DS Low Voltage Power Circuit Breakers for ANSI/UL 1558 Rated Switchgear Applications

- Up to 635 Vac
- 200–6000 A continuous
- 42–200 kA interrupting

Magnum DS Low Voltage Power Circuit Breaker Family ANSI Rated for Switchgear Applications

Magnum SB Low Voltage Insulated-Case Circuit Breakers for UL 891 Switchboard Applications

- Up to 635 Vac
- 200–6000 A continuous
- 50–150 kA interrupting

Magnum SB Low Voltage Insulated-Case Circuit Breaker Family UL Rated for Switchboard Applications

Magnum IEC Rated Air Circuit Breakers for IEC Rated Switchboard Applications

- Up to 690 Vac
- 200–6300 A continuous
- 40–105 kA I_{cu}/I_{cs}

Magnum IEC Rated Low Voltage Air Circuit Breaker Family for IEC Switchboard Applications

For more information on Magnum IEC air circuit breakers, please visit **www.eaton.com/electrical**.

All Magnum Breaker Types—Features, Benefits and Functions

- **Interruption ratings up to 200 kA** with current limiting performance and low current let-through to reduce damaging energy to downstream equipment at high fault levels or with high short-time ratings for increased selectivity
- **Short-time ratings up to 130 kA** to maximize system coordination and selectivity
- **Four physical frame sizes** (narrow, standard, double narrow and double) to promote breaker application in compact modular enclosures
- **Continuous current ratings from 800–6000 A** with 100% rating at 40 °C and no derating on most ratings up to 50 °C in a properly sized and ventilated enclosure
- **Fixed breaker mounting configurations** with horizontal and optional vertical and front connected terminal connections
- **Drawout breaker mounting configurations** with cassette and optional safety shutters
- **Three- and four-pole breaker configurations**
- **Through-the-door design** for human interface with the breaker compartment door closed
- **Two-step stored energy mechanism** for manually and electrically operated breakers
- **Digitrip™ RMS Trip Unit family protection** with four models each providing increasing levels of protection and feature options for coordination, information and diagnostics:
  - Microprocessor-based rms sensing
  - Basic to programmable overcurrent protection and alarms
  - Local display for information, status and diagnostics
  - Ampere, voltage and power metering
  - Power quality, harmonics and waveform capture
  - Communications with translators to common protocols
  - Zone selective interlocking for improved coordination
  - Integral Arcflash Reduction Maintenance System™
  - Breaker health monitoring
- **Field-installable accessories** (UL listed) common across the breaker frames and designed to be easily installed in the field to service or modify the breaker at the point of use
- **Secondary terminal contacts** mounted at the top front of the breaker and away from the primary voltage areas for improved safety and access. Finger-safe terminal blocks accommodate ring-tongue or spade type terminals as standard

Through-the-Door Design for Human Interface with the Breaker Compartment Door Closed

High Technology Microprocessor-Based Digitrip RMS 1150+ Trip Units are Available with Advanced Features Like Programmable Overcurrent Settings, Power Metering, Power Quality and Communications

Breaker Features on Front Cover

The controls and indicators are functionally grouped on the breaker faceplate to optimize the human interface, visibility and ease of use. For maximum safety, a modern, through-the-door design permits access to the breaker levering system, trip unit, controls and indicators with the door closed.

① Mechanical trip flag pop-out indicator (optional)—red
Interlocked indicator requiring manual reset is also available

② Accessory viewing windows for:

- ❑ Shunt Trip Attachment (STA)
- ❑ Spring Release device (SR)
- ❑ Undervoltage Release (UVR) device or second STA

③ Digitrip RMS trip unit (Model 520M shown) protected by clear cover

④ Contact status indicators:

- ❑ OPEN—green
- ❑ CLOSED—red

⑤ Spring status indicators:

- ❑ Charged—yellow
- ❑ Discharged—white

⑥ Push OFF (open) pushbutton—red

⑦ Push ON (close) pushbutton—green

⑧ Manual spring charging handle for manually charging the stored energy springs

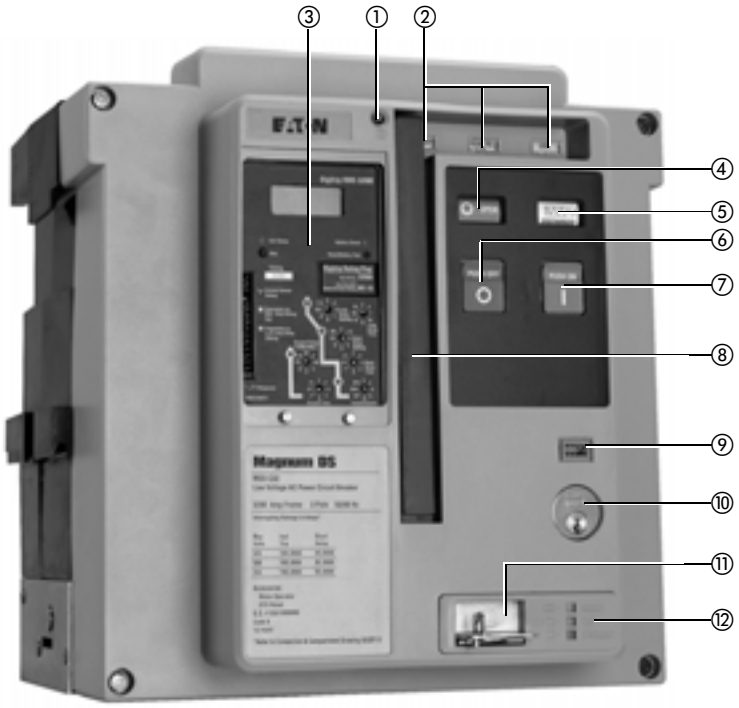
⑨ Mechanical operations counter (optional)

⑩ Key off lock (optional)

⑪ Padlockable levering device shutter for drawout breakers

⑫ Color-coded position indicator for drawout breakers:

- ❑ CONNECT—red
- ❑ TEST—yellow
- ❑ DISCONNECT—green



Magnum DS Drawout Breaker

Accessory Viewing Windows Visibly Confirm the Breaker Shunt Trip, Spring Release, UVR Installation and Their Control Voltage Rating

Drawout Breaker Levering Can be Accomplished with the Compartment Door Closed without the Need for a Special Levering Tool

Through-the-Door Design for Human Interface with the Breaker Compartment Door Closed, for Example, Manually Charging the Stored Energy Springs

Breaker Internal Features

Magnum circuit breakers are designed for ease of access for inspection, modification and maintenance at the point of use. The breaker front cover is easily removed with four captive bolts, revealing the modular internal breaker features.

① Secondary terminal points for internal standardized breaker wiring connections

② Breaker accessory mounting deck with three positions for mounting:

- ❑ Shunt Trip Attachment (STA)
- ❑ Spring Release device (SR)
- ❑ Undervoltage Release (UVR) device or second STA

③ Digitrip RMS Trip Unit (Model 1150+ shown)

④ Spring charging motor (optional) for electrically charging the stored energy springs

⑤ Manual spring charging handle for manually charging the stored energy springs

⑥ Padlockable levering device shutter for drawout breakers

⑦ Color-coded position indicator for drawout breakers:

- ❑ CONNECT—red
- ❑ TEST—yellow
- ❑ DISCONNECT—green

⑧ Secondary contact blocks for connection to external cell control wiring

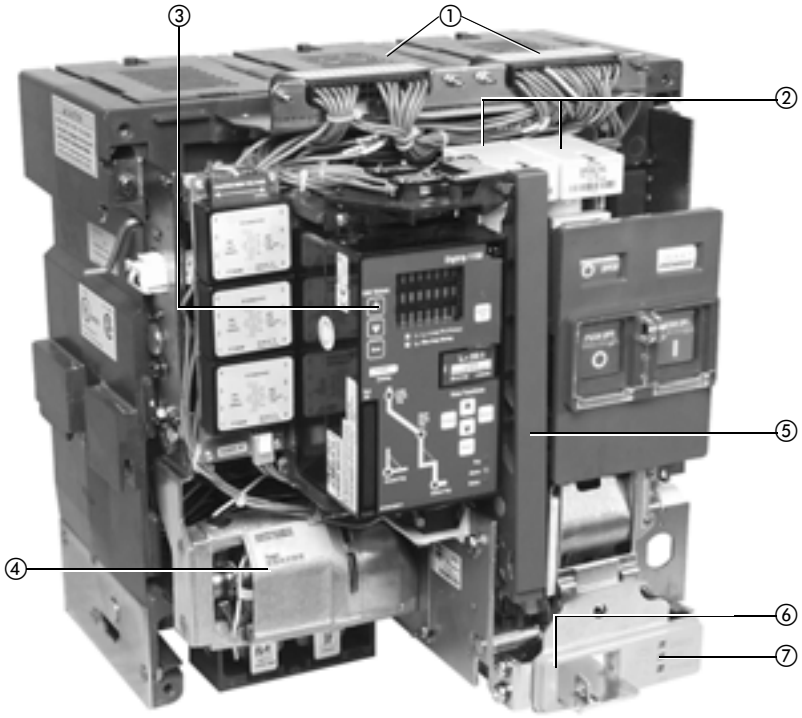
⑨ Removable arc chute covers for easy access to breaker main contacts

⑩ Primary finger cluster disconnecting contacts for drawout breaker are mounted on the breaker element for ease of access for inspection and maintenance

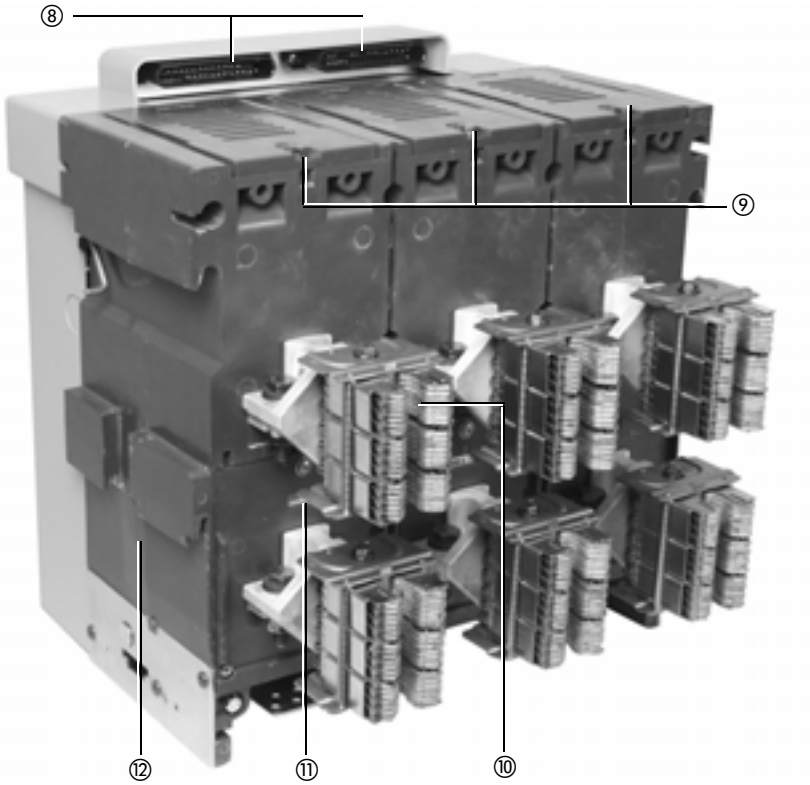
Note: Some competitors mount the primary finger clusters inside the cell, requiring shutdown of the switchgear for inspection and maintenance.

⑪ Current sensor viewing windows to view and confirm breaker sensor rating

⑫ Rigid frame housing (thermoset composite resin) providing increased strength and durability



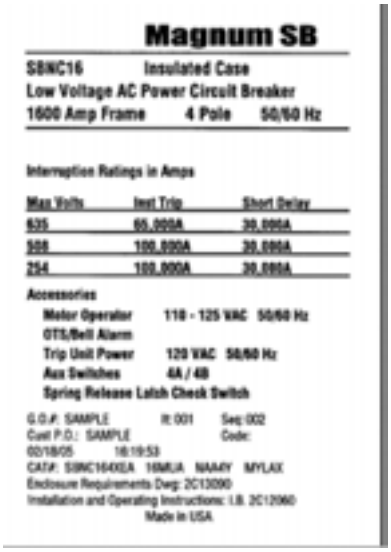
Magnum Drawout Breaker Front View with Front Cover Removed Showing Easy Access to the Breaker Internal Devices



Magnum Drawout Breaker Rear View Showing Primary Disconnecting Finger Clusters Mounted on the Breaker for Ease of Inspection

Magnum SB Low Voltage Insulated-Case Circuit Breakers

Magnum SB Low Voltage Insulated-Case Circuit Breakers are Designed for the Performance and Economic Requirements of UL 891 Switchboards



Magnum SB

SBNC16 Insulated Case
Low Voltage AC Power Circuit Breaker
1600 Amp Frame 4 Pole 50/60 Hz

Interruption Ratings in Amps

Max Volts	Inst Trip	Short Delay
635	65,000A	30,000A
508	100,000A	30,000A
254	100,000A	30,000A

Accessories
Motor Operator 110 - 125 VAC 50/60 Hz
OTS/Bell Alarm
Trip Unit Power 120 VAC 50/60 Hz
Aux Switches 4A / 4B
Spring Release Latch Check Switch

G.O.#: SAMPLE R: 001 Seq: 002
Cust P.O.: SAMPLE Code:
02/18/05 16:19:53
CAT#: SBNC164XIA 16MIJA NAMY MYLAX
Enclosure Requirements Dwg: 2C13090
Installation and Operating Instructions: I.B. 2C12060
Made in USA

Typical Magnum SB Low Voltage Insulated-Case Circuit Breaker Nameplate

Magnum SB is a low voltage insulated-case circuit breaker family designed for the performance and economic requirements of UL 891 switchboards.

- Magnum SB insulated-case circuit breakers have Interruption ratings up to 100 kA at 635 Vac with continuous current ratings up to 6000 A
- Magnum SB insulated-case circuit breakers have lighter-duty short-time current ratings and fixed internal instantaneous trips on most ratings, which is characteristic of UL 489 molded-case breakers commonly used in UL 891 switchboards. This provides for greater economy and excellent coordination and selectivity for most commercial applications
- Fixed internal instantaneous trips are included on all SB insulated-case circuit breakers rated 3200 A and below to provide an extra safety factor by reducing the energy let-through to downstream circuits at the maximum instantaneous trip point and to facilitate feeder circuit breaker protection in UL 891 switchboards with 3-cycle bus bracing
- Magnum SBSE current limiting power circuit breakers have 150 kA interrupting ratings at 480 Vac with continuous current ratings up to 5000 A. The short-time current rating is 30 kA for standard frame and 50 kA for double frame breakers

UL and ANSI Test Certifications

Magnum SB meets or exceeds the applicable ANSI, NEMA, UL and CSA standards, including:

- ANSI C37.13 (low voltage AC power circuit breakers used in enclosures)
- ANSI C37.16 (preferred ratings, related requirements, and application recommendations for low voltage power circuit breakers and AC power circuit breakers)
- ANSI C37.17 (trip devices for AC and general purpose DC low voltage power circuit breakers)
- ANSI C37.50 (test procedures for low voltage AC power circuit breakers used in enclosures)
- UL 1066 (standard for low voltage AC and DC power circuit breakers used in enclosures)
- NEMA SG3 (this standard adopts ANSI C37.16 in its entirety)

Comprehensive Enclosure Solutions

Magnum SB has proven performance in Eaton manufactured switchboards with the following test certifications:

- UL 891 (Drawout Magnum SB and Pow-R-Line C low voltage switchboards)
- UL, CSA 22.2.31 low voltage assemblies

Approvals

- UL listed: Magnum SB breaker UL File E52096 and cassette UL File E204565

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Magnum SB Switchboard Class Insulated-Case

Magnum SB Low Voltage Insulated-Case Circuit Breaker Family UL Rated for Switchboard Applications

Table 26.1-5. Magnum SB Switchboard Class Insulated-Case Low Voltage Air Circuit Breakers

Frame Amperes	Breaker Type Catalog Number	Frame Type	rms Symmetrical Current Ratings kA 50/60 Hz ①					Poles Available	Available Current Sensor and Rating Plugs for Digitrip RMS Trip Unit (Establishes Breaker I_n Rating)
			Interrupting at 254 Vac	Interrupting at 508 Vac	Interrupting at 635 Vac	Short-Time Withstand Rating	Fixed Internal Instantaneous Trip		
800	SBN-508	Narrow	50	50	35	20	18 x I_n	3, 4	200, 250, 300, 400, 600, 800
	SBN-608	Narrow	65	65	42	20	18 x I_n	3, 4	
	SBN-C08	Narrow	100	100	65	20	18 x I_n	3, 4	
	SBS-608	Standard	65	65	65	20	18 x I_n	3, 4	
	SBS-808	Standard	85	85	85	20	18 x I_n	3, 4	
	SBS-C08	Standard	100	100	85	20	18 x I_n	3, 4	
	SBS-H08	Standard	130	130	130	20	18 x I_n	3	
	SBS-E08 ②③	Standard	200	150	65	30	30	3	
1200	SBN-512	Narrow	50	50	35	25	18 x I_n	3, 4	200, 250, 300, 400, 600, 800, 1000, 1200
	SBN-612	Narrow	65	65	42	25	18 x I_n	3, 4	
	SBN-C12	Narrow	100	100	65	25	18 x I_n	3, 4	
	SBS-612	Standard	65	65	65	25	18 x I_n	3, 4	
	SBS-812	Standard	85	85	85	25	18 x I_n	3, 4	
	SBS-C12	Standard	100	100	85	25	18 x I_n	3, 4	
	SBS-H12	Standard	130	130	130	25	18 x I_n	3	
	SBS-E12 ②	Standard	200	150	65	30	30	3	
1600	SBN-516	Narrow	50	50	35	30	18 x I_n	3, 4	200, 250, 300, 400, 600, 800, 1000, 1200, 1600
	SBN-616	Narrow	65	65	42	30	18 x I_n	3, 4	
	SBN-C16	Narrow	100	100	65	30	18 x I_n	3, 4	
	SBS-616	Standard	65	65	65	30	18 x I_n	3, 4	
	SBS-816	Standard	85	85	85	30	18 x I_n	3, 4	
	SBS-C16	Standard	100	100	85	30	18 x I_n	3, 4	
	SBS-H16	Standard	130	130	130	30	18 x I_n	3	
	SBS-E16 ②	Standard	200	150	65	30	30	3	
2000	SBN-620	Narrow	65	65	65	35	18 x I_n	3, 4	200, 250, 300, 400, 600, 800,
	SBN-C20	Narrow	100	100	65	35	18 x I_n	3, 4	
	SBS-620	Standard	65	65	65	35	18 x I_n	3, 4	1000, 1200, 1600, 2000
	SBS-820	Standard	85	85	85	35	18 x I_n	3, 4	
	SBS-C20	Standard	100	100	85	35	18 x I_n	3, 4	
	SBS-H20	Standard	130	130	130	35	18 x I_n	3	
	SBS-E20 ②	Standard	200	150	65	30	30	3	
2500	SBS-625	Standard	65	65	65	45	18 x I_n	3, 4	200, 250, 300, 400, 600, 800, 1000, 1200, 1600, 2000, 2500
	SBS-825	Standard	85	85	85	45	18 x I_n	3, 4	
	SBS-C25	Standard	100	100	85	45	18 x I_n	3, 4	
	SBS-H25	Standard	130	130	130	45	18 x I_n	3	
	SBS-E25 ②	Double	200	150	④	50	50	3	

① Interrupting ratings shown based on breaker equipped with integral Digitrip RMS trip unit. These interruption ratings are based on the standard duty cycle consisting of an open operation, a 15 second interval and a close-open operation, in succession, with delayed tripping in case of short-delay devices. The standard duty cycle for short time ratings consists of maintaining the rated current for two periods of 1/2 seconds each, with a 15 second interval of zero current between the two periods.

② Magnum SBSE current limiting power circuit breaker with fast opening contacts.

③ Not released.

④ Product to be tested. Contact Eaton for product rating.

Table 26.1-5. Magnum SB Switchboard Class Insulated-Case Low Voltage Air Circuit Breakers (Continued)

Frame Amperes	Breaker Type Catalog Number	Frame Type	rms Symmetrical Current Ratings kA 50/60 Hz ①					Poles Available	Available Current Sensor and Rating Plugs for Digitrip RMS Trip Unit (Establishes Breaker I_n Rating)
			Interrupting at 254 Vac	Interrupting at 508 Vac	Interrupting at 635 Vac	Short-Time Withstand Rating	Fixed Internal Instantaneous Trip		
3000	SBS-630	Standard	65	65	65	50	18 x I_n	3, 4	200, 250, 300, 400, 600, 800, 1000, 1200, 1600, 2000, 2500, 3000
	SBS-830	Standard	85	85	85	50	18 x I_n	3, 4	
	SBS-C30	Standard	100	100	85	50	18 x I_n	3, 4	
	SBS-H30	Standard	130	130	130	50	18 x I_n	3	
	SBS-E30 ②	Double	200	150	④	50	50	3	
4000	SBS640	Double	65	65	65	65	18 x I_n	3, 4	2000, 2500, 3000, 4000
	SBN640	Double Narrow	65	65	65	65	18 x I_n	3, 4	
	SBS-840	Double	85	85	85	72	18 x I_n	3, 4	
	SBS-C40	Double	100	100	100	72	18 x I_n	3, 4	
	SBS-H40	Double	130	130	130	72	18 x I_n	3	
	SBN-840	Double Narrow	85	85	65	72/65	18 x I_n	3, 4	
	SBN-C40	Double Narrow	100	100	65	72/65	18 x I_n	3, 4	
	SBS-E40 ②	Double	200	150	④	50	50	3, 4	
5000	SBS-850	Double	85	85	85	85	18 x I_n	3	2500, 3000, 4000, 5000
	SBS-C50	Double	100	100	100	90	18 x I_n	3, 4	
	SBS-H50	Double	130	130	130	90	18 x I_n	3	
	SBS-E50 ②③	Double	200	150	④	50	50	3	
6000	SBS-C60 ③	Double	100	100	100	100	18 x I_n	3, 4	3000, 4000, 5000, 6000
	SBS-H60	Double	130	130	130	100	18 x I_n	3	

① Interrupting ratings shown based on breaker equipped with integral Digitrip RMS trip unit. These interruption ratings are based on the standard duty cycle consisting of an open operation, a 15 second interval and a close-open operation, in succession, with delayed tripping in case of short-delay devices. The standard duty cycle for short time ratings consists of maintaining the rated current for two periods of 1/2 seconds each, with a 15 second interval of zero current between the two periods.

② Magnum SBSE current limiting power circuit breaker with fast opening contacts.

③ Breaker applied in a tested fan cooled enclosure.

④ Product to be tested. Contact Eaton for product rating.

Breaker-Mounted Options

Magnum breakers are available with a comprehensive array of factory-installed breaker options to enable configured-to-order solutions for specified customer requirements. Field option kits are available to provide easy service, modification and customization of the breaker at the point of use.

- **Shunt trip device** (**ST**). Provides for remote electrically controlled breaker opening when energized by a rated voltage input
- **Spring charge motor (MOT)**. Charges the breaker closing springs automatically, facilitating remote or local closing. The motor assembly includes its own cut-off switch that changes state at the end of the charging cycle. This contact can be wired out for external indication
- **Spring release device** (**SR**). Provides for remote electrically controlled breaker closing when its coils are energized by a rated voltage input
- **Undervoltage release** (**UVR**). Trips the breaker when an existing voltage signal is lost or falls below an established threshold
- **Auxiliary switch**. Up to 6a/6b auxiliary individual dedicated contacts are available for customer use to indicate if the breaker is in the OPEN or CLOSE position
- **Mechanical trip indicator flag** ①. The red trip indicator flag pops out to provide local visual indication when the Digitrip RMS trip unit acts to trip the breaker on an overcurrent condition. Available in two options: an interlocked version that mechanically locks out the breaker until the indicator is manually reset and a non-interlocked version for indication only
- **Bell alarm/overcurrent trip switch** ① **(OTS)**. Provides two Form C contacts that change state when the Digitrip RMS trip unit acts to trip the breaker. The contacts are available for external indication or customer use and are manually reset by the mechanical trip indicator
- **Padlockable pushbutton cover**. Permits padlocking hinged cover plates to block access to the PUSH ON and PUSH OFF buttons on the breaker faceplate
- **Mechanical operations counter**. Records mechanical operations of the breaker over its installed life
- **Key off lock provisions**. Enables mounting of a single cylinder Kirk®, Castell or Ronis Key Lock to lock the breaker in the OPEN position
- **Latch check switch**. Provides one Form C contact that changes state when the breaker is ready to close. Can be wired to the spring release device for fast transfer applications or wired for external ready-to-close indication

Shunt Trip, Spring Release and Undervoltage Release Device Installed on Accessory Deck

Auxiliary Switches Come in Modular 2a/2b Contact Stages Providing up to 6a/6b Dedicated Contacts

Mechanical Trip Indicator with Bell Alarm (OTS) Switches Mounted ①

① For the Digitrip RMS 1150+ trip unit, other protective functions, if programmed, will cause the OTS and mechanical trip indicator flag to operate.

Table 26.1-6. Digitrip Trip Units for Magnum DS and SB ANSI/UL Rated Power Circuit Breakers

					
Trip Unit Type		**Digitrip 520**	**Digitrip 520M**	**Digitrip 520MC**	**Digitrip 1150+** ①
Ampere range Interrupting rating at 480 V rms sensing		200–6000 A 42–200 kA Yes	200–6000 A 42–200 kA Yes	200–6000 A 42–200 kA Yes	200–6000 A 42–200 kA Yes
Protection and Coordination					
Protection	Ordering options Fixed rating plug (I_n) Overtemperature trip	LI, LSI, LSIG Yes Yes	LSI, LSIG, LSIA Yes Yes	LSI, LSIG, LSIA Yes Yes	LSI, LSIG, LSIA Yes Yes
Long delay protection (L)	Long delay pickup Long delay time I^2t at 6 x I_r Long delay time I^4t IEEE curves	0.4–1.0 x (I_n) 2–24 seconds No No	0.4–1.0 x (I_n) 2–24 seconds No No	0.4–1.0 x (I_n) 2–24 seconds No No	0.4–1.0 x (I_n) 2–24 seconds 1–5 seconds Yes
	Long delay thermal memory High load alarm	Yes No	Yes No	Yes No	Yes 0.5–1.0 x (I_r)
Short delay protection (S)	Short delay pickup Short delay time I^2t at 8 x I_r Short delay time flat Short delay time ZSI	200–1000% x (I_r) and M1 100–500 ms 100–500 ms Yes	200–1000% x (I_r) and M1 100–500 ms 100–500 ms Yes	200–1000% x (I_r) and M1 100–500 ms 100–500 ms Yes	200–1000% x (I_r) and M1 100–500 ms 100–500 ms Yes
Instantaneous protection (I)	Instantaneous pickup Making current release Off position	200–1000% x (I_n) and M1 Yes LSI and LSIG	200–1000% x (I_n) and M1 Yes Yes	200–1000% x (I_n) and M1 Yes Yes	200–1000% x (I_n) and M1 Yes Yes
Ground fault protection (G) ②	Ground fault alarm Ground fault pickup Ground fault delay I^2t at 0.625 x I_n	No 25–100% x (I_n) 100–500 ms	Yes 25–100% x (I_n) 100–500 ms	Yes 25–100% x (I_n) 100–500 ms	Yes 24–100% x (I_n) 100–500 ms
	Ground fault delay flat Ground fault ZSI Ground fault thermal memory	100–500 ms Yes Yes	100–500 ms Yes Yes	100–500 ms Yes Yes	100–500 ms Yes Yes
Disable ground fault protection		No	No	No	No
Neutral protection (N)		Model LSI	Model LSI	Model LSI	Model LSI
System Diagnostics					
Cause-of-trip LEDs Magnitude of trip information		Yes No	Yes Yes	Yes Yes	Yes Yes
Remote signal contacts Programmable contacts		No No	Yes No	Yes No	Yes Yes
System Monitoring					
Digital display Current (%) full scale sensor		No No	4-character LCD Yes ±2%	4-character LCD Yes ±2%	24-character LED Yes ±1%
Voltage (%) L to L Power and energy (%) Apparent power kVA and demand		No No No	No No No	No No No	Yes ±1% Yes ± 2% Yes
Reactive power kVAR Power factor Crest factor		No No No	No No No	No No No	Yes Yes Yes
Power quality—harmonics % THD, waveform capture		No No	No No	No No	Yes Yes
System Communications					
Type Power supply in breaker		No N/A	No Optional	INCOM Standard	INCOM/TripLink Standard
Additional Features					
Trip log (three events) Electronic operations counter		No No	No No	No No	Yes Yes
Testing method ③ Waveform capture		Test set No	Test set No	Test set No	Integral and test set Yes
Arcflash Reduction Maintenance System Breaker health monitor Protective relay functions		No No No	No No No	Yes No No	Yes Yes Yes ①

① Over and undervoltage alarm or trip, over and underfrequency alarm or trip, voltage unbalance alarm or trip, reverse power trip, and phase rotation alarm are included.

② 1200 A maximum ground fault setting per UL/NEC®.

③ Test set for secondary injection.

Legend: I_n = Rating Plug and Sensor Rating.
I_r = Long Delay Pickup setting.

Table 26.1-7. Magnum DS and SB Breaker Control Device Application Guide—Vdc

Breaker Control Device Nominal Voltage		24 Vdc	32 Vdc	48 Vdc	125 Vdc	250 Vdc
Shunt Trip (ST)	Trip circuit		—			
Operational voltage range	70–110%	17–26 Vdc		34–53 Vdc	77–138 Vdc	154–275 Vdc
Power consumption (inrush)	(required for 35 ms)	250 watts		250 watts	450 watts	450 watts
Opening time	Seconds	35 ms		35 ms	35 ms	35 ms
Spring Release (SR)	Close circuit		—			
Operational voltage range	70–110%	17–26 Vdc		34–53 Vdc	77–138 Vdc	154–275 Vdc
Power consumption (inrush)	(required for 200 ms)	250 watts		250 watts	450 watts	450 watts
Closing time	Seconds	35 ms		35 ms	35 ms	35 ms
Spring Charge Motor (MOT)			—			
Operational voltage range	85–110% voltage	20–26 Vdc		41–53 Vdc	94–138 Vdc	187–275 Vdc
Amps (running)	Running	16.0 A		7.5 A	3.0 A	1.3 A
Amps (inrush)	% of running	200%		600%	600%	600%
Power consumption		400 watts		400 watts	400 watts	350 watts
Charging time	Seconds	2.5 sec		2.5 sec	2.5 sec	2.5 sec
Undervoltage Release (UVR)						
Operational voltage range	85–110% voltage	20–26 Vdc	27–35 Vdc	41–53 Vdc	94–138 Vdc	187–275 Vdc
Drop-out voltage range	30–60% voltage	7–14 Vdc	10–19 Vdc	14–29 Vdc	33–75 Vdc	66–150 Vdc
Power consumption (inrush)	Required for 200 ms	250 watts	275 watts	275 watts	450 watts	450 watts
Power consumption (continuous)	Required for 400 ms	18 watts	15 watts	18 watts	10 watts	10 watts
Opening time	Seconds	70 ms	70 ms	70 ms	70 ms	70 ms
Auxiliary Switches			—			
Minimum load						
Contact rating	Inductive load	0.5 A		0.5 A	0.5 A	0.25 A

Table 26.1-8. Compact Spring Charge Motor

Breaker Control Device Nominal Voltage		24 Vdc	48 Vdc	110–125 Vdc	220–250 Vdc	110–127 Vac	208–240 Vac	208–277 Vac
Spring Charge Motor (MOT)								
Operational voltage range	85–110% voltage	20–26 Vac	41–53 Vac	94–138 Vac	187–275 Vac	94–140 Vac	177–264 Vac	177–305 Vac
Amps (running)	Running	6.0 A	3.0 A	1.0 A	0.6 A	1.0 A	0.75 A	1.10 A
Amps (inrush)	% of running	600%	600%	1200%	800%	600%	667%	500%
Power consumption	Watts or VA	150 VA	150 VA	150 VA	150 VA	150 VA	180 VA	300 VA
Charging time	Seconds	5.5 sec	5.5 sec	5.5 sec	5.5 sec	5.5 sec	5.5 sec	3.5 sec

Table 26.1-9. Magnum DS and SB Breaker Control Device Application Guide—Vac

Breaker Control Device Nominal Voltage		120 Vac	240 Vac	415 Vac	480 Vac	600 Vac
Shunt Trip (ST)	Trip circuit			—	—	—
Operational voltage range	70–110%	77–140 Vac	146–264 Vac			
Power consumption (inrush)	(Required for 35 ms)	450 VA	450 VA			
Opening time	Seconds	35 ms	35 ms			
Spring Release (SR)	Close circuit			—	—	—
Operational voltage range	70–110%	77–140 Vac	146–264 Vac			
Power consumption (inrush)	(Required for 200 ms)	450 VA	450 VA			
Closing time	Seconds	35 ms	35 ms			
Spring Charge Motor (MOT)				—	—	—
Operational voltage range	85–110% voltage	93–140 Vac	177–264 Vac			
Amps (running)	Running	2.0 A	1.0 A			
Amps (inrush)	% of running	600%	600%			
Power consumption	Watts or VA	250 VA	250 VA			
Charging time	Seconds	5 sec	5 sec			
Undervoltage Release (UVR)						
Operational voltage range	85–110% voltage	94–140 Vac	177–264 Vac	323–457 Vac	408–528 Vac	510–660 Vac
Drop-out voltage range	30–60% voltage	33–76 Vac	62–144 Vac	114–249 Vac	144–288 Vac	180–360 Vac
Power consumption (inrush)	Required for 200 ms	450 VA	400 VA	480 VA	400 VA	400 VA
Power consumption (continuous)	Required for 400 ms	10 VA	10 VA	10 VA	10 VA	10 VA
Opening time	Seconds	70 ms	70 ms	70 ms	70 ms	70 ms
Auxiliary Switches				—	—	—
Minimum load						
Contact rating	Inductive load	10 A	10 A			

Legend:

LS	Limit Switch for Closing Spring
MOT	Motor for Spring Charging
ST	Shunt Trip ①
SR	Spring Release
UVR	Undervoltage Release
OTS	Overcurrent Trip Switch

Description of Operation:

1 — Motor is energized through LS contact.
2 — Motor runs and charges closing spring.
3 — When closing spring is fully charged, LS contacts change state.
4 — Close contacts energize SR coil.
5 — When breaker closes, "b" opens.
6 — LS contacts change state and motor recharges closing springs.

* Contacts shown for breaker open (not fully charged), not tripped.

- - - - Dotted line denotes Magnum Breaker.

① Continuous Duty Shunt Trip also available that eliminates the requirement for the "a" contact cutout switch.

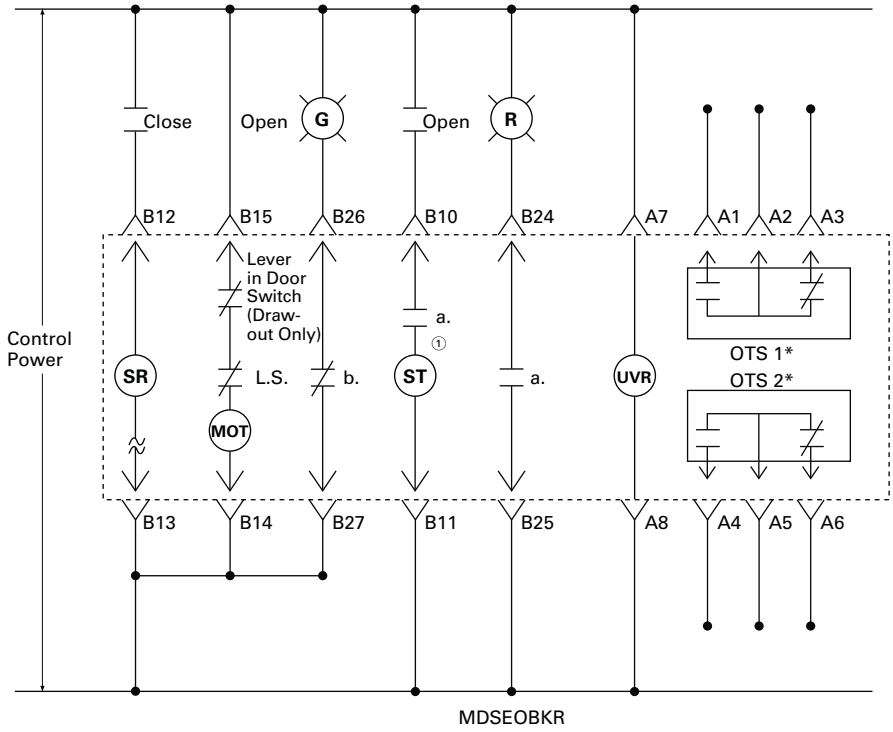


Figure 26.1-9. Typical Magnum Breaker Control Circuit Diagram

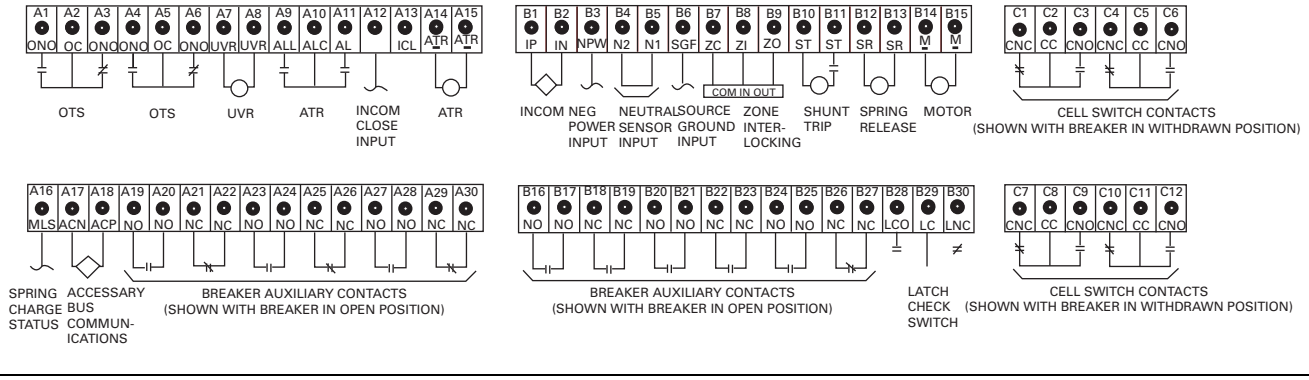


Figure 26.1-10. Typical Magnum Secondary Terminal Block Connection Diagram

Accessories and Peripheral Devices

Levering Tool

Levering Tool

Magnum drawout breakers are designed for closed door manual levering by use of a standard 3/8-inch (10 mm) drive set, which is a commonly available tool. This eliminates the need for a unique levering device, which tends to get lost if not properly stored.

Magnum Remote Racking Device

Magnum Breaker Remote Racking Device

Eaton's MRR1000 remote racking device provides a means of remotely inserting or removing any drawout circuit breaker in the Magnum DS and SB family of air circuit breakers (ACBs), to help mitigate arc flash exposure. The MRR1000 permits the operator to remotely open and close a breaker from up to 25 feet away during the rack-in or rack-out process, a distance well beyond the arc flash boundary for traditional LV switchgear.

- 120 Vac power supply (with plug)
- Works with all breakers in the Magnum family (MDS, MDN, SBS, SBN and CM52 network protectors)
- Locking fixture mounts directly to Magnum breaker escutcheon
- 25-foot umbilical cord between the operator and the device
- Hand-held pendant with OPEN/CLOSE and IN/OUT pushbuttons, with ENABLE button
- Ready lights indicating power to the unit and pendant
- Safety interlock prevents operation of unit until it is safely locked in place
- Complete racking in 25 seconds or less
- Handles for ease of installation
- Works on new and existing Magnum breakers without the need for any modifications to doors, breakers or structures

MRR1000 Connected to Magnum Breaker

Universal Remote Power Racking System (Type RPR-2)

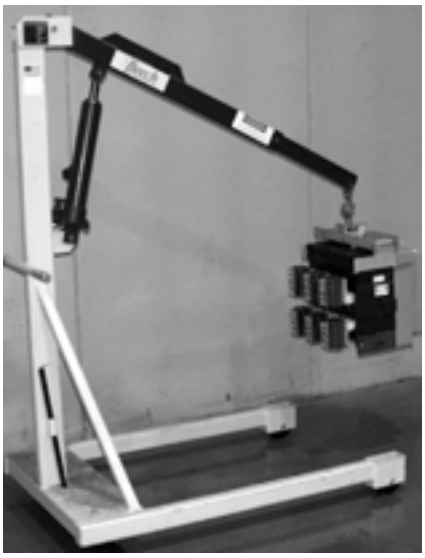
Remote Power Racking System

For maximum safety during drawout breaker levering operations, the universal remote power racking system (RPR-2) can be employed on Magnum, as well as other drawout low and medium voltage power circuit breakers that use rotation of a shaft for insertion or removal. Remote control is accomplished by an operator pendant with an INSERT and REMOVE pushbutton station and a 25-foot connecting cable. The RPR-2 requires 120 Vac, 15 A power from a common plug receptacle. Status indication and selectable torque limitation matched to the breaker racking mechanism are also provided.

Lifting Yoke and Floor Lifting Device

Magnum breakers include lifting ears on each side to accept a lifting yoke (or suitable sling) to facilitate lifting using a skyhook from a top of gear lifter, floor lifter or crane. Various lifting yoke style numbers are available for all Magnum frame types in both three-pole and four-pole configurations.

A roll-on-the-floor lifting device style number 6727D63H20 is equipped with a skyhook for use in conjunction with a breaker lifting yoke or suitable sling to lift the breaker from above. Shelf-type roll-on-the-floor lifters can also be used to lift the breaker from underneath without a lifting yoke.



Floor Lifting Device

Test Cabinet

The test cabinet is a separately mounted device with open and close pushbuttons that facilitates bench testing of electrically operated Magnum breakers. An input power cord is provided for connection to a 120 Vac, 15 A plug receptacle. The test cabinet output power is matched to the breaker control voltage(s) and is connected to the breaker via a cord that plugs into the breaker secondary contacts.

Hand-Held Functional Test Kit

Hand-Held Test Kit

A secondary injection hand-held test kit catalog number MTST120V or MTST240V is available to functionally test Magnum and Series G breakers equipped with Digitrip trip units. The kit includes test cords and faceplate templates to match the breaker being tested, and an auxiliary power module. This test kit functionally confirms proper operations at the minimum trip unit settings.

Auxiliary Power Module

The auxiliary power module catalog number PRTAAPM120V or PRTAAPM240V plugs into the receptacle located in the front of the trip unit to power the display and/or communications functions during bench testing. An input power cord is provided for connection to a 120 Vac or 230 Vac source.

Secondary Injection Test Kit

A test kit style number MTK2000 is available for secondary injection testing of Magnum breakers with Digitrip trip units. This test kit functionally confirms proper operation at all trip unit settings. Test reports can be downloaded to a PC via a removable SD card.

TripLink

TripLink style number 5720B59G01 enables the downloading of the trip unit protection settings and circuit data from one Digitrip 1150+ trip unit to another, which saves time during startup and maintenance.

TripLink is a means of transferring settings from one circuit breaker to another. TripLink transfers all protection settings and time and date, and the circuit breaker's circuit data. The transfer of these settings may be useful for cloning a lineup of circuit breakers, cloning a circuit breaker's settings for replacing the circuit breaker with its clone for maintenance purposes, or for making common settings for a test program.

TripLink Transfer

Series C, F-Frame Thermal-Magnetic 10–225 A Electronic RMS 15–225 A

F-Frame Breaker

Table 27.4-55. Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
1 2	1.38 (34.8) 2.75 (69.9)	6.00 (152.4) 6.00 (152.4)	3.38 (85.7) 3.38 (85.7)
3 4	4.13 (104.8) 5.50 (139.7)	6.00 (152.4) 6.00 (152.4)	3.38 (85.7) 3.38 (85.7)

Table 27.4-56. Thermal-Magnetic Trip Ratings

Frame	Ratings
ED, EDH, EDC	100, 125, 150, 175, 200, 225
EHD, FDB, FD, HFD, FDC, HFDDC	10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 125, 150
FD, HFD, FDC	175, 200, 225

Table 27.4-57. Digitrip 310+ Electronic Trip Units

Types	Frame	Ratings
FDE, HFDE, FDCE	225	100, 110, 125, 150, 160, 175, 200, 225
	160	60, 70, 80, 90, 100, 125, 150, 160
	80	15, 20, 30, 40, 50, 60, 70, 80

Table 27.4-58. UL 489 Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Trip Type ①	Interrupting Capacity (Symmetrical Amperes)					
			Volts AC (50/60 Hz)				Volts DC	
			240	277	480	600	125	250 ②③
EDB EDS	2, 3 2, 3	N.I.T.	22,000 42,000	— —	— —	— —	10,000 10,000	— —
ED EDH EDC ④	2, 3 2, 3 2, 3	N.I.T.	65,000 100,000 200,000	— — —	— — —	— — —	10,000 10,000 10,000	— — —
EHD	1 2, 3	N.I.T.	— 18,000	14,000 —	— 14,000	— —	10,000 —	— 10,000
FDB	2, 3, 4	N.I.T.	18,000	—	14,000	14,000	—	10,000
FD FD FDE ⑤	1 2, 3, 4 2, 3, 4	N.I.T.	— 65,000 65,000	35,000 — —	— 35,000 35,000	— — 18,000	10,000 — —	— 10,000 —
HFD HFD HFDE ⑤	1 2, 3, 4 2, 3, 4	N.I.T.	— 100,000 100,000	65,000 — —	— 65,000 65,000	— — 25,000	10,000 — —	— 22,000 —
FDC ④ FDCE ⑤	2, 3, 4	N.I.T.	200,000	—	100,000	35,000 25,000	—	22,000
HFDDC ⑥	3	N.I.T.	—	—	—	—	—	42,000 ⑦

① N.I.T. is non-interchangeable trip unit.
② Two-pole circuit breaker, or two poles of three-pole circuit breaker.
③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.
④ Current limiting.
⑤ Electronics available on three-pole only.
⑥ HFDDC is UL only and is not tested to other standards.
⑦ Interrupting rating is 35,000 A at 600 Vdc with three poles in series, for ungrounded systems only.

Table 27.4-59. Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material ⑧	Wire Type	AWG Wire Range	Metric Wire Range (mm^2)	Catalog Number Package of 3 Terminals
Standard Pressure Type Terminals					
20 (EHD)	Steel	Cu/Al	(1) #14–#10	2.5–4	**3T20FB** ⑨
100	Steel	Cu/Al	(1) #14–1/0	2.5–50	**3T100FB**
150	Aluminum	Cu/Al	(1) #4–4/0	25–95	**3TA150FB**
225	Aluminum	Cu/Al	(1) #4–4/0	25–95	**3TA225FD**
Optional Pressure Terminals					
50	Aluminum	Cu/Al	(1) #14–#4	2.5–16	**3TA50FB** ⑨
100	Aluminum	Cu/Al	(1) #14–1/0	2.5–50	**3TA100FD**
150	Stainless Steel	Cu	(1) #4–4/0	25–95	**3T150FB**
225	Aluminum	Cu/Al	(1) #6–300 kcmil	16–150	**3TA225FDK**

⑧ UL listed for use with copper or aluminum conductors as noted.
⑨ Not for use with ED, EDH, EDC breakers.

Internal Accessories

Note: For a complete listing of available external accessories, see Volume 4—Circuit Protection Catalog, CA08100005E, Section 25.

All internal accessories are of the plug-in type and are listed for field installation under UL File E64983. Internal accessories for sealed circuit breakers are listed under UL File E7819 for factory installation only. The available plug-in accessories include the following:

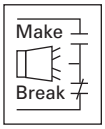
- Alarm (signal)/lockout switch
- Auxiliary switch
- Shunt trip
- Low energy shunt trip
- Undervoltage release mechanism

Typical Internal Plug-in Accessory Installed in K-Frame Circuit Breaker

Different accessory wiring options are available to satisfy most circuit breaker mounting applications. The standard wiring configuration is pigtail leads exiting the rear of the base directly behind the accessory. Optional configurations include a terminal block mounted on the same side of the base as the accessory, leads exiting the side of the base where the accessory is mounted, and leads exiting the rear of the base on the side opposite the accessory. If accessory leads longer than 18.00 inches (457.2 mm) are required, side-mounted terminal blocks should be used.

Alarm (Signal)/Lockout Switch

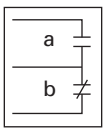
The alarm (signal)/lockout switch monitors circuit breaker trip status and provides remote signaling and interlocking capabilities when the circuit breaker trips. For two-, three- and four-pole circuit breakers, the alarm (signal)/lockout switch consists of one or two SPDT switches assembled to a plug-in module mounted in retaining slots in the top of the trip unit. The SPDT switch contacts are identified as make and break contacts. When the circuit breaker trips, the make contact closes and the break contact opens.



Alarm (Signal)/Lockout Switch

Auxiliary Switch

The auxiliary switch provides circuit breaker contact status information by monitoring the position of the molded crossbar containing the moving contact arms. The auxiliary switch is used for remote signaling and interlocking purposes, and consists of one or two SPDT switches assembled to a plug-in module mounted in retaining slots in the top of the trip unit. Each SPDT switch has one “a” and one “b” contact. When the circuit breaker contacts are open, the ”a“ contact is open and the “b” contact is closed.



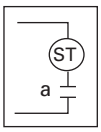
Auxiliary Switch

Shunt Trip

The shunt trip provides remote controlled tripping of the circuit breaker. The shunt trip consists of an intermittent rated solenoid with a tripping plunger and a cutoff switch assembled to a plug-in module. When required for ground fault protection applications, certain AC rated shunt trips are suitable for operation at 55% of rated voltage.

Available in most AC and DC voltages.

Note: Approximate unlatching time—6 milliseconds. Approximate total circuit breaker contact opening time—18 milliseconds. Endurance—4000 electrical operations plus 1000 mechanical operations. Supply voltages suitable for use with Class 1 GFP devices. Marking label included with accessory kits.



Shunt Trip

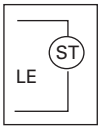
OPTIM Communications Kit

Eaton’s OPTIM Communications Kit provides the option to field install PowerNet communications into a K-, L- or N-Frame OPTIM 550 breaker. OPTIM 1050 trip units come equipped with communications as standard.

OPTIM Communications Kit

Low Energy Shunt Trip

Low energy shunt trip devices are designed to operate from low energy output signals from dedicated current sensors typically applied in ground fault protection schemes. However, with a proper control voltage source, they may be applied in place of conventional trip devices for special applications. Flux paths surrounding permanent magnets used in the shunt trip assembly hold a charged spring poised in readiness to operate the circuit breaker trip mechanism. When a 100 microfarad capacitor charged to 28 Vdc is discharged through the shunt trip coil, the resultant flux opposes the permanent magnet flux field, which releases the stored energy in the spring to trip the circuit breaker. As the circuit breaker resets, the reset arm is actuated by the circuit breaker handle, resetting the shunt trip. The plug-in module is mounted in retaining slots in the top of the trip unit. Coil is intermittent-rated only. Cutoff provisions required in control circuit.



Low Energy Shunt Trip

Undervoltage Release Mechanism

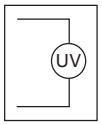
The undervoltage release mechanism monitors a voltage (typically a line voltage) and trips the circuit breaker when the voltage falls to between 70 and 35% of the solenoid coil rating.

Note: Undervoltage release mechanism accessories are not designed for, and should not be used as, circuit interlocks.

The undervoltage release mechanism consists of a continuous rated solenoid with a plunger and tripping lever assembled to a plug-in module.

The tab on the tripping lever resets the undervoltage release mechanism when normal voltage has been restored and the circuit breaker handle is moved to the reset (OFF) position.

With no voltage applied to the undervoltage release mechanism, the circuit breaker contacts will not touch when a closing operation is attempted.



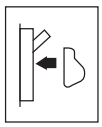
Undervoltage Release Mechanism

External Accessories

Note: For a complete listing of available external accessories, see Volume 4—Circuit Protection Catalog, CA08100005E, Section 25.

Non-Padlockable Handle Block

The nonlockable handle block secures the circuit breaker handle in either the ON or OFF position. (Trip-free operation allows the circuit breaker to trip when the handle block holds the circuit breaker handle in the ON position.) The device is positioned over the circuit breaker handle and secured by a set-screw to deter accidental operation of the circuit breaker handle. (Field installation only.)



Non-Padlockable Handle Block

Padlockable Handle Lock Hasp

The padlockable handle lock hasp allows the handle to be locked in the ON or OFF position. (Trip-free operation allows the circuit breaker to trip when the handle lock holds the circuit breaker handle in the ON position.) The hasp mounts on the circuit breaker cover within the trimline. The cover is predrilled on both sides of the operating handle so that the hasp can be mounted on either side of the handle. The hasp will accommodate up to three padlocks with 1/4-inch (6.4 mm) shackles. One per circuit breaker. (Field installation only.)

Padlockable Handle Lock Hasp

Key Interlock Kit (Lock Not Included)

The key interlock is used to externally lock the circuit breaker handle in the OFF position. When the key interlock is locked, an extended deadbolt blocks movement of the circuit breaker handle. Uniquely coded keys are removable only with the deadbolt extended. Each coded key controls a group of circuit breakers for a given specific customer installation.

The key interlock assembly consists of a mounting kit and a purchaser supplied deadbolt lock. The mounting kit comprises a mounting plate, which is secured to the circuit breaker cover in either the left- or right-pole position; key interlock mounting hardware; and a wire seal. Specific mounting kits are required for individual key interlock types. (Field installation only.)

Key Interlock Kit

Padlockable Handle Block

The device is positioned in the cover opening to prevent handle movement. Will accommodate one 5/16-inch (8.0 mm) padlock.

Padlockable Handle Block

Series C, K-Frame Electronic RMS, 70–400 A Thermal-Magnetic, 100–400 A

K-Frame Breaker

Table 27.4-64. Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
2, 3	5.50 (139.7)	10.13 (257.2)	4.06 (103.2)
4	7.22 (183.4)	10.13 (257.2)	4.06 (103.2)

Table 27.4-65. Thermal-Magnetic Trip Ratings

Frame	Ratings
DK, KDB, KD, HKD, KDC, HKDDC,	100, 125, 150, 175, 200, 225, 250, 300, 350, 400

Table 27.4-66. Digitrip 310+ Electronic Trip Units

Frame	Ratings
KD, CKD, HKD, CHKD, KDC	55, 60, 70, 90, 100, 110, 125, 150, 160, 175, 200, 225, 250, 300, 315, 350, 400

Table 27.4-67. Digitrip OPTIM Electronic Trip Unit Rating Plugs

Frame	Rating Plugs
KD, CKD, HKD, CHKD, KDC	70, 90, 100, 110, 125, 150, 175, 200, 225, 250, 300, 350, 400

Table 27.4-68. NEMA/UL 489/CSA Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Trip Type ①	Interrupting Capacity (Symmetrical Amperes)				
			Volts AC (50/60 Hz)			Volts DC	
			240	480	600	250 ②③	600 ④
DK	2, 3	N.I.T.	65,000	—	—	10,000	—
KDB	2, 3, 4	N.I.T.	65,000	35,000	25,000	10,000	—
KD	2, 3, 4	I.T.	65,000	35,000	25,000	10,000	—
HKD	2, 3, 4	I.T.	100,000	65,000	35,000	22,000	—
KDC ⑤	2, 3, 4	I.T.	200,000	100,000	65,000	22,000	—
HKDDC	3	I.T.	—	—	—	42,000 ⑦	35,000 ⑧
CKD ⑥	3	I.T.	65,000	35,000	25,000	—	—
CHKD ⑥	3	I.T.	100,000	65,000	35,000	—	—

① N.I.T. is non-interchangeable trip; I.T. is interchangeable trip.
② Two-pole circuit breaker or two outside poles of three-pole circuit breaker.
③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.
④ 8 milliseconds time constant.
⑤ Current limiting.
⑥ 100% rated.
⑦ Two poles in series.
⑧ Three poles in series.

Table 27.4-69. Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	AWG/Wire Range/Number Conductors	Metric Wire Range (mm^2)	Catalog Number
Standard Cu/Al Pressure Terminals					
225	Aluminum	Cu/Al	3–350 (1)	35–185	**TA300K** ⑨
350	Aluminum	Cu/Al	250–500 (1)	120–240	**TA350K** ⑨
400	Aluminum	Cu/Al	3/0–250 (2)	95–120	**2TA400K** ⑩⑪ **3TA400K** ⑩⑫ **4TA400K** ⑬⑭
Optional Copper and Cu/Al Pressure Type Terminals					
225	Copper	Cu	3–350 (1)	35–185	**T300K** ⑨
350	Copper	Cu	50–500 (1)	120–240	**T350K** ⑨
400	Copper	Cu	3/0–250 (2)	95–120	**2T400K** ⑪ **3T400K** ⑫ **4T400K** ⑬
400	Aluminum	Cu/Al	2/0–250 (2) or 2/0–500 (1)	70–120 70–240 70–240	**2TA401K** ⑩⑪ **3TA401K** ⑩⑫ **4TA401K** ⑬⑭
400	Aluminum	Cu/Al	500–750 (1)	300–400	**2TA402K** ⑩⑪ **3TA402K** ⑩⑫ **4TA402K** ⑬⑭
400	Copper	Cu/Al	500–750 (1)	—	**2T402K** ⑩⑪ **3T402K** ⑩⑫ **4T402K** ⑬⑭

⑨ Individually packed.
⑩ Terminal kits contain one terminal for each pole and one terminal cover.
⑪ Two-pole kit.
⑫ Three-pole kit.
⑬ Four-pole kit.
⑭ Terminal kits contain one terminal for each pole and three interphase barriers.

Panelboards

Project Name: Home 2 Flowood
General Order No:
Negotiation No: MH880916X6K3
Alternate No: 0002

Item No.	Qty	Product	Description
	1	Panelboards	42 Circuits, 225A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 225A, Main Lugs Only[Bottom Fed], Surface Mounted

Catalog No P1A225LB42AH01
Designation CA

Qty	List of Materials
1	225A, Main Lugs Only
34	20A, 1P BAB Branch Breaker
2	20A, 2P BAB Branch Breaker
2	30A, 2P BAB Branch Breaker
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 1 Enclosure: EZB2042R
1	EZ Trim, Door in Door, Concealed Hardware: EZT2042S

Item No.	Qty	Product	Description
	2	Panelboards	42 Circuits, 225A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 225A, Main Lugs Only[Bottom Fed], Surface Mounted

Catalog No P1A225LB42AH01
Designation CB

Qty	List of Materials
1	225A, Main Lugs Only
40	20A, 1P BAB Branch Breaker
2	20A, 1P QBGFT Branch Breaker, GFCI - 5mA
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 1 Enclosure: EZB2042R
1	EZ Trim, Door in Door, Concealed Hardware: EZT2042S

Item No.	Qty	Product	Description
	1	Panelboards	42 Circuits, 225A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 225A, Main Lugs Only[Bottom Fed], Surface Mounted

Catalog No P1A225LB42AH01
Designation OL

Qty	List of Materials
1	225A, Main Lugs Only
21	20A, 1P QBGFT Branch Breaker, GFCI - 5mA
19	20A, 1P BAB Branch Breaker
1	20A, 2P QBGFT Branch Breaker, GFCI - 5mA
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 1 Enclosure: EZB2042R
1	EZ Trim, Door in Door, Concealed Hardware: EZT2042S

Project Name: Home 2 Flowood
General Order No:
Negotiation No: MH880916X6K3
Alternate No: 0002

Item No.	Qty	Product	Description
	1	Panelboards	18 Circuits, 100A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 100A, Main Lugs Only[Top Fed], Flush Mounted

Catalog No P1A100LT18AH01
Designation PBX

Qty	List of Materials
1	100A, Main Lugs Only
12	20A, 1P BAB Branch Breaker
6	1P BAB Branch Provision Only
1	Insulated / Isolated and Std Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 1 Enclosure: EZB2036R
1	EZ Trim, Door in Door, Concealed Hardware: EZT2036F

Item No.	Qty	Product	Description
	1	Panelboards	30 Circuits, 225A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 225A, Main Lugs Only[Bottom Fed], Surface Mounted

Catalog No P1A225LB30AH01
Designation K

Qty	List of Materials
1	225A, Main Lugs Only
3	30A, 1P BAB Branch Breaker
1	50A, 3P BAB-H Branch Breaker
24	20A, 1P BAB Branch Breaker
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 1 Enclosure: EZB2036R
1	EZ Trim, Door in Door, Concealed Hardware: EZT2036S

Item No.	Qty	Product	Description
	1	Panelboards	42 Circuits, 225A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 225A, Main Lugs Only[Bottom Fed], Surface Mounted

Catalog No P1A225LB42AH01
Designation LDY

Qty	List of Materials
1	225A, Main Lugs Only
7	30A, 3P BAB-H Branch Breaker
1	40A, 3P BAB-H Branch Breaker
1	20A, 2P BAB Branch Breaker
2	20A, 1P QBGFT Branch Breaker, GFCI - 5mA
14	20A, 1P BAB Branch Breaker
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 1 Enclosure: EZB2042R
1	EZ Trim, Door in Door, Concealed Hardware: EZT2042S

Project Name: Home 2 Flowood
General Order No:
Negotiation No: MH880916X6K3
Alternate No: 0002

Item No.	Qty	Product	Description
	1	Panelboards	42 Circuits, 225A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 225A, Main Lugs Only[Bottom Fed], Surface Mounted

Catalog No P1A225LB42AH01
Designation HAC

Qty	List of Materials
1	225A, Main Lugs Only
1	30A, 2P BAB Branch Breaker
1	30A, 3P BAB-H Branch Breaker
5	20A, 2P BAB Branch Breaker
1	15A, 3P BAB-H Branch Breaker
1	50A, 2P BAB Branch Breaker
11	20A, 1P BAB Branch Breaker
3	40A, 3P BAB-H Branch Breaker
1	40A, 2P BAB Branch Breaker
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 1 Enclosure: EZB2048R
1	EZ Trim, Door in Door, Concealed Hardware: EZT2048S

Item No.	Qty	Product	Description
	1	Panelboards	18 Circuits, 100A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 100A, Main Lugs Only[Top Fed], Flush Mounted

Catalog No P1A100LT18AH01
Designation FD

Qty	List of Materials
1	100A, Main Lugs Only
18	20A, 1P BAB Branch Breaker
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 1 Enclosure: EZB2036R
1	EZ Trim, Door in Door, Concealed Hardware: EZT2036F

Item No.	Qty	Product	Description
	1	Panelboards	18 Circuits, 100A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 100A, Main Lugs Only[Bottom Fed], Surface Mounted

Catalog No P1A100LB18AH01
Designation PL

Qty	List of Materials
1	100A, Main Lugs Only
9	20A, 1P BAB Branch Breaker
5	20A, 1P QBGFT Branch Breaker, GFCI - 5mA
1	60A, 2P BAB Branch Breaker
1	20A, 2P QBGFT Branch Breaker, GFCI - 5mA
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 1 Enclosure: EZB2036R
1	EZ Trim, Door in Door, Concealed Hardware: EZT2036S

Item No.	Qty	Product	Description
	1	Panelboards	30 Circuits, 400A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 400A, Main Lugs Only[Bottom Fed], Surface Mounted

Catalog No P3A400LB36AH3R
Designation RF

Qty	List of Materials
1	400A, Main Lugs Only
2	15A, 1P BAB Branch Breaker
8	20A, 1P BAB Branch Breaker
2	30A, 3P BAB-H Branch Breaker
1	20A, 3P BAB-H Branch Breaker
1	25A, 3P BAB-H Branch Breaker
1	20A, 2P BAB Branch Breaker
2	110A, 3P FDB Branch Breaker
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 3R Enclosure: LWPQ2072

Item No.	Qty	Product	Description
	4	Panelboards	30 Circuits, 225A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 225A, Main Lugs Only[Bottom Fed], Surface Mounted

Catalog No P1A225LB30AH3R
Designation 2D,3D,4D,5D

Qty	List of Materials
1	225A, Main Lugs Only
5	100A, 2P BAB Branch Breaker
20	20A, 1P BAB Branch Breaker
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 3R Enclosure: LWPQ2036

Item No.	Qty	Product	Description
	14	Panelboards	42 Circuits, 225A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 225A, Main Lugs Only[Bottom Fed], Surface Mounted

Catalog No P1A225LB42AH3R
Designation 2A,2B,2C,3A,3B,3C,4A,4B,4C,5A,5B,5C,1A,1B

Qty	List of Materials
1	225A, Main Lugs Only
8	100A, 2P BAB Branch Breaker
8	20A, 1P BAB Branch Breaker
18	1P BAB Branch Provision Only
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 3R Enclosure: LWPQ2042

Project Name: Home 2 Flowood
General Order No:
Negotiation No: MH880916X6K3
Alternate No: 0002

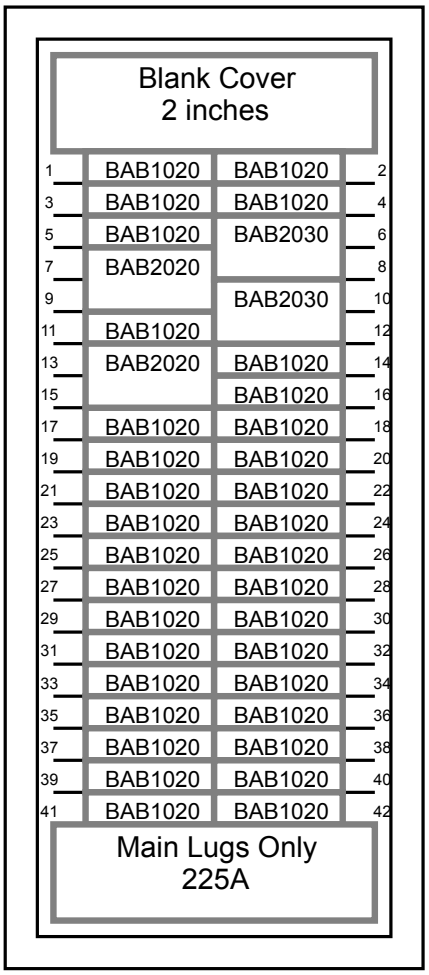
Item No.	Qty	Product	Description
	1	Panelboards	30 Circuits, 100A, Fully Rated, 208Y/120V 3Ph 4W, Aluminum Bus, 10k AIC, 100A, Main Lugs Only[Bottom Fed], Surface Mounted

Catalog No P1A100LB30AH01
Designation PH

Qty	List of Materials
1	100A, Main Lugs Only
30	20A, 1P BAB Branch Breaker
1	Std. Bolted Al Ground Bar (Al/Cu Cable)
1	Panel Nameplate - White with Black Letters
1	Type 1 Enclosure: EZB2036R
1	EZ Trim, Door in Door, Concealed Hardware: EZT2036S

Eaton Selling Policy None applies.

All orders must be released for manufacture within 90 days of date of order entry. If approval drawings are required, drawings must be returned approved for release within 60 days of mailing. If drawings are not returned accordingly, and/or if shipment is delayed for any reason, the price of the order will increase by 1.0% per month or fraction there of for the time the shipment is delayed.



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 1
Bus Rating & Type:	225A Aluminum	**Neutral Rating:**	225A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Bottom Cable Entry
Main Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Box Catalog No.: EZB2042R
Trim: EZ Trim, Door in Door, Concealed Hardware (EZT2042S)

Surface Mounted

Box Dimensions: 42.00" [1066.8mm]H x 20.00" [508.0mm]W x 5.75" [146.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate: **(1) CA**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: Standard Lock & Key (Keyed WEM2)
Circuit Directory: Plastic Sleeve with Card

Device Modifications:

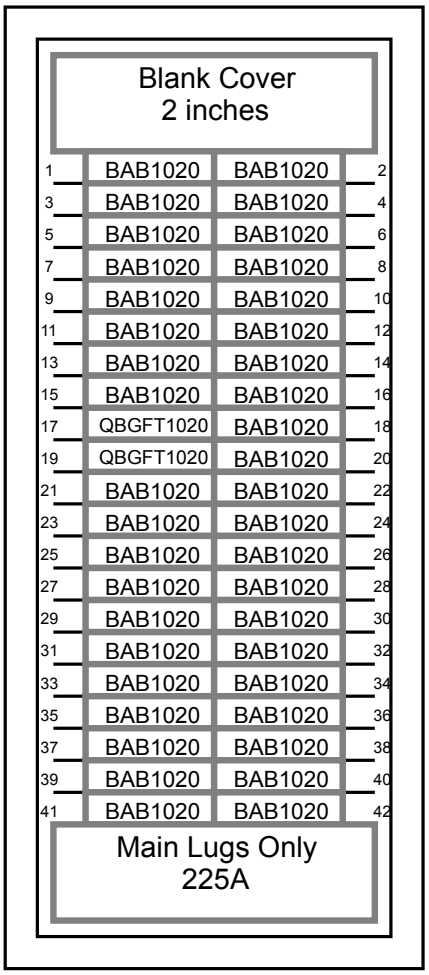
Ref #	Description

Notes:

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
34	1	20	BAB	100	10
2	2	20	BAB	100	10
2	2	30	BAB	100	10

PREPARED BY: TROY VANHOESEN	DATE: 1/18/2017	**Eaton**			
APPROVED BY:	DATE:	JOB NAME: Home 2 Flowood			
		DESIGNATION: CA			
VERSION: 1.0.0.12		TYPE: PRL1a		DRAWING TYPE: Customer Approval	
NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: A	G.O.:	ITEM:	SHEET: 1 of 1



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 1
Bus Rating & Type:	225A Aluminum	**Neutral Rating:**	225A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Bottom Cable Entry
Main Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Box Catalog No.: EZB2042R
Trim: EZ Trim, Door in Door, Concealed Hardware (EZT2042S)

Surface Mounted

Box Dimensions: 42.00" [1066.8mm]H x 20.00" [508.0mm]W x 5.75" [146.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate: **(1) CB**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: Standard Lock & Key (Keyed WEM2)
Circuit Directory: Plastic Sleeve with Card

Device Modifications:

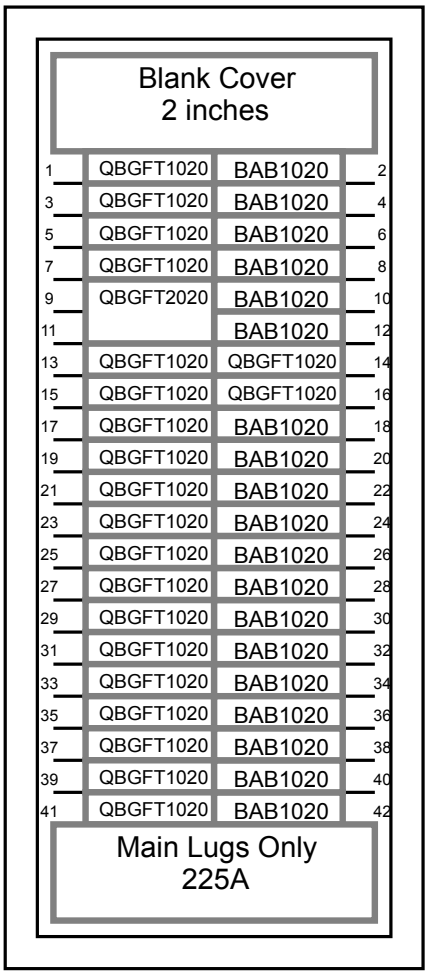
Ref #	Description

Notes:

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
40	1	20	BAB	100	10
2	1	20	QBGFT	100	10

PREPARED BY: TROY VANHOESEN	DATE: 1/18/2017	**Eaton**			
APPROVED BY:	DATE:	JOB NAME: Home 2 Flowood			
		DESIGNATION: CB			
VERSION: 1.0.0.12		TYPE: PRL1a		DRAWING TYPE: Customer Approval	
NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: A	G.O.:	ITEM:	SHEET: 1 of 1



General Information **(Section 1 of 1)**

Service Voltage: 208Y/120V 3Ph 4W **Enclosure:** Type 1
Bus Rating & Type: 225A Aluminum **Neutral Rating:** 225A
Ground Bar: Std. Bolted Aluminum, Al or Cu cable
S.C. Rating: 10k A.I.C. Fully Rated

Main Device Type: Main Lugs Only - Bottom Cable Entry
Main Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Box Catalog No.: EZB2042R
Trim: EZ Trim, Door in Door, Concealed Hardware (EZT2042S)

Surface Mounted

Box Dimensions: 42.00" [1066.8mm]H x 20.00" [508.0mm]W x 5.75" [146.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate: **(1) OL**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: Standard Lock & Key (Keyed WEM2)
Circuit Directory: Plastic Sleeve with Card

Device Modifications:

Ref #	Description

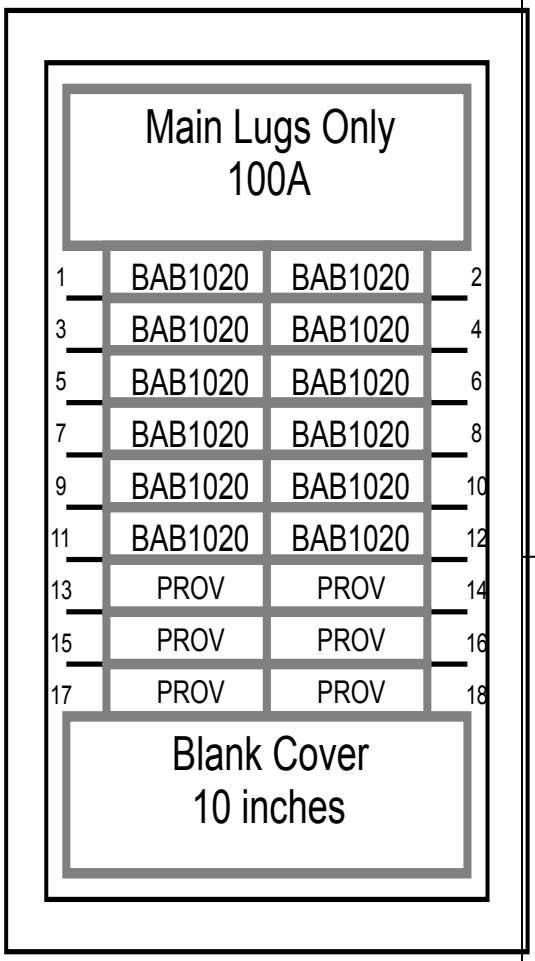
Notes:

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
21	1	20	QBGFT	100	10
19	1	20	BAB	100	10
1	2	20	QBGFT	100	10

PREPARED BY	DATE		
TROY VANHOESEN	1/18/2017	**Eaton**	
APPROVED BY	DATE	JOB NAME	Home 2 Flowood
		DESIGNATION	OL
VERSION		TYPE	DRAWING TYPE
1.0.0.12		PRL1a	Customer Approval

NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
MH880916X6K3-0002	0	A			1 of 1



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 1
Bus Rating & Type:	100A Aluminum	**Neutral Rating:**	100A
Ground Bar:	Insulated / Isolated Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Top Cable Entry
Main Terminals: Mechanical - (1) #14-1/0 (Cu/Al)
Neutral Terminals: Mechanical - (1) #14-1/0 (Cu/Al)
Box Catalog No.: EZB2036R
Trim: EZ Trim, Door in Door, Concealed Hardware (EZT2036F)

Flush Mounted

Box Dimensions: 36.00" [914.4mm]H x 20.00" [508.0mm]W x 5.75" [146.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate: **(1) PBX**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: Standard Lock & Key (Keyed WEM2)
Circuit Directory: Plastic Sleeve with Card

Device Modifications:

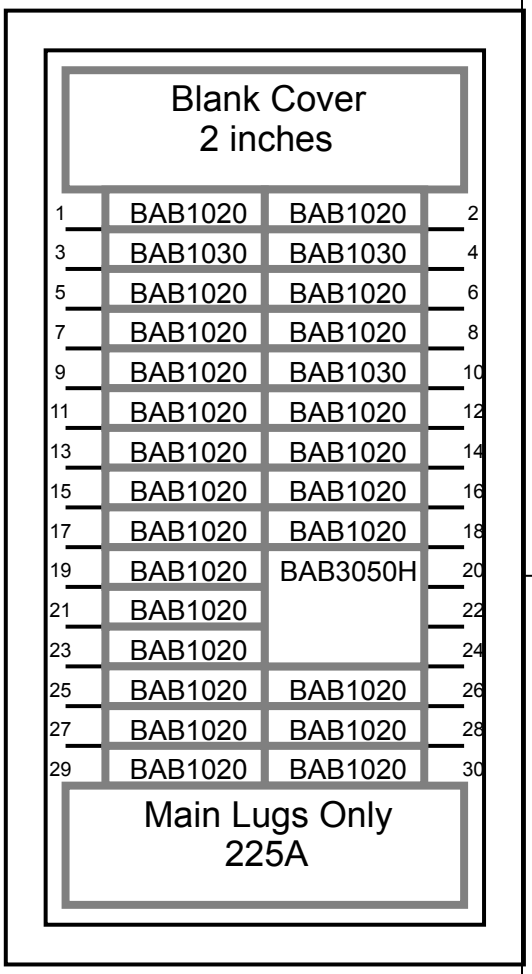
Ref #	Description

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
12	1	20	BAB	100	10
6	1		PROV		

Notes:

PREPARED BY: TROY VANHOESEN	DATE: 1/18/2017	**Eaton**			
APPROVED BY:	DATE:	JOB NAME: Home 2 Flowood			
		DESIGNATION: PBX			
VERSION: 1.0.0.12		TYPE: PRL1a		DRAWING TYPE: Customer Approval	
NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: A	G.O.:	ITEM:	SHEET: 1 of 1



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 1
Bus Rating & Type:	225A Aluminum	**Neutral Rating:**	225A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Bottom Cable Entry
Main Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Box Catalog No.: EZB2036R
Trim: EZ Trim, Door in Door, Concealed Hardware (EZT2036S)

Surface Mounted

Box Dimensions: 36.00" [914.4mm]H x 20.00" [508.0mm]W x 5.75" [146.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate: **(1) K**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: Standard Lock & Key (Keyed WEM2)
Circuit Directory: Plastic Sleeve with Card

Device Modifications:

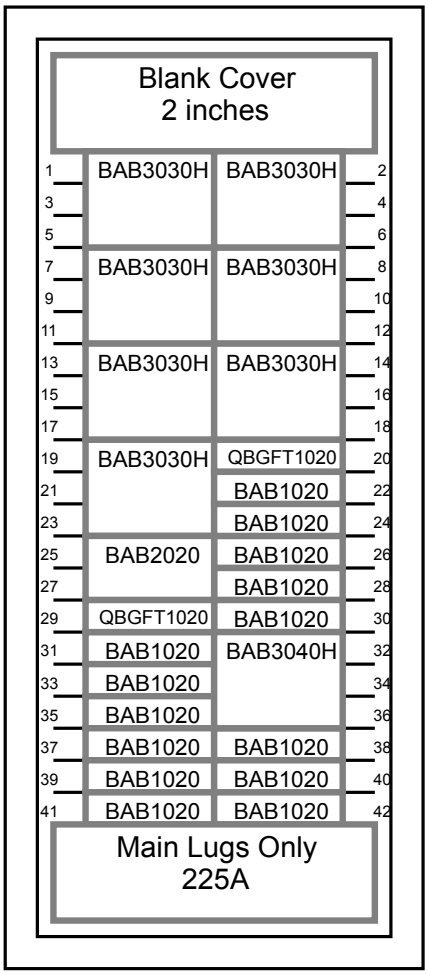
Ref #	Description

Notes:

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
3	1	30	BAB	100	10
1	3	50	BAB	100	10
24	1	20	BAB	100	10

PREPARED BY: TROY VANHOESEN	DATE: 1/18/2017	**Eaton**			
APPROVED BY:	DATE:	JOB NAME: Home 2 Flowood			
		DESIGNATION: K			
VERSION: 1.0.0.12		TYPE: PRL1a		DRAWING TYPE: Customer Approval	
NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: A	G.O.	ITEM	SHEET: 1 of 1



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 1
Bus Rating & Type:	225A Aluminum	**Neutral Rating:**	225A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Bottom Cable Entry
Main Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Box Catalog No.: EZB2042R
Trim: EZ Trim, Door in Door, Concealed Hardware (EZT2042S)

Surface Mounted

Box Dimensions: 42.00" [1066.8mm]H x 20.00" [508.0mm]W x 5.75" [146.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate: **(1) LDY**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: Standard Lock & Key (Keyed WEM2)
Circuit Directory: Plastic Sleeve with Card

Device Modifications:

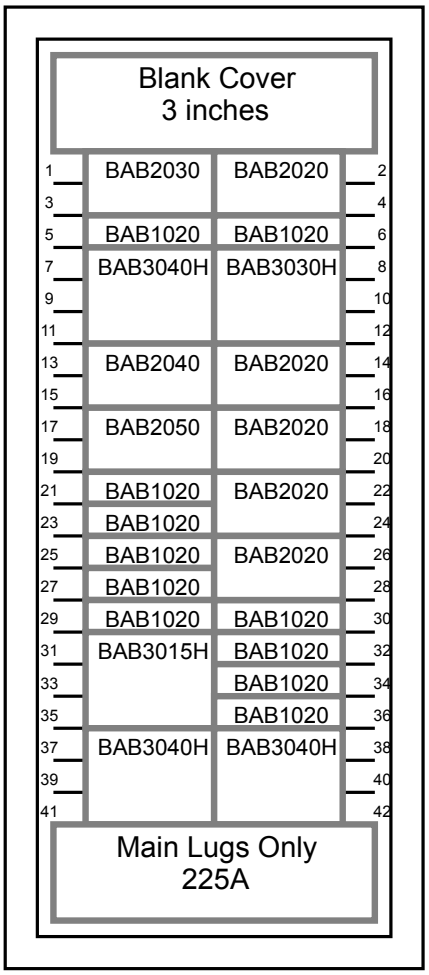
Ref #	Description

Notes:

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
7	3	30	BAB	100	10
1	3	40	BAB	100	10
1	2	20	BAB	100	10
2	1	20	QBGFT	100	10
14	1	20	BAB	100	10

PREPARED BY: TROY VANHOESEN	DATE: 1/18/2017	**Eaton**			
APPROVED BY:	DATE:	JOB NAME: Home 2 Flowood			
		DESIGNATION: LDY			
VERSION: 1.0.0.12		TYPE: PRL1a		DRAWING TYPE: Customer Approval	
NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: A	G.O.:	ITEM:	SHEET: 1 of 1



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 1
Bus Rating & Type:	225A Aluminum	**Neutral Rating:**	225A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Bottom Cable Entry
Main Terminals: Mechanical - (1) #4-500 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (1) #4-500 kcmil (Cu/Al)
Box Catalog No.: EZB2048R
Trim: EZ Trim, Door in Door, Concealed Hardware (EZT2048S)

Surface Mounted

Box Dimensions: 48.00" [1219.2mm]H x 20.00" [508.0mm]W x 5.75" [146.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate: **(1) HAC**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: Standard Lock & Key (Keyed WEM2)
Circuit Directory: Plastic Sleeve with Card

Device Modifications:

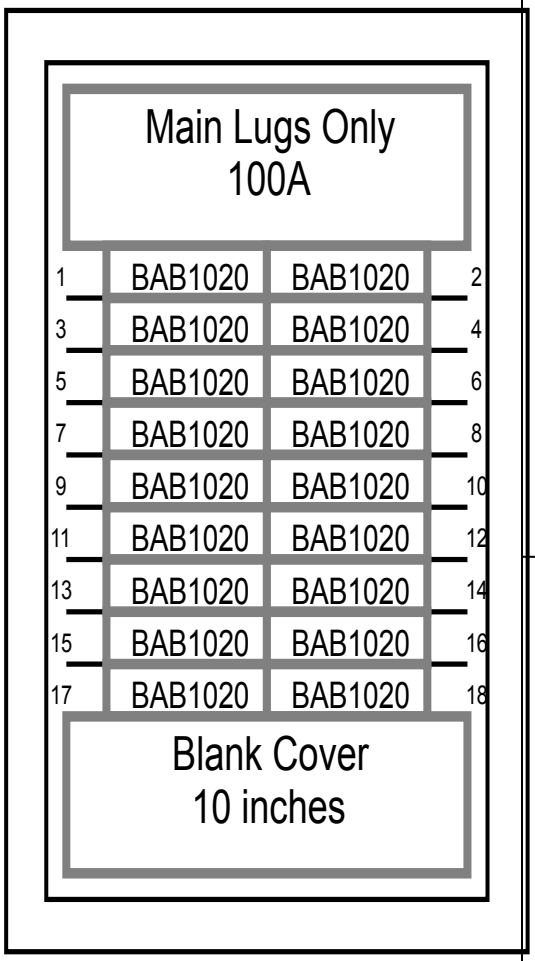
Ref #	Description

Notes:

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
1	2	30	BAB	100	10
11	1	20	BAB	100	10
3	3	40	BAB	100	10
1	2	40	BAB	100	10
1	2	50	BAB	100	10
1	3	15	BAB	100	10
5	2	20	BAB	100	10
1	3	30	BAB	100	10

PREPARED BY: TROY VANHOESEN	DATE: 1/18/2017	**Eaton**			
APPROVED BY:	DATE:	JOB NAME: Home 2 Flowood			
		DESIGNATION: HAC			
VERSION: 1.0.0.12		TYPE: PRL1a		DRAWING TYPE: Customer Approval	
NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: A	G.O.:	ITEM:	SHEET: 1 of 1



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 1
Bus Rating & Type:	100A Aluminum	**Neutral Rating:**	100A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Top Cable Entry
Main Terminals: Mechanical - (1) #14-1/0 (Cu/Al)
Neutral Terminals: Mechanical - (1) #14-1/0 (Cu/Al)
Box Catalog No.: EZB2036R
Trim: EZ Trim, Door in Door, Concealed Hardware (EZT2036F)

Flush Mounted

Box Dimensions: 36.00" [914.4mm]H x 20.00" [508.0mm]W x 5.75" [146.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate: **(1) FD**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: Standard Lock & Key (Keyed WEM2)
Circuit Directory: Plastic Sleeve with Card

Device Modifications:

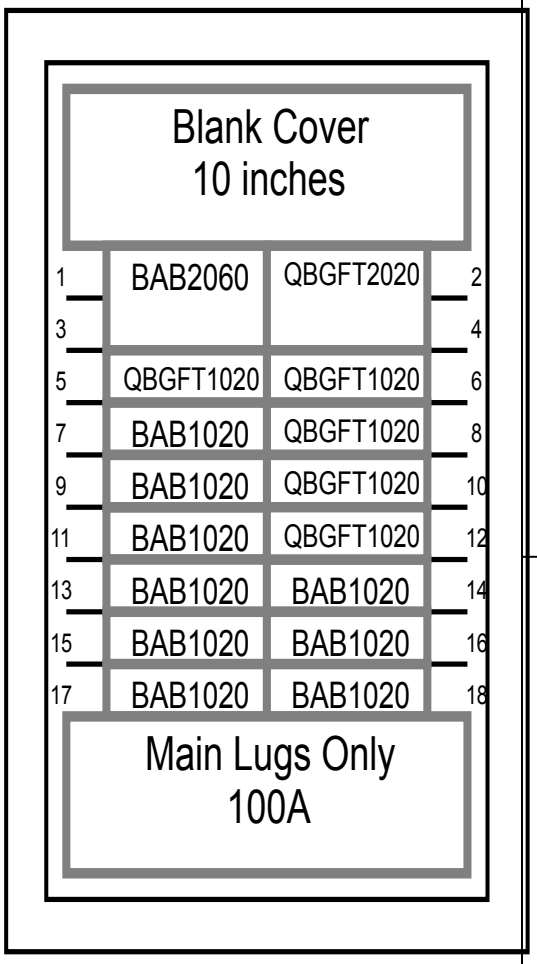
Ref #	Description

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
18	1	20	BAB	100	10

Notes:

PREPARED BY	DATE				
TROY VANHOESEN	1/18/2017	**Eaton**			
APPROVED BY	DATE	JOB NAME	Home 2 Flowood		
		DESIGNATION	FD		
VERSION		TYPE		DRAWING TYPE	
1.0.0.12		PRL1a		Customer Approval	
NEG-ALT Number	REVISION / DWG SIZE	G.O.		ITEM	SHEET
MH880916X6K3-0002	0 / A				1 of 1



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 1
Bus Rating & Type:	100A Aluminum	**Neutral Rating:**	100A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Bottom Cable Entry
Main Terminals: Mechanical - (1) #14-1/0 (Cu/Al)
Neutral Terminals: Mechanical - (1) #14-1/0 (Cu/Al)
Box Catalog No.: EZB2036R
Trim: EZ Trim, Door in Door, Concealed Hardware (EZT2036S)

Surface Mounted

Box Dimensions: 36.00" [914.4mm]H x 20.00" [508.0mm]W x 5.75" [146.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate: **(1) PL**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: Standard Lock & Key (Keyed WEM2)
Circuit Directory: Plastic Sleeve with Card

Device Modifications:

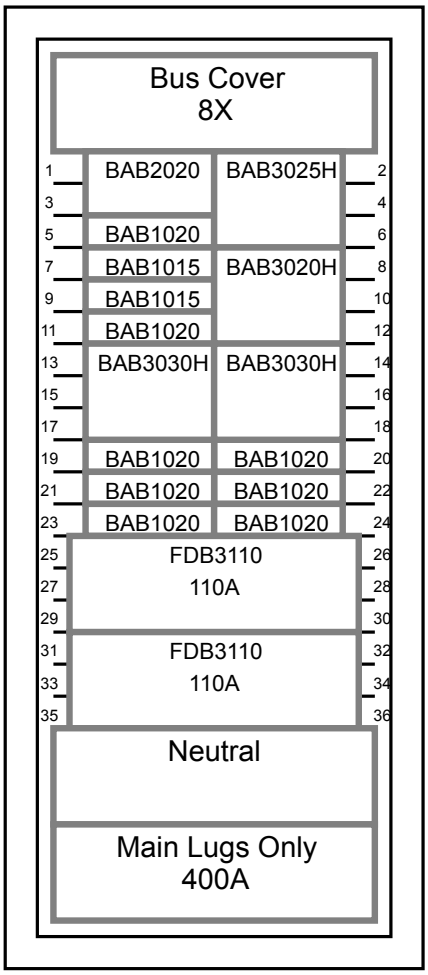
Ref #	Description

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
9	1	20	BAB	100	10
5	1	20	QBGFT	100	10
1	2	60	BAB	100	10
1	2	20	QBGFT	100	10

Notes:

PREPARED BY: TROY VANHOESEN	DATE: 1/18/2017	**Eaton**			
APPROVED BY:	DATE:	JOB NAME: Home 2 Flowood			
		DESIGNATION: PL			
VERSION: 1.0.0.12		TYPE: PRL1a		DRAWING TYPE: Customer Approval	
NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: A	G.O.:	ITEM:	SHEET: 1 of 1



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 3R
Bus Rating & Type:	400A Aluminum	**Neutral Rating:**	400A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Bottom Cable Entry
Main Terminals: Mechanical - (2) #4-500 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (2) #4-500 kcmil (Cu/Al)
Box Catalog No.: LWPQ2072
Trim: Complete Enclosure (Includes Trim)

Surface Mounted

Box Dimensions: 72.00" [1828.8mm]H x 20.00" [508.0mm]W x 6.5" [165.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 4" [101.6mm] Right = 4" [101.6mm]

Panel ID Nameplate: **(1) RF**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: T-Handle Lock Assembly
Circuit Directory: Plastic Sleeve with Card
Painted Box: ANSI 61

Device Modifications:

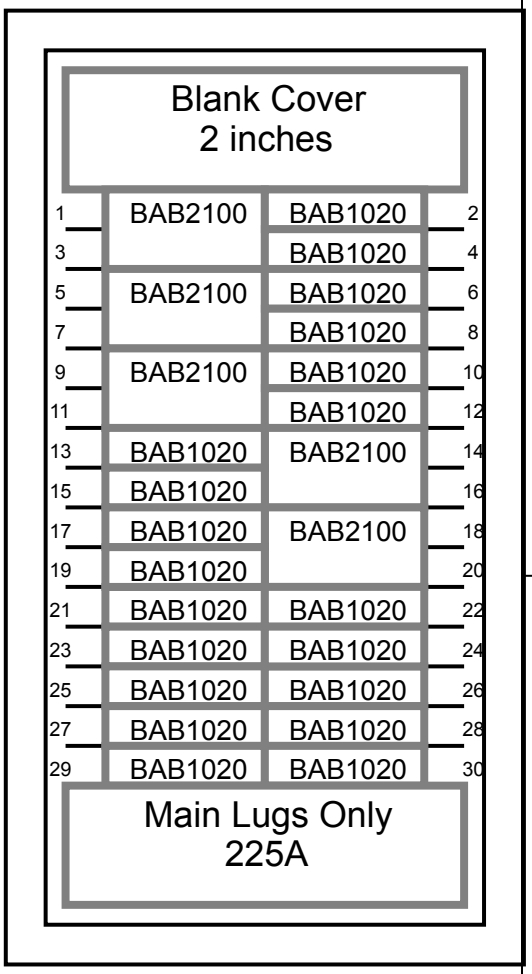
Ref #	Description

Notes:

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
2	1	15	BAB	100	10
8	1	20	BAB	100	10
2	3	30	BAB	100	10
1	3	20	BAB	100	10
1	3	25	BAB	100	10
1	2	20	BAB	100	10
2	3	110	FDB	150	10

PREPARED BY	DATE				
TROY VANHOESEN	1/18/2017	**Eaton**			
APPROVED BY	DATE	JOB NAME	Home 2 Flowood		
		DESIGNATION	RF		
VERSION		TYPE		DRAWING TYPE	
1.0.0.12		PRL3a		Customer Approval	
NEG-ALT Number	REVISION / DWG SIZE	G.O.		ITEM	SHEET
MH880916X6K3-0002	0 / A				1 of 1



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 3R
Bus Rating & Type:	225A Aluminum	**Neutral Rating:**	225A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Bottom Cable Entry
Main Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Box Catalog No.: LWPQ2036
Trim: Complete Enclosure (Includes Trim)

Surface Mounted

Box Dimensions: 36.00" [914.4mm]H x 20.00" [508.0mm]W x 6.5" [165.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate: **(1) 2D, 3D, 4D, 5D**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: T-Handle Lock Assembly
Circuit Directory: Plastic Sleeve with Card
Painted Box: ANSI 61

Device Modifications:

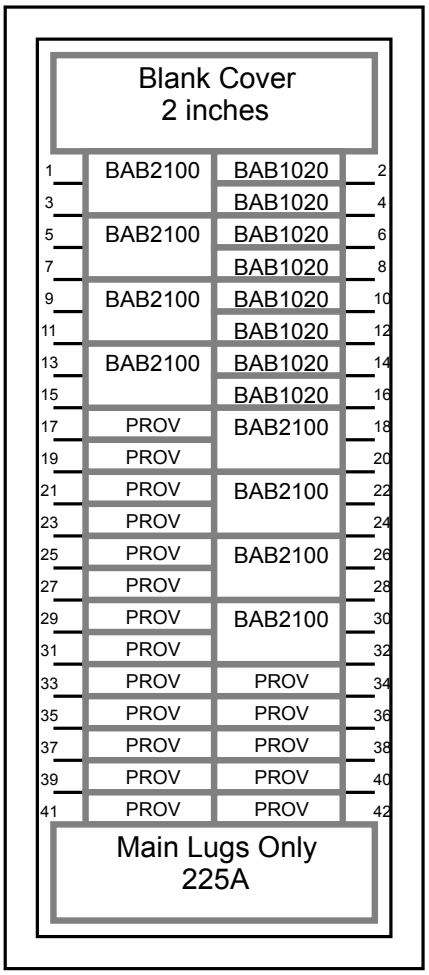
Ref #	Description

Notes:

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
5	2	100	BAB	100	10
20	1	20	BAB	100	10

PREPARED BY	DATE	**Eaton**			
TROY VANHOESEN	1/18/2017				
APPROVED BY	DATE	JOB NAME	Home 2 Flowood		
		DESIGNATION	2D, 3D, 4D, 5D		
VERSION		TYPE		DRAWING TYPE	
1.0.0.12		PRL1a		Customer Approval	
NEG-ALT Number	REVISION / DWG SIZE	G.O.		ITEM	SHEET
MH880916X6K3-0002	0 / A				1 of 1



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 3R
Bus Rating & Type:	225A Aluminum	**Neutral Rating:**	225A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Bottom Cable Entry
Main Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Neutral Terminals: Mechanical - (1) #6-300 kcmil (Cu/Al)
Box Catalog No.: LWPQ2042
Trim: Complete Enclosure (Includes Trim)

Surface Mounted

Box Dimensions: 42.00" [1066.8mm]H x 20.00" [508.0mm]W x 6.5" [165.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate: **(1) 2A, 2B, 2C, 3A, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 5C,...**
Type: Plastic, adhesive-backed **(2) 208Y/120V 3Ph 4W**
Color: White with Black Letters **(3)**

UL

Trim Lock: T-Handle Lock Assembly
Circuit Directory: Plastic Sleeve with Card
Painted Box: ANSI 61

Device Modifications:

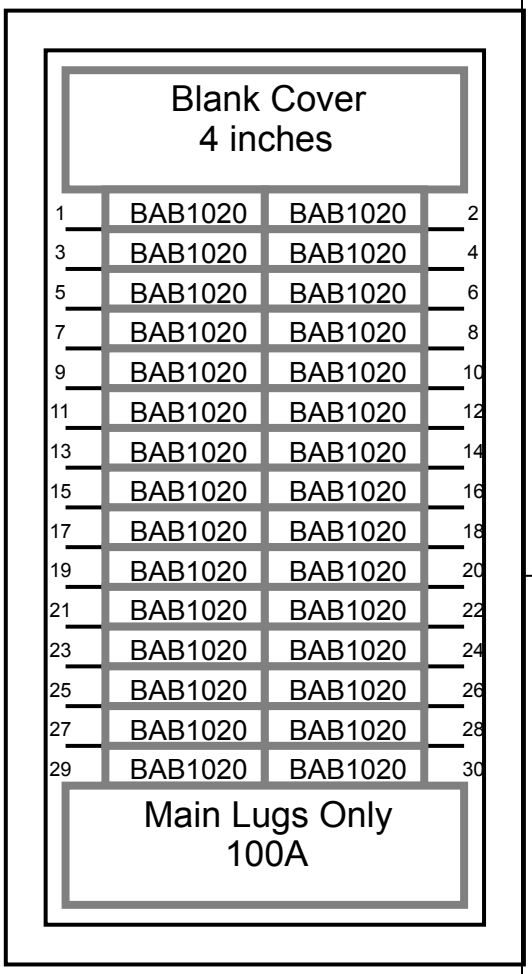
Ref #	Description

Notes:

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
8	2	100	BAB	100	10
8	1	20	BAB	100	10
18	1		PROV		

PREPARED BY: TROY VANHOESEN	DATE: 1/18/2017	**Eaton**			
APPROVED BY:	DATE:	JOB NAME: Home 2 Flowood			
		DESIGNATION: 2A, 2B, 2C, 3A, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 5C,...			
VERSION: 1.0.0.12		TYPE: PRL1a		DRAWING TYPE: Customer Approval	
NEG-ALT Number: MH880916X6K3-0002	REVISION: 0	DWG SIZE: A	G.O.:	ITEM:	SHEET: 1 of 1



General Information **(Section 1 of 1)**

Service Voltage:	208Y/120V 3Ph 4W	**Enclosure:**	Type 1
Bus Rating & Type:	100A Aluminum	**Neutral Rating:**	100A
Ground Bar:	Std. Bolted Aluminum, Al or Cu cable		
S.C. Rating:	10k A.I.C. Fully Rated		

Main Device Type: Main Lugs Only - Bottom Cable Entry
Main Terminals: Mechanical - (1) #14-1/0 (Cu/Al)
Neutral Terminals: Mechanical - (1) #14-1/0 (Cu/Al)
Box Catalog No.: EZB2036R
Trim: EZ Trim, Door in Door, Concealed Hardware (EZT2036S)

Surface Mounted

Box Dimensions: 36.00" [914.4mm]H x 20.00" [508.0mm]W x 5.75" [146.1mm]D
Min. Gutter Size: Top = 5.5" [139.7mm] Bottom = 5.5" [139.7mm]
Left = 6.0" [152.4mm] Right = 6.0" [152.4mm]

Panel ID Nameplate:
Type: Plastic, adhesive-backed
Color: White with Black Letters

(1) PH
(2) 208Y/120V 3Ph 4W
(3)

UL

Trim Lock: Standard Lock & Key (Keyed WEM2)
Circuit Directory: Plastic Sleeve with Card

Device Modifications:

Ref #	Description

Notes:

Branch Devices

Qty	Poles	Trip	Frame	Amps	kAIC
30	1	20	BAB	100	10

PREPARED BY: TROY VANHOESEN	DATE: 1/18/2017	**Eaton**	
APPROVED BY:	DATE:	JOB NAME: Home 2 Flowood	
		DESIGNATION: PH	
VERSION: 1.0.0.12		TYPE: PRL1a	DRAWING TYPE: Customer Approval

NEG-ALT Number	REVISION	DWG SIZE	G.O.	ITEM	SHEET
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Pow-R-Line C Panelboards

Product Description

Lighting and Distribution Panelboards

Eaton's assembled panelboards are designed for sequence phase connection of branch circuit devices. This allows complete flexibility of circuit arrangement (single-, two- or three-pole) to allow balance of the electrical load on each phase.

Sturdy, rigid chassis assembly ensures accurate alignment of interior with panel front; prevents flexing and minimizes possibility of loosening or damage to current carrying parts during and after installation.

Four-point in-and-out adjustment of panel interior is provided to meet critical depth dimensions on flush installations. This compensates for possible misalignment of box at installation.

Main lugs are mechanical solderless type and approved for copper or aluminum conductors.

Enclosures

Boxes are code-gauge galvanized steel, which include a painted box finished in ANSI-61 light gray to match the trim.

Standard panelboard cabinets are designed for indoor use. Alternate types are available for indoor and special purpose applications.

All enclosures are furnished in accordance with Underwriters Laboratories standards and include wiring gutters with proper wire bending space. Special cabinets can be provided at an additional charge.

The box dimensions shown are inside dimensions. For outside dimensions, add 1/4-inch (6.4 mm).

Standard panelboard boxes are supplied without knockouts (blank endwalls).

Fronts

Fronts (trims) for all panelboards are made of code-gauge steel and have a high durability ANSI-61 light gray finish applied by a baked-on polyester powder coating paint system.

The fronts for lighting and appliance branch circuit panelboards and small power distribution panelboards include a door with rounded corners and concealed hinges. A flush-type latch and lock assembly is included. All locks are keyed alike. These trims are available in both surface- and flush-mounted designs.

EZ Trim Features Standard Door-in-Door with No Exposed Hardware or Sharp Edges (no Tools are Required for Installation)

The Three-Piece Trim for Larger Power Distribution Panelboards Provides for Easy Handling and Installation

Fronts for power distribution panelboards utilize a unique breaker front cover design in which each device has a dedicated bolt-on steel cover. The individual covers form a single deadfront for the panelboard that is used in conjunction with two wiring gutter covers to complete the trim. A door is not finished as part of the standard offering on these panelboards but can be provided, for an additional charge, using a deeper than standard box.

Application Description

Panelboard Selection Factors

In selecting a panelboard, the following factors must be considered:

- Service (voltage and frequency)
- Interrupting capacity (fully or series rated)
- Ampere rating of main
- Ampere ratings of branches
- Environment

Panelboard Short-Circuit Rating

The short-circuit rating of Eaton's assembled panelboards are test verified by, and listed with, Underwriters Laboratories (UL). Generally, these ratings are that of the lowest interrupting rated device in the panel.

Certain exceptions to this rule exist where branch devices have been UL tested in combination with specific main devices having a higher interrupting rating. Where these defined main devices and branch breaker combinations are utilized, the series short-circuit rating of the assembled panelboard will be the same as the tested rating of the approved rated main device in series with the branches. Available main and branch breaker combinations are tabulated starting on **Page V2-T3-16**. All combinations shown are UL tested and listed.

These series ratings apply to panels having main devices, or main lug only panelboards fed remotely by the device listed in the series ratings chart as the main, for which UL listed tests were conducted.

Service Entrance Equipment

The National Electrical Code (NEC) requires that:

- A panel used as service entrance equipment must be located near the point where the supply conductors enter the building
- A panelboard having main lugs only shall have a maximum of six service disconnects to de-energize the entire panelboard from the supply conductors. Where more than six disconnects are required, a main service disconnect must be provided
- A disconnectable electrical bond must be provided between the neutral and ground
- A service entrance type UL label must be factory installed
- Ground fault protection of equipment shall be provided for each service disconnect rated 1000A or more if the electrical service is a solidly grounded wye system of more than 150V to ground, but not exceeding 600V phase-to-phase

Note: Service entrance panels must be identified as such on the order.

Panelboard Standards

In 2008, both the National Electrical Code (Article 408) and UL 67 were updated to remove the mandated 42-circuit limitation. Eaton offers panelboards with more than 42 circuits for those jurisdictions that have adopted the 2008 NEC or later.

For jurisdictions that have not adopted the 2008 or later version of the National Electrical Code, the 42-circuit limitation for Lighting and Appliance Branch Panelboards remains in place. Check with your local code officials to determine specific jurisdiction status.

Panelboard Installation

NEC requires that the operating handle of the topmost mounted device be no more than 6 feet 7 inches (2006.6 mm) above the finished floor and should be installed per NEC and manufacturer's instructions.

Additional boxes and fronts are required when the components required for one panelboard exceed the standard box dimensions.

Multi-Section Panelboards

When two or more separate enclosures are required, separate fronts for each box are standard. A common front can be furnished at additional charge.

Interconnecting Multi-Section Panelboards

When a panelboard, for connection to one feeder, must be furnished in more than one section (Box), each section must be furnished with main bus and terminals of the same rating, unless a main overcurrent device is provided in each section.

Sub-feed or through-feed provisions must also be included (and priced) to provide connection capability to the second section.

Note: Sub-feed or through-feed lugs cannot be used on any panelboard that is not protected by a single main overcurrent device either in the panelboard or immediately upstream, i.e., service entrance panelboards with main lugs only using the six disconnect rule.

Sub-Feed Lugs

Sub-feed lugs (see figure below) are one means of interconnecting multi-section panels. The sub-feed (second set of) lugs are mounted directly beside the main lugs. These are required in each section except the last panel in the lineup. The feeder cables are brought into the wiring gutter of the first section and connected to the main lugs. Another set of the same size cables are connected to the sub-feed lugs (Section 1) and are carried over to the main lugs of the adjacent panel. Cross connection cables are not furnished by Eaton. Sub-feed lugs are only available on main lug only panels.

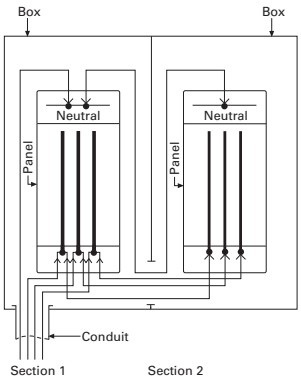
Note: Sub-feed lugs may not be used on main lug only (six disconnect rule) service entrance panels.

Through-Feed Lugs

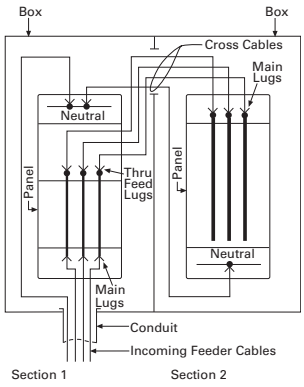
Through-feed lugs (see figure below) are another method to interconnect multi-section panelboards. The incoming feeder cables are connected to the main lugs or main breaker at the bottom of panel (Section 1). Another set of lugs (through-feed) are located at the opposite end of the main bus. The interconnecting cables are connected to the through-feed lugs in Section 1 and are carried over to the main lugs in Section 2. The connection arrangement could be reversed, i.e., main lugs at top; through-feed lugs at bottom end of panel. Cross cables are not furnished by Eaton.

Note: Through-feed lugs may not be used on main lug only (six disconnect rule) service entrance panels.

Sub-Feed Lugs



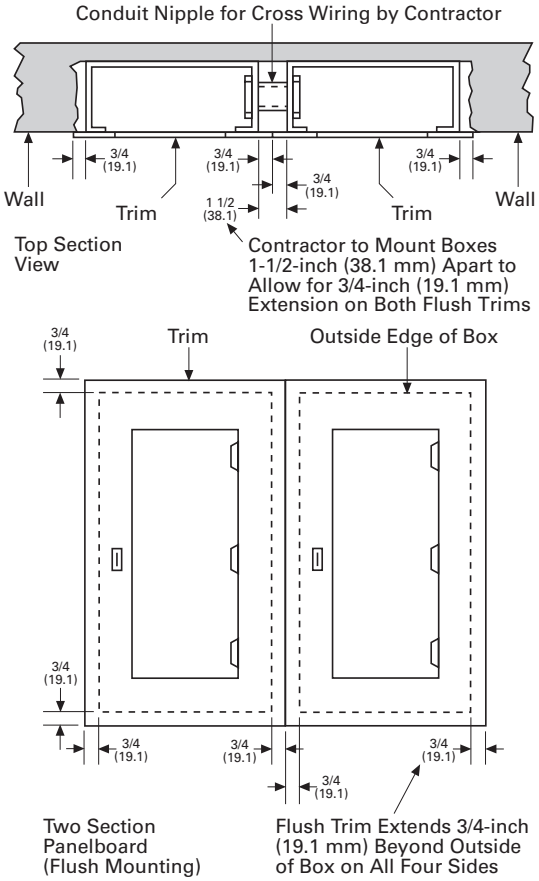
Through-Feed Lugs



Multiple Section Panelboard—Flush Mounted

Shown below is the standard method for flush mounting multiple section lighting and distribution panelboards using standard flush trims.

Multiple Section Panelboard Flush Mounted—Dimensions in Inches (mm)



Overcurrent Protection

The following requirements will be found in the NEC:

Each lighting and appliance branch circuit panelboard shall be individually protected on the supply side by not more than two main circuit breakers or two sets of fuses having a combined rating not greater than that on the panelboard.

Branch Circuit Loading for Lighting Panels

The size of mains and branches should be selected based on the following:

- Motor circuits: NEC Article 430
- Diversity factor
- Provision for future loading

Exception Number 1: Individual protection for a lighting panelboard is not required when the panelboard feeder has overcurrent protection not greater than that of the panelboard.

Exception Number 2: For existing installations, individual protection for lighting panelboards is not required where such panelboards are used as service equipment in supplying an individual residential occupancy and where any bus supplying 15 or 20A circuits is protected on the supply side by an overcurrent device.

Ambient Temperatures

The primary function of an overcurrent device is to protect the conductor and its insulation against overheating. In selecting the size of the devices and conductors, consideration should be given to the ambient temperature surrounding the conductors within and external to the panelboard. Cumulative heating within the panelboard may cause premature operation of the overcurrent protective devices.

Underwriters Laboratories test procedures are based, in part, on 80% loading of panelboard branch circuit devices. The NEC limits the loading of overcurrent devices in panelboards to 80% of rating where in normal operation the load will continue for three hours or more. Further derating may be required, depending on such factors as ambient temperature, duty cycle, frequency or altitude.

Exception: There is one exception to this rule in both UL and NEC. It applies to assemblies and overcurrent devices that have been listed for continuous duty at 100% of its rating.

Special Conditions

Standard panelboards, assembled with standard components, are adequate for most applications. However, special consideration should be given to those required for application under special conditions such as:

- Excessive vibration or shock
- Frequencies above 60 cycles
- Altitudes above 6600 feet (2011.7m)
- Damp environment (possible fungus growth)
- Compliance with federal, state and municipal electrical codes and standards

Seismic Considerations

The Uniform Building Code® and the International Building Code, as well as local and state building codes, place an emphasis on seismic building design requirements. Electrical distribution systems are treated as attachments to the building and therefore, fall into this category.

All Eaton panelboards are seismic qualified at the highest possible level, and have been tested in accordance with ANSI C37.81. This standard quantifies actual earthquake conditions, as well as equipment seismic capability.

Harmonic Currents

Standard panelboard neutrals are rated for 100% of the panelboard current. However, since harmonic currents can cause overheated neutrals, an option is provided for neutrals to be rated at 200% (1200A maximum neutral for 600A main bus) of the panelboard phase current.

Panelboards with the 200% rated neutral are UL listed as suitable for use with non-linear loads.

Prior to specifying the 200% rated neutral, Eaton recommends a harmonic survey be conducted of the distribution system, be it new or existing.

Surge Protective Devices

The quality of power feeding sensitive electronic loads is critical to the reliable operation of any facility. In modern offices, hospitals, and manufacturing facilities, the most frequent causes of microprocessor-based equipment downtime and damage are voltage transients and electrical noise.

Electrical loads and microprocessor-based equipment are highly susceptible to both high and low energy transients. High energy transients include lightning induced surges and power company switching. These high energy transients can destroy components instantly.

More frequently the electrical system experiences low energy transients and high frequency noise.

The effects of continual low energy transients and high frequency noise can cause erratic equipment performance or sudden failure of electronic circuit board components.

Eaton can provide protective and diagnostic systems integral to panelboards. The surge protective device (SPD) is integrated into the panelboards using a "zero lead length" direct bus bar connection.

Pow-R-Line 4

The SPD protects sensitive electronic equipment from the damaging effects of high and low energy transients, as well as high frequency noise.

Standards and Certifications

Eaton's panelboards are designed to meet the following applicable industry standards, except where noted:

- Underwriters Laboratories:
  - Panelboards: UL 67
  - Cabinets and Boxes: UL 50

Note: Only panelboards containing UL listed devices can be UL labeled.

- National Electrical Code
- NEMA Standards: PB 1
- Federal Specification W-P-115c:
  - Circuit Breakers—Type I Class I
  - Fusible Switch—Type II Class I

UL Listed

Technical Data and Specifications

Panelboard Selection Guide

Panelboard Type	Device Type	Maximum Voltage Rating AC	DC	Maximum Main Rating (Amperes) MLO	Main Device	Branch Circuits Ampere Range	Sub-Feed Breaker Maximum Amperes	AC Interrupting Capacity rms Symmetrical Amperes (kA) Fully Rated	Series Rated
PRL1a	Breaker	240	—	400	400	15–100	400	10–22	22–100
PRL1R	Breaker	240	—	225	225	15–100	—	10–22	22–100
PRL1aF	Fusible	240	—	400	400	15–30	400	200	—
PRL1a-LX	Breaker	240	—	225	225	15–100	—	10–22	22–100
PRL2a	Breaker	240	250	400	400	15–100	400	65	65–200
	Breaker	480Y/277	250	400	400	15–100	400	14	22–150
PRL2R	Breaker	240	—	225	225	15–100	—	10–22	22–200
	Breaker	480Y/277	—	225	225	15–100	—	14	22–100
PRL2aF	Fusible	480Y/277	—	400	400	15–30	400	200	—
PRL2a-LX	Breaker	240	250	225	225	15–100	—	65	65–200
	Breaker	480Y/277	250	225	225	15–100	—	14	22–150
PRL3a	Breaker	240	250	800	600	15–225	600	10–200	22–200
	Breaker	480	250	800	600	15–225	600	14–100	22–150
	Breaker	600	250	800	600	15–225	600	14–35	—
PRL3E	Breaker	240	250	600	600	15–125	400	25–100	100–200
	Breaker	480Y/277	250	600	600	15–125	400	18–65	65–100
	Breaker	480	250	600	600	15–125	400	18–65	65–100
PRL4B	Breaker	240	600	1200	1200	15–1200	—	10–200	22–200
	Breaker	480	600	1200	1200	15–1200	—	14–200	22–150
	Breaker	600	600	1200	1200	15–1200	—	14–200	—
PRL4D	Breaker	240	—	1200	1200 ①	600	—	65–200	—
	Breaker	480	—	1200	1200 ①	600	—	35–100	—
	Breaker	600	—	1200	1200 ①	600	—	18–50	—
PRL4F	Fusible	240	250	1200	1200	30–1200	—	100–200	—
	Fusible	600	250	1200	1200	30–1200	—	100–200	—
PRL5P	Breaker	240	250	1200	1200	15–1200	—	10–200	22–200
	Breaker	480	250	1200	1200	15–1200	—	14–200	22–150
	Breaker	600	250	1200	1200	15–1200	—	14–200	—
PRC100 PRC25	Breaker	240	—	400	400	15–225	—	10–65	22–100
	Breaker	480Y/277	—	400	400	15–225	—	14	65–100
Elevator Control	Fusible	240	—	800	800	15–200	—	200	—
	Fusible	480Y/277	—	800	800	15–200	—	200	—
	Fusible	480	—	800	800	15–200	—	200	—

Note

① Fixed mounted only.

Terminal Wire Ranges, Pressure-Type Al/Cu Terminals Except as Noted

Note: All terminal sizes are based on wire ampacities corresponding to those shown in NEC Table 310.16 under the 75°C insulation columns (75°C wire). The use of smaller size, (in circular mills), regardless of insulation temperature rating, is not permitted.

Where copper-aluminum terminals are supplied on designated panelboard types, best results are obtained if a suitable joint compound is applied when aluminum conductors are used.

Check Eaton's standard terminal sizes versus customer requirements. In particular, 400 and 800A breakers often require nonstandard lugs.

Optional 750 kcmil mechanical screw-type terminals are available upon request. Panelboard dimensions may be affected, refer to Eaton.

Standard Circuit Breaker Terminals

Breaker Type	Ampere Rating	Wire Range
BAB, QBHW, BABRSP, HQP, QPHW	15–70	#14–#4
	90–100	#8–1/0
EDB, EDS, ED, EDH, EDC	100–225	#4–4/0 or #6–300 kcmil
EGB, EGE, EGS, EGH	15–50	#14–3/0 AL/CU
	60–125	#6–3/0 AL/CU
EHD, FDB, FD, HFD, FDC, HFDDC ②	15–100	#14–1/0
	125–225	#4–4/0
FCL	15–100	#14–1/0
GHB, HGHB, GHQ, GHQRSP	15–20	#14–#10
	25–100	#10–1/0
EGB, EGS, EGH	15–50	#14–1/0
	60–125	#6–2/0
JD, HJD, JDC, HJDDC ②	70–250	#4–350 kcmil
DK	250–350	250–500 kcmil
	400	(2) 3/0–250 kcmil or (1) 3/0–500 kcmil
KD, HKD, KDC, HKDDC, ② CKD, CHKD	225	(1) #3–350 kcmil
	350	(2) 3/0–250 kcmil or
	400	(2) 3/0–250 kcmil or (1) 3/0–500 kcmil
LHH	150–400	#2–500 kcmil
	150–400	(2) #2–500 kcmil
	150–400	(1) 500–750 kcmil
LGE, LGH, LGC, LGU, LHH ①	250–400	(1) #2–500 kcmil
	500–600	(2) #2–500 kcmil
LD, HLD, LDC, HLDDC ② CLD, CHLD	300–500	(2) 250–350 kcmil
	600	(2) 400–500 kcmil
MDL, HMDL, HMDLDC ② CMDL, CHMDL	400–600	(2) #1–500 kcmil
	700–800	(3) 3/0–400 kcmil
ND, HND, CND, CHND, NDC, CNDC	800–1000	(3) 3/0–400 kcmil
	1200	(4) 4/0–500 kcmil
LCL	125–225	(1) #6–350 kcmil
	250–400	(1) #4–250 kcmil and (1) 3/0–600 kcmil
FB-P	15–100	#14–1/0
LA-P	70–225	#6–350 kcmil
	250–400	(1) #4–250 kcmil and (1) 3/0–600 kcmil
NB-P, NBDC ②	300–700	(2) #1–500 kcmil
	800	(3) 3/0–400 kcmil

FDPW Switch Terminals

Ampere Rating	Wire Range
30	#14–1/0
60	#14–1/0
100	#14–1/0
200	#4–300 kcmil
400	250–750 kcmil or (2) 3/0–250 kcmil
600	(2) #4–600 kcmil or (4) 3/0–250 kcmil
800	(3) 250–750 kcmil or (6) 3/0–250 kcmil
1200	(4) 250–750 kcmil or (8) 3/0–250 kcmil

Elevator Control Panel Feeder Terminals

Ampere Rating	Wire Range
30	#14–1/0
60	#14–1/0
100	#14–1/0
200	#4–300 kcmil

Notes

① LHH is 400A maximum.

② Suitable for DC applications only.

Enclosed Control (NEMA)

Detail Bill of Material

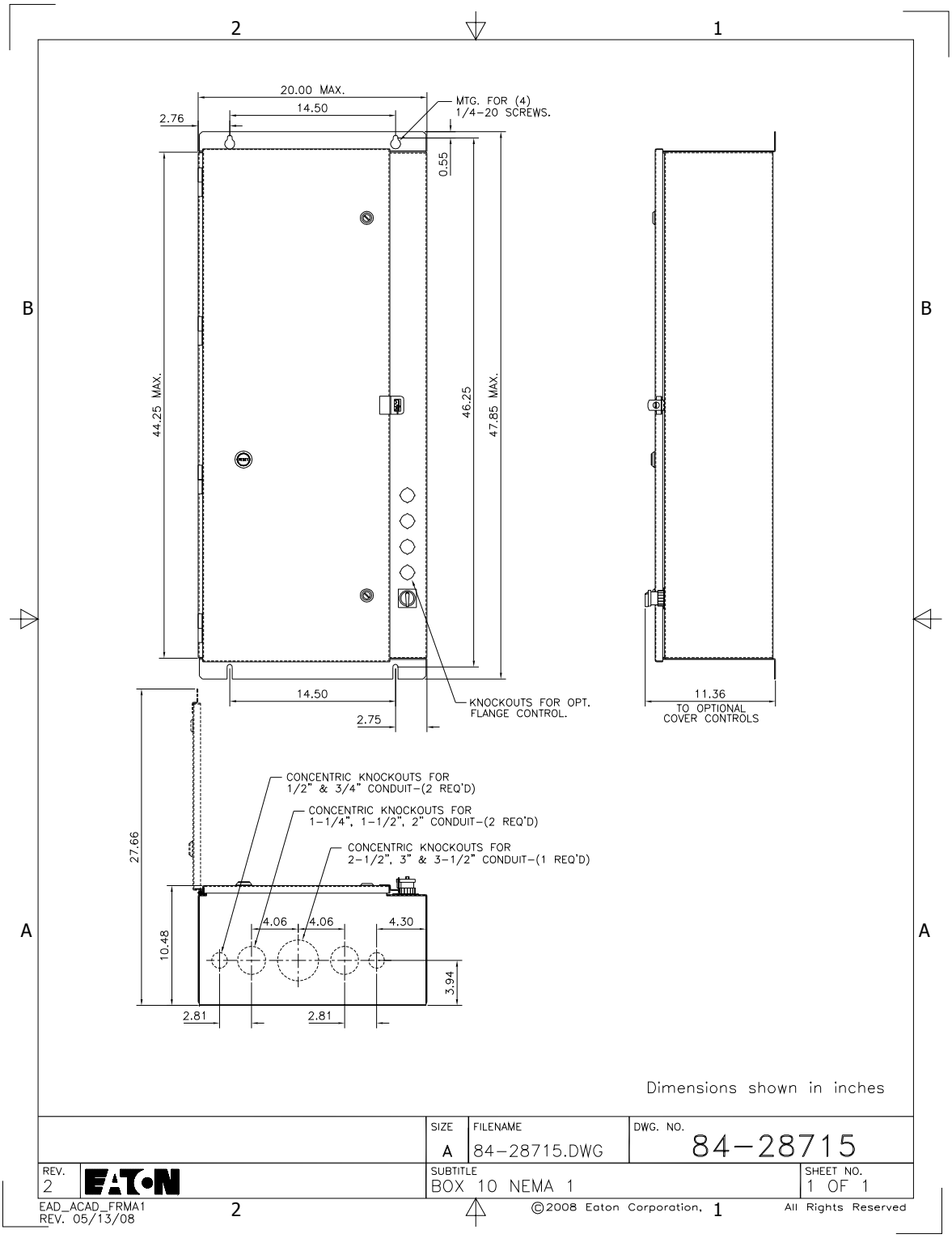
Project Name: Home 2 Flowood
General Order No:
Negotiation No: MH880916X6K3
Alternate No: 0002

Item No.	Qty	Product	Description
	1	Enclosed Controls	ECL03F1A3A, Lighting, NEMA 1 - General Purpose, HP, 208V, Size 200A, Drawing Number: 84-28715, LIST OF MATERIAL:, ECL03F1A3A - Lighting, Electrically Held

Catalog No ECL03F1A3A
Designation 200-3

Eaton Selling Policy None applies.

All orders must be released for manufacture within 90 days of date of order entry. If approval drawings are required, drawings must be returned approved for release within 60 days of mailing. If drawings are not returned accordingly, and/or if shipment is delayed for any reason, the price of the order will increase by 1.0% per month or fraction there of for the time the shipment is delayed.



GO/NEG-Alt-Date:		Job Name:
MH880916X6K3-0002-1/18/2017		Home 2 Flowood
Item Number:	**Catalog Number:**	**Designation:**
	ECL03F1A3A	200-3

UL Rated AC Contactors

Product Description

Eaton's lighting contactors are designed to provide a safe, convenient means for local or remote switching of tungsten (incandescent filament) or ballast (fluorescent and mercury arc) lamp loads. They are also suitable for other loads such as low pressure and high pressure sodium lamp loads and other non-motor (resistive) loads. They are not recommended for most sign flashing loads.

These lighting contactors are designed to withstand the large initial inrush currents of tungsten lamp loads without contact welding. They are fully rated and do not require derating.

Application Description

Loads:

Ballast Lamps—Fluorescent, mercury vapor, metal halide sodium vapor, quartz—600 V maximum.

Filament Lamps—Incandescent, infrared, heating—480 V maximum, line to line; 277 V maximum line to neutral.

Resistance Heating—Radiant and convection heating, furnaces and ovens.

Standards and Certifications

Note: See **Tab 17** for additional information on Standards and Certifications that apply to all Enclosed Control products.

- UL Listed
- cUL Listed
- ABS Type Approved
- OSHPD Certified (OSP-0015-10)

Additional Reference

Catalog Number Selection

Enclosed Lighting Contactors

EC L 12 D 1 A 3 E - X

Design
L = CN35 or A202 lighting contactor
C = C30CN lighting contactor

Class		Page
03	Non-combination electrically held lighting contactor	**V10-T4-6**, **V10-T4-7**
04	Non-combination mechanically held/magnetically latched lighting contactor	**V10-T4-6**, **V10-T4-9**
12	Combination electrically held lighting contactor—fusible disconnect	**V10-T4-11**
13	Combination magnetically latched lighting contactor—fusible disconnect	**V10-T4-11**
14	Combination electrically held lighting contactor—thermal magnetic circuit breaker	**V10-T4-12**
15	Combination magnetically latched lighting contactor—thermal magnetic circuit breaker	**V10-T4-12**

Ampere Size ①		
A = 10 A	**D** = 60 A	**G** = 300 A
B = 20 A	**E** = 100 A	**H** = 400 A
C = 30 A	**F** = 200 A	**J** = 600 A

Enclosure Types
1 = Type 1—General purpose
2 = Type 3R—Rainproof
3 = Type 4—Watertight (painted)
4 = Type 4X—Watertight (304-Grade stainless steel)
6 = Type 7/9—Explosion proof
8 = Type 12—Dust-tight
9 = Type 4X—Watertight (316-Grade stainless steel)

Modification Codes
(See **Pages V10-T4-4** and **V10-T4-5** and **Tab 15**)

Disconnect Fuse Clip Ratings	
A = None	**J** = 200 A / 600 V R
B = 30 A / 250 V R	**K** = 400 A / 250 V R
C = 30 A / 600 V R	**L** = 400 A / 600 V R
D = 60 A / 250 V R	**M** = 600 A / 250 V R
E = 30 A / 600 V R	**N** = 600 A / 600 V R
F = 100 A / 250 V R	**P** = 800 A / 600 V R
G = 100 A / 600 V R	**T** = By description
H = 200 A / 250 V R	

Thermal-Magnetic Breaker Ratings			
A = None	**F** = 60 A	**J** = 300 A	**M** = 800 A
D = 20 A	**G** = 100 A	**K** = 400 A	**T** = By description
E = 30 A	**H** = 200 A	**L** = 600 A	

Number of Poles ②
1, **2**, **3**, **4**, **5**, **6**, **7**, **8**, **9** = Poles required
A = 10 poles
B = 12 poles
C = 20 poles
Combination Devices = Three-pole only

Coil Voltage		
A = 120/60 110/50	**K** = 240/50	**T** = 24/60
B = 240/60 220/50	**L** = 380/50	**U** = 24/50
C = 480/60 440/50	**M** = 415/50	**V** = 32/50
D = 600/60 550/50	**P** = 12 Vdc	**W** = 48/60
E = 208/60	**Q** = 24 Vdc	**X** = 104–120/60
G = 550/50	**R** = 48 Vdc	**Y** = 48/50
H = 277/60	**S** = 125 Vdc	**Z** = By description
J = 208–240/60		

Enclosures

Lighting contactors are available open or mounted in Type 1, 3R, 4, 4X, 12 or 7/9 enclosures.

Type 1 is for indoor, general purpose for personal protection. Knock-outs are provided in the top and bottom for conduit entry.

Type 3R is for outdoor applications and rated for rain, sleet and external ice buildup. Type 3R enclosures have knockouts in the bottom and provisions for a hub in the top.

Type 4 and 4X are for mounting indoor or outdoor and provide protection from splashing water, hose-directed water and wind-blown dust. Watertight conduit hubs are provided in the top and bottom of Type 4X enclosures. The standard Type 4X enclosures are made of 304-Grade stainless steel, providing corrosion protection. 316-Grade stainless steel construction is available as an upgrade option.

Type 12 enclosures are for indoor mounting and protect from dripping liquids, falling dirt and dust. No knockouts or hubs are provided with Type 12 enclosures.

Type 1, 3R, 4 and 12 enclosures are painted with a polyester urethane powder coat paint meeting UL requirements and the color is ANSI 61 gray. Type 1 enclosures have knockouts for cover controls. All the other types have holes plugged, ready for cover controls. Type 7/9 is also available for explosion proof applications. Please contact the factory for additional details.

Notes

① C30CN available in 30 A only.

② For normally closed poles see **Tab 15**.

Type 1, 3R, 4X and 12 Cover Control Non-Combination (Non-Box 1) and Combination Cover Control

		Factory Installed Cover Control		Field Installation Kits	
		Type 1, 3R, 4X and 12	Type 7/9	Type 1 ①②	Type 3R, 4X and 12 Non-Combination and Type 1, 3R, 4X and 12 Combination ②
Description	**For Use with Lighting Contactor**	**Modification Code Suffix**	**Modification Code Suffix**	**Catalog Number**	**Catalog Number**
ON/OFF pushbuttons	Electrical three-wire C30CN; CN35; A202	**P8**	**P8**	**C400GK18**	**C400T2**
With red RUN pilot light		**P8P23**	**P8P23**	**C400GK19_**	—
With red RUN/GREEN off lights		**P8P23P25**	**P8P23P25**	**C400GK1A_**	—
ON/OFF Pushbuttons	Mechanical three-wire C30CN	**P8**	**P8**	**C400GK4**	**C400T201**
With red RUN pilot light		**P8P23**	**P8P23**	**C400GK48_**	—
With red RUN/GREEN off lights		**P8P23P25**	**P8P23P25**	**C400GK49_**	—
ON/OFF pushbuttons	Electrical and mechanical two-wire C30CN; CN35; A202	**P8**	**P8**	**C400GK5**	**C400T14** ③
With red RUN pilot light		**P8P23**	**P8P23**	**C400GK52_**	—
With red RUN/GREEN off lights		**P8P23P25**	**P8P23P25**	**C400GK55_**	—
Start/stop pushbuttons	Mechanical three-wire C30CN	**P7**	**P7**	**C400GK7**	**C400T200**
With red RUN pilot light		**P7P23**	**P7P23**	**C400GK72_**	—
With red RUN/GREEN off lights		**P7P23P25**	**P7P23P25**	**C400GK75_**	—
Start/stop pushbuttons	Electrical and mechanical two-wire C30CN	**P7**	**P7**	**C400GK6**	**C400T13** ③
With red RUN pilot light		**P7P23**	**P7P23**	**C400GK62_**	—
With red RUN/GREEN off lights		**P7P23P25**	**P7P23P25**	**C400GK65_**	—
HAND/OFF/AUTO cover control	Electrical and mechanical two-wire C30CN; CN35; A202	**S3**	**S3** ④	**C400GK3**	**C400T12** ③
With red RUN pilot light		**S3P23**	**S3P23** ④	**C400GK32_**	—
With red RUN/GREEN off lights		**S3P23P25**	**S3P23P25** ④	**C400GK35_**	—
Red RUN pilot light	All	**P23**	**P23**	**C400GK42_**	**C400T9_**
Green OFF pilot light		**P25**	**P25**	**C400GK41_**	**C400T10_**
Red RUN/green OFF pilot light		**P23P25**	**P23P25**	**C400GK46_**	**C400T11_**

Notes

① For use with non-combination units (box sizes 2–4).

② Add code letter from table below to catalog number for voltage in place of _.

Rating	Code Letter	Rating	Code Letter	Rating	Code Letter
24 V 60 Hz	**T**	240 V 60 Hz	**B**	480 V 60 Hz	**C**
120 V 60 Hz	**A**	277 V 60 Hz	**H**	600 V 60 Hz	**D**
208 V 60 Hz	**E**	380 V 60 Hz	**L**		

③ Selector switch.

④ With three-position selector switch, Mod **C20** (two-wire control relay) must be used with magnetically latched contactor (ECL04, ECL13, ECL15).

Class ECL03—Non-Combination Electrically Held Lighting Contactor

No. of Poles	Frame Size	Type 1 General Purpose Catalog Number ①	Type 3R Rainproof Catalog Number ①	Type 4X ② Watertight and Dust-Tight Stainless Steel Catalog Number ①	Type 7/9 Hazardous Location Catalog Number ①	Type 12 Dust-Tight Industrial Catalog Number ①	Component Contactor (Open) Catalog Number ①
Maximum Ampere Rating—10 ③							
2	45 mm	ECL03A1_2A	ECL03A2_2A	ECL03A4_2A	ECL03A6_2A	ECL03A8_2A	CN35AN2_B
3		ECL03A1_3A	ECL03A2_3A	ECL03A4_3A	ECL03A6_3A	ECL03A8_3A	CN35AN3_B
4		ECL03A1_4A	ECL03A2_4A	ECL03A4_4A	ECL03A6_4A	ECL03A8_4A	CN35AN4_B
5		ECL03A1_5A	ECL03A2_5A	ECL03A4_5A	ECL03A6_5A	ECL03A8_5A	—
6		ECL03A1_6A	ECL03A2_6A	ECL03A4_6A	ECL03A6_6A	ECL03A8_6A	—
9		ECL03A1_9A	ECL03A2_9A	ECL03A4_9A	ECL03A6_9A	ECL03A8_9A	—
10		ECL03A1_AA	ECL03A2_AA	ECL03A4_AA	ECL03A6_AA	ECL03A8_AA	—
12		ECL03A1_BA	ECL03A2_BA	ECL03A4_BA	ECL03A6_BA	ECL03A8_BA	—
20		ECL03A1_CA	ECL03A2_CA	ECL03A4_CA	ECL03A6_CA	ECL03A8_CA	—
Maximum Ampere Rating—20 ③							
2	45 mm	ECL03B1_2A	ECL03B2_2A	ECL03B4_2A	ECL03B6_2A	ECL03B8_2A	CN35BN2_B
3		ECL03B1_3A	ECL03B2_3A	ECL03B4_3A	ECL03B6_3A	ECL03B8_3A	CN35BN3_B
4		ECL03B1_4A	ECL03B2_4A	ECL03B4_4A	ECL03B6_4A	ECL03B8_4A	CN35BN4_B
5		ECL03B1_5A	ECL03B2_5A	ECL03B4_5A	ECL03B6_5A	ECL03B8_5A	—
6		ECL03B1_6A	ECL03B2_6A	ECL03B4_6A	ECL03B6_6A	ECL03B8_6A	CN35BN6_B
9		ECL03B1_9A	ECL03B2_9A	ECL03B4_9A	ECL03B6_9A	ECL03B8_9A	CN35BN9_B
10		ECL03B1_AA	ECL03B2_AA	ECL03B4_AA	ECL03B6_AA	ECL03B8_AA	—
12		ECL03B1_BA	ECL03B2_BA	ECL03B4_BA	ECL03B6_BA	ECL03B8_BA	CN35BN12_B
20		ECL03B1_CA	ECL03B2_CA	ECL03B4_CA	ECL03B6_CA	ECL03B8_CA	—
Maximum Ampere Rating—30 ③							
2	45 mm	ECL03C1_2A	ECL03C2_2A	ECL03C4_2A	ECL03C6_2A	ECL03C8_2A	CN35DN2_B
3		ECL03C1_3A	ECL03C2_3A	ECL03C4_3A	ECL03C6_3A	ECL03C8_3A	CN35DN3_B
4		ECL03C1_4A	ECL03C2_4A	ECL03C4_4A	ECL03C6_4A	ECL03C8_4A	CN35DN4_B
5		ECL03C1_5A	ECL03C2_5A	ECL03C4_5A	ECL03C6_5A	ECL03C8_5A	CN35DN5_B
6		ECL03C1_6A	ECL03C2_6A	ECL03C4_6A	ECL03C6_6A	ECL03C8_6A	CN35DN6_B
9		ECL03C1_9A	ECL03C2_9A	ECL03C4_9A	ECL03C6_9A	ECL03C8_9A	CN35DN9_B
10		ECL03C1_AA	ECL03C2_AA	ECL03C4_AA	ECL03C6_AA	ECL03C8_AA	—
12		ECL03C1_BA	ECL03C2_BA	ECL03C4_BA	ECL03C6_BA	ECL03C8_BA	CN35DN12_B
20		ECL03C1_CA	ECL03C2_CA	ECL03C4_CA	ECL03C6_CA	ECL03C8_CA	—
Maximum Ampere Rating—60 ③							
2	65 mm	ECL03D1_2A	ECL03D2_2A	ECL03D4_2A	ECL03D6_2A	ECL03D8_2A	CN35GN2_B
3		ECL03D1_3A	ECL03D2_3A	ECL03D4_3A	ECL03D6_3A	ECL03D8_3A	CN35GN3_B
4		ECL03D1_4A	ECL03D2_4A	ECL03D4_4A	ECL03D6_4A	ECL03D8_4A	CN35GN4_B
5		ECL03D1_5A	ECL03D2_5A	ECL03D4_5A	ECL03D6_5A	ECL03D8_5A	CN35GN5_B
6		ECL03D1_6A	ECL03D2_6A	ECL03D4_6A	ECL03D6_6A	ECL03D8_6A	—
9		ECL03D1_9A	ECL03D2_9A	ECL03D4_9A	ECL03D6_9A	ECL03D8_9A	—
10		ECL03D1_AA	ECL03D2_AA	ECL03D4_AA	ECL03D6_AA	ECL03D8_AA	—
12		ECL03D1_BA	ECL03D2_BA	ECL03D4_BA	ECL03D6_BA	ECL03D8_BA	—

Notes

① For open position (coil voltage), use the table below:

Suffix	Coil Voltage	Suffix	Coil Voltage	Suffix	Coil Voltage
A	120/60 or 110/5	**C**	480/60 or 440/50	**E**	208/60
B	240/60 or 220/50	**D**	600/60 or 550/50	**H**	277/60

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECL03B**4**A2A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Ampere ratings are based on a maximum load voltage of 480 V for tungsten lamp applications and 600 V for ballast or mercury vapor type applications.

Class ECL03—Non-Combination Electrically Held Lighting Contactor, continued

No. of Poles	Frame Size	Type 1 General Purpose Catalog Number ①	Type 3R Rainproof Catalog Number ①	Type 4X ② Watertight and Dust-Tight Stainless Steel Catalog Number ①	Type 7/9 Hazardous Location Catalog Number ①	Type 12 Dust-Tight Industrial Catalog Number ①	Component Contactor (Open) Catalog Number ①
Maximum Ampere Rating—100 ③							
2	90 mm	**ECL03E1_2A**	**ECL03E2_2A**	**ECL03E4_2A**	**ECL03E6_2A**	**ECL03E8_2A**	**CN35KN2_**
3		**ECL03E1_3A**	**ECL03E2_3A**	**ECL03E4_3A**	**ECL03E6_3A**	**ECL03E8_3A**	**CN35KN3_**
4		**ECL03E1_4A**	**ECL03E2_4A**	**ECL03E4_4A**	**ECL03E6_4A**	**ECL03E8_4A**	—
5		**ECL03E1_5A**	**ECL03E2_5A**	**ECL03E4_5A**	**ECL03E6_5A**	**ECL03E8_5A**	—
6		**ECL03E1_6A**	**ECL03E2_6A**	**ECL03E4_6A**	**ECL03E6_6A**	**ECL03E8_6A**	—
9		**ECL03E1_9A**	**ECL03E2_9A**	**ECL03E4_9A**	**ECL03E6_9A**	**ECL03E8_9A**	—
Maximum Ampere Rating—200 ③							
2	180 mm	**ECL03F1_2A**	**ECL03F2_2A**	**ECL03F4_2A**	**ECL03F6_2A**	**ECL03F8_2A**	**CN35NN2_**
3		**ECL03F1_3A**	**ECL03F2_3A**	**ECL03F4_3A**	**ECL03F6_3A**	**ECL03F8_3A**	**CN35NN3_**
4		**ECL03F1_4A**	**ECL03F2_4A**	**ECL03F4_4A**	**ECL03F6_4A**	**ECL03F8_4A**	—
5		**ECL03F1_5A**	**ECL03F2_5A**	**ECL03F4_5A**	**ECL03F6_5A**	**ECL03F8_5A**	—
6		**ECL03F1_6A**	**ECL03F2_6A**	**ECL03F4_6A**	**ECL03F6_6A**	**ECL03F8_6A**	—
Maximum Ampere Rating—300 ③							
2	180 mm	**ECL03G1_2A**	**ECL03G2_2A**	**ECL03G4_2A**	**ECL03G6_2A**	**ECL03G8_2A**	**CN35SN2_**
3		**ECL03G1_3A**	**ECL03G2_3A**	**ECL03G4_3A**	**ECL03G6_3A**	**ECL03G8_3A**	**CN35SN3_**
4		**ECL03G1_4A**	**ECL03G2_4A**	**ECL03G4_4A**	**ECL03G6_4A**	**ECL03G8_4A**	—
5		**ECL03G1_5A**	**ECL03G2_5A**	**ECL03G4_5A**	**ECL03G6_5A**	**ECL03G8_5A**	—
6		**ECL03G1_6A**	**ECL03G2_6A**	**ECL03G4_6A**	**ECL03G6_6A**	**ECL03G8_6A**	—
Maximum Ampere Rating—400 ③④							
2	220 mm	**ECL03H1_2A**	**ECL03H2_2A**	**ECL03H4_2A**	**ECL03H6_2A**	**ECL03H8_2A**	**CN35TN2_**
3		**ECL03H1_3A**	**ECL03H2_3A**	**ECL03H4_3A**	**ECL03H6_3A**	**ECL03H8_3A**	**CN35TN3_**

Notes

① For open position (coil voltage), use the table below:

Suffix	Coil Voltage	Suffix	Coil Voltage	Suffix	Coil Voltage
A	120/60 or 110/5	**C**	480/60 or 440/50	**E**	208/60
B	240/60 or 220/50	**D**	600/60 or 550/50	**H**	277/60

② The catalog numbers listed in the Type 4X column are for Type 4X 304-Grade stainless steel, as indicated by the **seventh** digit. Example: ECL03E**4**A2A. To order Type 4X 316-Grade stainless steel, change that digit to **9**. To order Type 4 painted steel, change that digit to **3**. To order non-metallic, change that digit to **5**. For details on these alternate enclosures, see **Tab 13**.

③ Ampere ratings are based on a maximum load voltage of 480 V for tungsten lamp applications and 600 V for ballast or mercury vapor type applications.

④ UL ballast and resistive ratings only.