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# RQ/RL lighting panel
## Application guide

### Installation
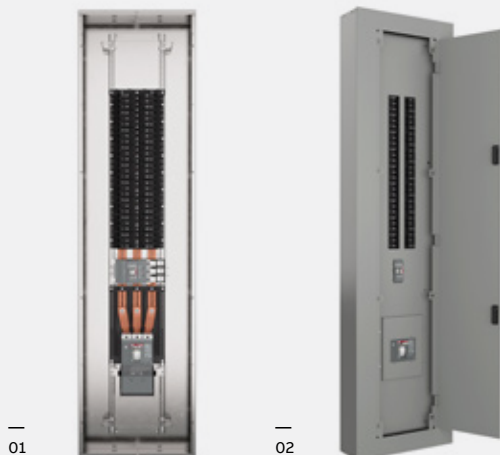Consult instructions NEMA PB-1.1 located in the circuit directory on the front door before installing this panelboard. If necessary, order replacement manual from supplier.

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01 RQ lighting panel
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02 RL lighting panel

### Wiring guidelines (Cu or Al)
- Use 60 °C or 75 °C ampacity sized wire on line and neutral and equipment ground terminals.
- Standard wire sizes listed in this publication may be changed by using alternate terminal kits.
- Refer to circuit breakers for allowable wire temperature rating, wire size and tightening torque.
- Neutral rated for 200% panelboard phase current option.
- Suitable for nonlinear loads, 200% rated neutral, additional "Y" lugs provided for 200% neutral.

### Short circuit current rating
The panelboard's maximum short circuit interrupting rating in rms symmetrical amperes is equal to the lowest interrupting rating of any device installed, except as noted in the series rating listed in 1TQC173100E0001, with integral or remote main circuit breaker or fusible switch installed upstream of the panelboard. Devices to be installed or replacement units shall be from the same manufacturer, of the same type, and have equal or greater interrupting capacity.

Maximum continuous loads on main or branch circuits shall not exceed 80% of the ratings of the listed circuit breakers. Branch breaker straps suitable for 180 A maximum.

### Tripped breaker
If the breaker trips, handle will be in intermediate position.

Instructions to restore power
1. Move handle to OFF position.
2. Then move handle to ON position.

### Seismic rating
Meets or exceeds the requirements according to
**IBC-2018**
Sds = 2.0 g, Ip = 1.5, for z/h = 1.0 in accordance with ICC-ES-AC156 2010
Sds = 2.5 g, Ip = 1.5, for z/h = 0.0 in accordance with ICC-ES-AC156 2010

### Polybag contents
A polybag of goods supplied with every panelboard interior contains:
- Arc flash label
- 1TQC173100E0001 series ratings, wiring diagrams and circuit directory
- Series rating sticker
- Front installation instructions
- ANSI PB1 documentation
- Circuit numbering stickers (1–84)
- Front and shield mounting screws

## Torque

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**Tightening torque**
Applies to line, neutral and equipment ground terminal

| Slotted screw | | | | Internal hex | | | |
|---|---|---|---|---|---|---|---|
| | | | Lb-In | | | | Lb-In |
| AWG wire | Min | Max | | Hex size | Min | Max | |
| 14–10 | 32 | 35 | | ³⁄₁₆ | 108 | 120 | |
| 8 | 36 | 40 | | ¼ | 180 | 200 | |
| 6–4 | 41 | 45 | | ⁵⁄₁₆ | 240 | 275 | |
| 3–2/0 | 45 | 50 | | ⅜ | 330 | 375 | |
| | | | | ½ | 450 | 500 | |

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**Torque values for hardware**

| Screw size | Torque (in-lbs) |
|---|---|
| #4 Steel | 16 |
| #10 Plastic | 16 |
| #8 Cu/Al/steel | 24 |
| #10–32 Cu/Al/steel | 32 |
| ¼–20 Al/<0.150 thick Cu | 44 |
| ¼–20 0.150 thick Cu | 60 |
| ⁵⁄₁₆–18 Cu/Al/steel | 110 |
| ⅜–16 Cu/Al/steel | 220 |
| ½–13 Cu/Al/steel | 220 |

## Lug kits

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**Lug kits for panelboards**

| | Pressure lug kit | | Crimp lug kit | | Pressure lug kit | |
|---|---|---|---|---|---|---|
| Rating | Cat. no. | Wire range Al/Cu | Cat. no. | Wire range Al/Cu | Cat. no. | Wire range Cu only |
| 125 A | MLA1 | 6–350 | MLT1 | 4-300 | MLR1 | 4–350 |
| 225 A | MLA2 | 1/0–250 | MLT2 | 2/0–500 | MLR2 | 1/0–600 |
| 400 A | Standard — MLA41 | 4–600 | MLT41 | 500–750 (Cu only) | MLR41 | 1/0–600 |
| | Oversize — MLA62 | 3/0–800 (main) and 4–600 (neutral) | – | – | – | – |
| 600 A | Standard — MLA61 | 4–500 | – | – | MLR61 | 1/0–600 |

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**Crimp tools**

| Wire | Crimp tool |
|---|---|
| Up to #6–1000 kcmil Cu and #5–750 kcmil Al | Burndy tool Y644HS |

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**Neutral lug Z**

| Holes | Wire size — Cu/Al |
|---|---|
| Large | 2/0–14 |
| Small | No. 4–14 |



**WARNING**

ELECTRICAL ARC FLASH HAZARD

PERSONAL PROTECTION EQUIPMENT REQUIRED

FAILURE TO COMPLY CAN RESULT IN INJURY OR DEATH

REFER TO NFPA 70E          10091352P1

**Article 110.16 Flash Protection, NEC**

Switchboards, panelboards, industrial control panels and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized shall be field marked to warn qualified persons of potential electrical arc flash hazards. The marking shall be located so as to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

Labels available in groups of 10, order 10091352G1

Arc fault label included with all interiors to be applied by electrical contractor.

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# Interrupting ratings — molded case circuit breakers

| Molded case circuit breakers | | | | | UL listed interrupting ratings in kA | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | | | RMS symmetrical AC volts | | | | | |
| Construction | Frame | Trip range (amps) | Pole | Ac | 120 | 120/240 | 240 | 480Y/277 | 480 | 600 |
| HQ frame | THQB | 15–70 | 1 | 120/240 | 10 | 10 | – | – | – | – |
| | THQL | 15–125 | 2 | 120/240 | – | 10 | – | – | – | – |
| | | 15–100 | 2, 3 | 240 | – | – | 10 | – | – | – |
| | THQL-AF | 15–20 | 1 | 120/240 | – | 10 | – | – | – | – |
| | THQL-DF | 15–20 | 1 | 120 | – | 10 | – | – | – | – |
| | THQL-GF | 15–30 | 1, 2 | 120/240 | – | 10 | – | – | – | – |
| | THQL-HID | 15–20 | 1, 2 | 120/240 | – | 10 | – | – | – | – |
| | THQB-GF | 15–30 | 1, 2 | 120/240 | – | 10 | – | – | – | – |
| | THQB-HID | 15–20 | 1, 2 | 120/240 | – | 10 | – | – | – | – |
| | TXQB | 15–30 | 1, 2 | 120/240 | – | 65 | – | – | – | – |
| HHQ frame | THHQB | 15–70 | 1 | 120/240 | – | 22 | 22 | – | – | – |
| | | 15–100 | 2 | 120/240 | – | 22 | 22 | – | – | – |
| | | 15–100 | 3 | 240 | – | – | 22 | – | – | – |
| | THHQL | 15–125 | 2 | 120/240 | – | 22 | – | – | – | – |
| | | 15–100 | 2 | 240 | – | – | 22 | – | – | – |
| | | 15–100 | 3 | 240 | – | – | 22 | – | – | – |
| | THHQL-AF | 15–20 | 1 | 120/240 | – | – | – | – | – | – |
| | THHQL-DF | 15–20 | 1 | 120 | 22 | – | – | – | – | – |
| | THHQL-GF | 15–30 | 1 | 120/240 | – | 22 | – | – | – | – |
| | THHQL-HID | 15–20 | 1, 2 | 120/240 | – | 22 | – | – | – | – |
| | THHQB-GF | 15–30 | 1 | 120/240 | – | 22 | – | – | – | – |
| | THHQB-HID | 15–20 | 1, 2 | 120/240 | – | 22 | – | – | – | – |
| Formula A2 | A2A | 12–225 | 2, 3 | 240 | – | – | 10 | – | – | – |
| | A2N | 12–225 | 2, 3 | 240 | – | – | 25 | – | – | – |
| Tmax® XT | XT1H | 15–125 | 3 | 480 | – | – | 100 | – | – | – |
| | XT1S | 15–125 | 3 | 480 | – | – | 65 | – | – | – |
| | XT4H | 25–250 | 3 | 480 | – | – | 150 | – | – | – |
| | XT4L | 25–250 | 3 | 480 | – | – | 200 | – | – | – |
| | XT4S | 25–250 | 3 | 480 | – | – | 100 | – | – | – |
| | XT5H | 250–400 and 450–600 | 3 | 480 | – | – | 150 | – | – | – |
| | XT5L | 250–400 and 450–600 | 3 | 480 | – | – | 200 | – | – | – |
| | XT5S | 250–400 and 450–600 | 3 | 480 | – | – | 100 | – | – | – |
| | XT6H | 600–800 | 3 | 480 | – | – | 200 | – | – | – |
| | XT6S | 600–800 | 3 | 480 | – | – | 100 | – | – | – |
| | XT6N | 600–800 | 3 | 480 | – | – | 65 | – | – | – |

[1] Not current limiting breaker type

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## Circuit breaker terminals (Cu-Al)

| Frame | | | | Wire Cu-Al (unless otherwise specified) | |
| --- | --- | --- | --- | --- | --- |
| Standard | Current limiting / high interrupting | Poles[2] | Cat. no. | Per lug | Range |
| THQB, TXQB, THHQB, THQL, THHQL, TXQL | – | 1,2,3 | Fixed to breaker terminal | 1 | (15–30 A) #14–4 Cu or #12–4 Al, (35–100 A) #14–10 Cu or #12–1/0 Al |
| XT1 | – | 3 | 1SDA075837R1[3] | 1 | Cu Al 1x10–2/0 AWG |
| XT4–250 A | – | 3 | 1SDA075865R1[3] | 1 | Cu Al 1x3/0 AWG–350 kcmil[4] |
| XT4 (<250 A) | – | 3 | 1SDA075861R1[3] | 1 | Cu Al 1x4 AWG–300 kcmil |
| XT5 | – | 3 | 1SDA113066R1[3] | 2 | Cu Al 2x2/0 AWG–500 kcmil |
| XT5 (750 kcmil) | – | 3 | 1SDA115948R1 | 2 | 500 kcmil – 750 kcmil[5] |
| XT6 | – | 3 | 1SDA113070R1[3] | 3 | Cu Al 3x2/0 AWG–400 kcmil |
| XT6 (750 kcmil) | – | 3 | 1SDA115968R1 | 2 | 500 kcmil – 750 kcmil[5] |
| A2 | – | 3 | 1SDA069983R1[3] (3-pole – 3 pcs lug) | 1 | Cu 1x1 AWG-250 kcmil Al 1x2/0 AWG–300 |
| A2 | – | 2 | 1SDA069982R1[3] (2-pole – 2 pcs lug) | 1 | Cu 1x1 AWG-250 kcmil Al 1x2/0 AWG–300 |

[2] 3-pole XT breakers can be used in 2-pole applications
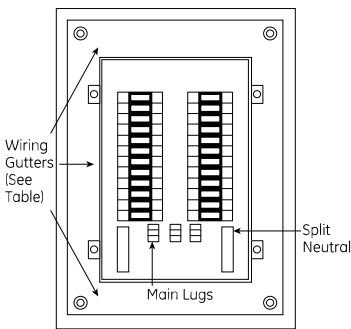[3] Kit contains 3 pcs lug
[4] External solution: lugs to be mounted on EF terminals supplied in the kit
[5] The lug kit will come with 2 sets of cable set screws. One is for 600 kcmil and smaller cable and the other is for cable greater than 600 kcmil. Follow the instructions that are included with the kit. If you are upgrading the existing lugs to the 750 kcmil lugs, the customer, AHJ (authority having jurisdiction) and/or inspector will need to make sure the panel is compliant with NEC and UL cable bending space. ABB is not responsible for the addition of these lugs in existing panels.
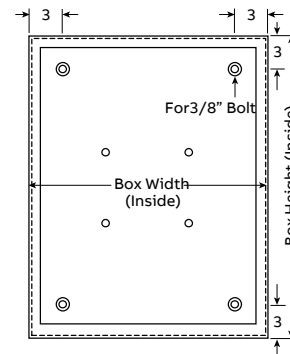
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## Wiring space

### Typical panelboard
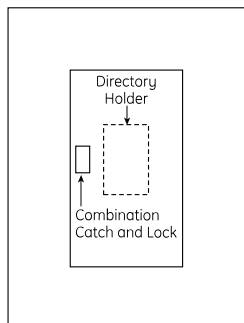Front view with trim removed



### Typical box



### Typical front with concealed hinges and trim adjusting screws
Surface mounting — add ¼" to inside box dimensions
Flush mounting — add 1 ½" to inside box dimensions
ting – add 1 1/2" to inside box



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**Minimum wiring space, from end of lug to box wall, in inches**

| | Main lugs only, to end wall | | | | Main circuit breaker | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | | | | | Phase lug | | |
| Main rating in amps | Phase lug | Neutral lug | Frame type | Mounting | To side wall (20" wide box) | To end wall | Neutral lug |
| 125 A MLO, 100 A main breaker | 6 | 6 | XT1 | Horizontal | 5 | – | 6 |
| 225 A | 12 | 12 | XT4, A2 | Vertical | – | 6 | 12 |
| 400 A | 15 | 11[5] | FG, XT5 | Vertical | – | 15 | 11[5] |
| 600 A | 15 | 11[5] | XT5 | Vertical | – | 16 | – |
| 800 A[6] | 15 | 11[5] | XT6 | Vertical | – | 18 | – |

[5] To side wall
[6] Box width is 30 and 7.81 deep

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**Wiring space — branch circuit breakers**

| Branch circuit devices | Frame | No. of poles | Minimum wiring spaces to side wall (20" wide box) |
|---|---|---|---|
| Double branched bolt-on devices | THQL, THHQL, THQB, THHQB | 1, 2, 3 | 6.5" |
| Horizontal subfeeds single branch mounted | A2, XT1, XT4 | 2, 3 | 5.5" |

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**Enclosures**

| Panel size | Cat. no.[7] | Box Size inches[8] | Front cat. no.[9] |
|---|---|---|---|
| 0–25.5 | AB25B | 25.5 | AF25F,S |
| 28.5–31.5 | AB31B | 31.5 | AF31F,S |
| 34.5–37.5 | AB37B | 37.5 | AF37F,S |
| 40.5–43.5 | AB43B | 43.5 | AF43F,S |
| 46.5–49.5 | AB49B | 49.5 | AF49F,S |
| 52.5–55.5 | AB55B | 55.5 | AF55F,S |
| 57.5–64.5 | AB64B | 64.5 | AF64F,S |
| 67.5–76.5 | AB76B | 76.5 | AF76F,S |

[7] B suffix provides blank end walls. Order K suffix for end walls with knockouts.
[8] Standard boxes are 20 wide by 5.81 deep.
[9] Flush fronts are 1½ larger than box. Surface fronts are ¼ larger.

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**Front options**

| Description | Cat. no. suffix[10] |
|---|---|
| Front hinged to box | D |
| Yale 5116 with Rosette Lock | Y |
| Corbin 15767 lock | L |
| 75 key lock | E |
| Corbin 60 key lock | J |
| Quarter-turn lock | T |
| Door-within-a-door[11] | P |
| Stainless steel[12] | S |
| 30" wide | W |
| Nameplate | N |
| Screw-on nameplate | U |
| Metal directory | M |

[10] Add to base front catalog number.
[11] Consists of two lockable doors—one over panel interior and one over box wiring gutters. Yale locks not available.
[12] Flush only. Available with C and N options.

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**Box options**

| Description | Cat. no. suffix[13] |
|---|---|
| Painted box | P |
| 30" wide[14] | W |
| NEMA 3R/12/4S/4X | 3 or 4 |
| NEMA 3RX door-in-door | 3M |
| NEMA 4X (316 stainless steel) | 4S |

[13] Add to base box product number.
[14] Includes field installable gutter barrier.

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**Permanent circuit number kits**

| Description | Cat. no. |
|---|---|
| 1–48 | APN48 |
| 43–84 | APN84 |
| 85–126 | APN126 |

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**Stainless steel enclosures**

| Dimensions (inches) | | | | Cat. no. |
|---|---|---|---|---|
| H | W | D | UL standard | CSA labeled |
| 25.5 | 20 | 6 | AB254S | AB254AS |
| 25.5 | 30 | 8 | AB254DWS | AB254DWAS |
| 31.5 | 20 | 6 | AB314S | AB314AS |
| 31.5 | 30 | 8 | AB314DWS | AB314DWAS |
| 37.5 | 20 | 6 | AB374S | AB374AS |
| 37.5 | 30 | 8 | AB374DWS | AB374DWAS |
| 43.5 | 20 | 6 | AB434S | AB434AS |
| 43.5 | 30 | 8 | AB434DWS | AB434DWAS |
| 49.5 | 20 | 6 | AB494S | AB494AS |
| 49.5 | 30 | 8 | AB494DWS | AB494DWAS |
| 55.5 | 20 | 6 | AB554S | AB554AS |
| 55.5 | 30 | 8 | AB554DWS | AB554DWAS |
| 64.5 | 20 | 6 | AB644S | AB644AS |
| 64.5 | 30 | 8 | AB644DWS | AB644DWAS |
| 76.5 | 20 | 6 | AB764S | AB764AS |
| 76.5 | 30 | 8 | AB764DWS | AB764DWAS |

# Accessories
Field-installed kits/replacement parts

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### Filler plates

| Breaker type | Cat. no. |
|---|---|
| THQB/THHQB/THQL THHQL/TEY | TQLFP1 |
| FB | TEDFP1 |

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### End wall kits
Field installed. 1 each, for standard 20" w x 5.81" d boxes.

| Type | Cat. no. |
|---|---|
| Blank | ABEW2 |
| Knockout | ABEW2 |

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### Equipment grounds



AEBG



AEIG



ASPGIBC



AEBGC



AEIGC

| Item | Description | Wire range | Cat. no. |
|---|---|---|---|
| Metal equipment ground | Bonded | #14-#8 Cu, #12-#8 Al (small holes); #14-#4 Cu, #6-#4 Al (large holes) | TGL2 |
| | Extruded bonded | #14-#8 Cu, #12-#8 Al (small holes); #14-#4 Cu, #6-#4 Al (large holes) | EGS12 |
| Aluminum equipment ground | Extruded bonded | (1) #6-350 MCM | AEBG |
| | Extruded isolated | (2) #6-250 MCM | AEIG |
| | Main lug | #14-#8 Cu, #12-#8 Al (small holes); #14-#4 Cu, #6-#4 Al (large holes) | TGL2 |
| Copper equipment ground | Bonded | #14-#8 Cu, #12-#8 Al (small holes); #14-#4 Cu, #6-#4 Al (large holes) | TGC2 |
| | Extruded bonded | #14-#8 Cu, #12-#8 Al (small holes); #14-#4 Cu, #6-#4 Al (large holes) | AEBGC |
| | Extruded isolated | (1) #4-350 kcmil | AEIGC |
| | Insulated isolated | (1) #6-250 kcmil | ASPGIBC |

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### Bonding kits

| Description | Cat. no. |
|---|---|
| For split and load end neutral | 343L886G16 |
| For 225 A horizontal neutrals | 343L886G13 |
| 225 A horizontal neutral to convert 3W to 4W | ASP225HNCP |
| 125/225 A horizontal neutral conversion from service entrance to non-service entrance | ASPHNCPSENOT |
| 125/225 A horizontal neutral to convert from non-service entrance to service entrance | ASPHNCPSE |

## Installation and maintenance kit
Order catalog number PROCARE. Kit includes:
- (5) filler plate hardware kits
- (9) bus stud nuts
- (5) MLA1 filler plates
- (2) 225 A phase barriers
- (2) feed-thru barriers
- (1) 400/600 A phase barrier
- (50) directory cards/rating books
- (50) circuit number strips (1–48)
- (50) circuit number strips (43–84)
- (5) standard locks and keys
- (50) deadfront screws
- (10) RQ/RE front hardware kits
- (10) RD front hardware kits
- (50) service disconnect labels
- (50) main labels

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### Parts

| Description | Cat. no. |
|---|---|
| Directory card | 139C5612P3 |
| Replacement lock with standard key | 569B737P1 |
| Replacement lock with GE75 key | 569B737P2 |
| Additional keys for above lock | 569B737P5 |
| Circuit numbering strips 1–48 | 569B806G1 |
| Circuit numbering strips 49–84 | 569B806G2 |
| Circuit numbering strips 85–126 | 569B806G3 |
| Adhesive backed lamicoid nameplate ¾ x 3 | 315A7190P1 |
| Metal directory card holder | 139C5491G1 |
| Directory card holder | 139C5491P4 |
| Delta hi-leg conversion kit, to add B-phase plug on AL panels | APHBL |
| Bolt-on RE/RQ panels | APHBQ |
| NEMA 3R/12 tamper-proof tork screw kit | NEMATRX |
| 2-pole to 3-pole TQD conversion kit | ASP2PTQD3P |
| 2-pole to 3-pole conversion kit for horizontal subfeed | ASP2PTFJ3P |
| RD 25 to 65 kAIC barrier kit | ASP25AD65KA1 |
| Service entrance kit | ASPSERENT |
| 2-wire relay kit | ASP2WRelay |
| Yale lock kit | ASPYALE47 |
| Corbin lock kit | ASPCORBNTEU1 |
| 2–3 pole TQD mechanical interlock | TQDFM1 |
| RQ/RL/RE rail bracket | ASPAQLEBKT |
| Front flush adjust kit | ASPFLUSHADJ |
| RE front-mounting kit | 139C5720G3 |
| RQ/RL front-mounting kit | 139C5720G6 |
| RD front-mounting kit | 139C5728G9 |
| Front hinge-to-box mounting kit | 139C5700G6 |
| Front extension mounting kit | 139C5700G11 |

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**Box extensions**
Bolts to box with or without end wall in place. Extensions can be combined to obtain lengths greater than 18 and 24 inches.

| Box width and depth | Box mounting | Box extension length (inches) | Cat. no. |
|---|---|---|---|
| 20 x 5.81 | Flush | 9 | ABX2509F |
| | | 18 | ABX2518F |
| | | 24 | ABX2524F |
| | Surface | 9 | ABX2509S |
| | | 18 | ABX2518S |
| | | 24 | ABX2524S |
| | | 37 | ABX2537S |
| | | 43 | ABX2543S |
| | | 49 | ABX2549S |
| | | 55 | ABX2555S |
| | | 64 | ABX2564S |
| | | 76 | ABX2576S |
| 30 x 5.81 | Flush | 18 | ABX3518F |
| | | 24 | ABX3524F |
| | Surface | 18 | ABX3518S |
| | | 24 | ABX3524S |
| 30 x 7.81 | Flush | 18 | ABX3718F |
| | | 24 | ABX3724F |
| | Surface | 18 | ABX3718S |
| | | 24 | ABX3724S |

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**Box extension covers only**
10 covers per kit

| Description | Cat. no. |
|---|---|
| 9 covers surface | ASPABX09S |
| 9 covers flush | ASPABX09F |
| 18 covers surface | ASPABX18S |
| 18 covers flush | ASPABX18F |
| 64 to 76 covers surface | ASPABX20S |
| 64 to 76 covers flush | ASPABX20F |

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# Specifications

Panelboards and branch breakers meet or exceed the following standards and specifications:
- National Electrical Code — Article 384
- UL 67 panelboards: UL 50 cabinets and boxes. UL 943 GFCI
- UL 489 molded case circuit breakers. UL 98 fusible switches
- cUL listing for ReliaGear™ lighting panelboards
- CSA listing for ReliaGear non-service entrance panelboards
- International Building Code Seismic Zone 3 and 4
- California Building Code Seismic Zone 4
- NEMA PB1
- Federal Specifications — Panelboards, W-P-115c. Type 1 — Circuit breaker equipped
- Class 1 — Panelboards Class 2 — Load centers
- Molded case circuit breakers, WC-375B/GEN. — Fusible switches, W-S-865c

**Boxes**
- Galvaneal painted and 316 stainless steel offerings
- Blank end walls are standard; knockouts are available when specified with NEMA 1 enclosures only
- Boxes furnished with provisions for ground bus as standard

**Fronts**
- Finished in ANSI-61 gray polyester powder coat paint
- Equipped with corrosion-resistant Valox combination catch and lock door latch (doors over 48" high provided with 2 latches)
- Equipped with concealed hinges and trim adjusting screws
- Directory holder permanently mounted to door

**Panels**
- Dead-front construction
- Interiors are factory assembled on rigid steel frames
- Metal gauges in accordance with UL and NEMA standards
- Solderless, anti-turn main lugs suitable for copper or aluminum wires are front removable and branch straps are silver-plated copper fully rated at 100 amperes
- Main bus is aluminum with copper branch connections unless otherwise specified
- Main disconnect device is identified when supplied, and numbers are provided for branch circuits
- Interior base assemblies are Noryl and provide breaker mounting and busbar insulation

| Publications | |
|---|---|
| E-DET-465 | Certification of seismic compliance |
| 1TQC173100E0003 | RQ/RL lighting panel application guide |
| 1TQC173100E0001 | Lighting panels rating labels, wiring diagrams and circuit directory |