Features

Flexibility is the hallmark of the P2 panel. This panel offers a wide array of factory-assembled options to meet almost all lighting panel applications. With this design, the ability to mix breaker frames in unit space up to 250 amps will also meet many distribution panel requirements in a much smaller package. Bussing options for the P2 vary from the typical temperature rated to 750 A/Si aluminum to 1000A/Si copper. Standard bussing in the P2 panel is tin-plated. Silver-plated copper is also offered as an option. Integrated time clocks, bus mounted contactors, as mains or sub mains, split bus, and subfeed lugs (up to 400 amp) are just a few of the options of this unique panel.

Like a lighting panel, P2 is set up around 18, 30, 42, 54, 66, 78, and 90 circuit configurations. It will also allow the user to configure the panel to the smallest possible size. The P2 panel starts with 9" of unit space (18 circuits of 1" pole breakers). Breakers mounted in unit space can be mixed and matched to meet customer requirements. All 1" pole breakers (BL, BQD, ED frames) are mounted in 3" or 6" pole increments. Breaker frames, above 125 amps, are mounted in 6" single breaker mountings.

As an example of a minimum panel, (6) 20 amp 1-pole BL breakers (3" of unit space) and a 3-pole 225 amp QJ breaker (6" of unit space) equaling 9" of unit space can be configured in a P2 panel without any extra provisions or space required. FD 250 amp and JD 400 amp breakers are mounted as subfeed breakers outside of unit space.

Another unique feature of the P2 panel is that blank unit space can be added to allow for future expansions or modifications. Any expansions or modifications must be in 3" increments. BL, BQD, and ED frame breakers have 3" or 6" pole kits, and can be mixed in unit space by these increments. Breakers of the same frame can cross from one mounting to another if contiguous. QR frame breakers are mounted in 6" increments for two- and three pole, single mounted units. Changes in the unit space length for BL, BQD, or ED frame breakers require an addition deadfront, center strip kit. Check with sales or the factory for additional unit space kits.

Main Lug / Main Breaker

Enclosure – Standard Type 1 enclosure is 20" wide x 5.75" deep X. Box Height is determined by main device and unit space. See charts for box height.

Voltage – 600V AC max.
250V DC max.

Amperage – 600 amp max.

Short circuit rating – 200 KAIC max. symmetrical or equal to the lowest rated device installed unless a series rating is indicated. Panels with subfeed or feed-thru lugs without a main device, circuit breaker or fusible unit, are limited to a three-cycle rating. The three-cycle rating for the P2 panel is limited to 22 KAIC. Note that the main device may be mounted remote from the panel.

Bussing – The P2 panel has more options to meet market requirements. The standard bussing is temperature rated aluminum. The rating is per the requirements of UL 67 – the standard for panelboards. All aluminum bussing is tin-plated. Optional bussing for the P2 panel is: 750 A/Si aluminum, temperature rated copper, and 1000 A/Si copper. The copper bus option for this panel is tin-plated.

Weight – Approximate
Total panelboard weight when filled with a normal quantity of breakers and accessories is about 3 lbs. (1 kg) per inch (54g per mm) of box height.

Gauge Steel of Boxes Fronts, Surface and Flush

Dimensions in inches (mm)		Gauge Steel	
Width	Height	Box	Front
20 (508)	26–74 (660–1880)	#16	#14

Standard Circuit P2 Panels

Base Box Size Requirements for P2 Panels with Standard Line Lugs, and fewer than 55 poles of 1" module (BL,BQD, ED, xGB) branch breakers and provisions. Unit Spaces range from 9" to 45" (in 6" increments). Boxes range from 26" to 74" high (in 6" increments). Inclusion of optional modifications may require size increases that must be added to these base values to calculate the final box size for the panel (see pages 11-32, 11-35). Vertical Main breaker options with the "Vert." designation are added-price options (see page 11-29). Values in brackets [ ], at the bottom of each column, indicate the maximum allowable 1" module branch poles for each main type.

"B" Dimension Box Height	P2 Panels with Standard Line Lugs. Unit Space (starting with 9" and adding 6" increments) "A" Dimension														
	Main Lugs			Main Breakers											
	125A	250A	400A 600A	125A Horiz. BL, BQD, xGB, ED	125A Vert. ED①	125A Horiz. CED	225A Horiz. QJ/QR	225A Vert. QJ/QR①	250A Horiz. FD	250A Vert. FD①	250A CFD	400A JD	400A CJD	600A LD	600A CLD
26	9	—	—	9	—	—	—	—	—	—	—	—	—	—	—
32	15	9	—	15	9	9	9	—	—	—	—	—	—	—	—
38	21	15	9	21	15	15	15	9	9	—	—	—	—	—	—
44	27	21	15	27	21	21	21	15	15	9	—	—	—	—	—
50	27	27	21	27	27	27	27	21	21	15	9	9	—	—	—
56	39	27	27	39	33	33	33	27	27	21	15	15	—	9	—
62	45	39	33	45	39	39	39	33	33	27	21	21	9	15	9
68	45	45	39	45	45	45	45	39	39	33	27	27	15	21	15
74	45	45	45	45	45	45	45	45	45	39	33	33	21	27	21
	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[54p]	[42p]	[54p]	[42p]

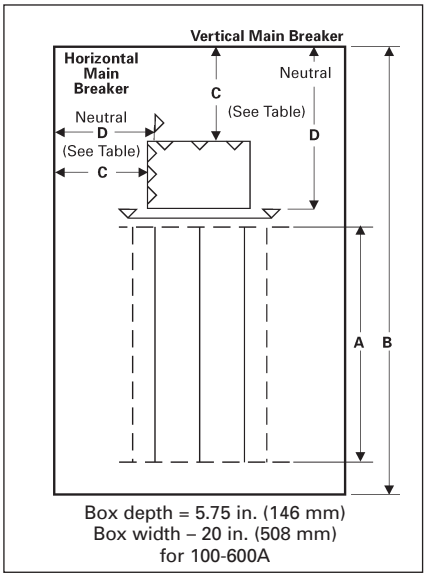
Extended Circuit P2 Panels

Base box size requirements for Extended Circuit P2 Panels with Standard Line Lugs, and 55 or more poles of 1" module (BL,BQD, ED, xGB) branch breakers and provisions. Unit Spaces range from 33" to 45" (in 6" increments). Boxes range from 56" to 74" high (in 6" increments). Inclusion of optional modifications may require size increases that must be added to these base values to calculate the final box size for the panel (see pages 11-32, 11-35). Vertical Main breaker options with the "Vert." designation are added-price options (see page 11-29). Values in brackets [ ], at the bottom of each column, indicate the maximum allowable 1" module branch poles for each main type.

"B" Dimension Box Height	P2 Panels with Standard Line Lugs. Unit Space (starting with 9" and adding 6" increments) "A" Dimension														
	Main Lugs			Main Breakers											
	125A	250A	400A 600A	125A Horiz. BL, BQD, xGB, ED	125A Vert. ED①	125A Horiz. CED	225A Horiz. QJ/QR	225A Vert. QJ/QR①	250A Horiz. FD	250A Vert. FD①	250A CFD	400A JD	400A CJD	600A LD	600A CLD
56	33	—	—	33	—	—	33	—	—	—	—	—	—	—	—
62	39	33	33	39	33	33	39	33	—	—	—	—	—	—	—
68	45	39	39	45	39	39	45	39	33	—	—	—	—	—	—
74	45	45	45	45	45	45	45	45	39	33	—	33	—	—	—
	[90p]	[90p]	[90p]	[90p]	[90p]	[90p]	[90p]	[90p]	[78p]	[66p]	[54p]	[66p]	[42p]	[54p]	[42p]

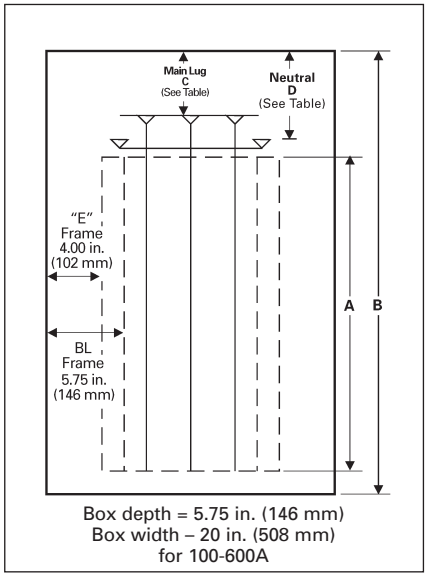
① Note: The vertical main breaker application for ED, QJ, QR, and FD adds 6" of box height.

Main breaker wire bending space diagram



Box depth = 5.75 in. (146 mm)
Box width – 20 in. (508 mm)
for 100-600A

Main lug wire bending space diagram



Box depth = 5.75 in. (146 mm)
Box width – 20 in. (508 mm)
for 100-600A

Standard Circuit P2 Panels

Main Breaker Wire Bending

Standard Circuits (up to 54 1" module branch poles)			
Panel Amps	**Breaker Frames**	**C①**	**D①**
100	BL	5.75	8.00
	BQD	5.13	8.00
125	NGB, HGB, LGB	4.63	8.00
	ED (horiz.)	4.00	8.00
	ED (vert.)	6.56	11.13
225	QJ/QR (horiz.)	5.00	7.00
	QJ/QR (vert.)	10.06	16.69
250	FD (horiz.)	5.00	7.00
	FD (vert.)	13.25	22.72
400	JD	15.38	25.00
600	LD	15.38	23.00

Main Lug Connectors

Standard Circuits (up to 54 1" module branch poles)			
Panel Amps	**Standard Connectors**	**C①**	**D①**
125	(1) #14-2/0	6.62	8.19
250	(1) #6 AWG - 350 MCM	11.75	10.72
400	(1) #4 AWG - 600 MCM or (2) #6 - 250 MCM	14.00	13.09
600	(2) #4 AWG - 500 MCM	14.00	11.00

Extended Circuit P2 Panels

Main Breaker Wire Bending

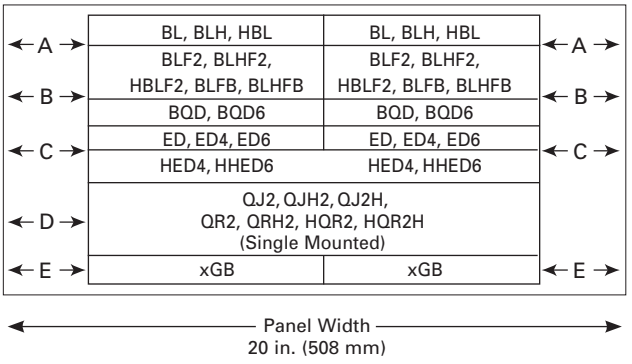
Extended Circuits (more than 54 1" module branch poles)			
Panel Amps	**Breaker Frames**	**C①**	**D①**
100	BL	5.75	6.56
	BQD	5.13	6.56
125	NGB, HGB, LGB	4.63	6.56
	ED (horiz.)	4.00	6.56
	ED (vert.)	12.56	14.88
225	QJ/QR (horiz.)	5.00	6.44
	QJ/QR (vert.)	10.06	15.53
250	FD (horiz.)	5.00	5.63
	FD (vert.)	19.25	25.71
400	JD	15.38	23.75
600	LD (54p max)	N/A	N/A

Main Lug Connectors

Extended Circuits (more than 54 1" module branch poles)			
Panel Amps	**Standard Connectors**	**C①**	**D①**
125	(1) #14-2/0	12.62	8.91
250	(1) #6 AWG - 350 MCM	17.75	13.69
400	(1) #4 AWG - 600 MCM or (2) #6 - 250 MCM	14.00	14.19
600	(2) #4 AWG - 500 MCM	14.00	14.23

Branch Breaker Side Gutters Inches (mm)

Reference Letter	Panel Width 20" (508)
A	5.750 (146)
B	5.125 (130)
C	4.000 (102)
D②	5.000 (127)
E	4.625 (117)



① Refer to diagrams at the bottom of page 11-27.
② Single branch mounting construction.

Main Breaker Selection①

Ampere Rating	Breaker Type	Max. Interrupting Rating (kA) 240V	480V	600V	Ref. Catalog No.	Available Trip Values
100	BL	10	—	—	BL	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	HBL	65	—	—	HB	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	BQD	65	14	—	BQ	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	BLH	22	—	—	BH	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	ED4	65	18	—	E4	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	NGB	100	25	14	NB	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 100
	HGB	100	35	14	G2	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 100
	LGB	100	65	14	G3	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 100
	ED6	100	25	14	E6	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	HED4	100	42	—	H4	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	HHED6	100	65	18	HA	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	CED6②	200	200	100	CE	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
125	NGB	100	25	14	NB	110, 125
	HGB	100	35	14	G2	110, 125
	LGB	100	65	14	G3	110, 125
	ED4	65	18	—	E4	125
	ED6	65	25	18	E6	125
	HED4	100	42	—	H4	125
	HHED6	100	65	18	HA	125
	CED6②	200	200	100	CE	125
225	QJ2	10	—	—	QJ	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	QJH2	22	—	—	QH	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	QJ2H	42	—	—	Q2	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	QR2	10	—	—	QR	100, 110, 125, 150, 175, 200, 225
	QRH2	25	—	—	Q4	100, 110, 125, 150, 175, 200, 225
	HQR2	65	—	—	Q5	100, 110, 125, 150, 175, 200, 225
	HQR2H	100	—	—	Q6	100, 110, 125, 150, 175, 200, 225
	FD6	65	35	18	FD	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	FXD6	65	35	18	FX	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	HFD6	100	65	25	HF	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	HFXD6	100	65	25	H2	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	CFD6②	200	200	100	CF	70, 80, 90, 100, 110, 125, 150, 175, 200, 225
250	FD6	65	35	18	FD	250
	FXD6	65	35	18	FX	250
	HFD6	100	65	35	HF	250
	HFXD6	65	35	25	H2	250
	CFD6②	200	150	100	CF	50
400	JXD6②	65	35	25	JX	200, 225, 250, 300, 350, 400
	JD6②	65	35	35	J6	200, 225, 250, 300, 350, 400
	HJXD6②	100	65	35	H6	200, 225, 250, 300, 350, 400
	HJD6②	100	65	35	H5	200, 225, 250, 300, 350, 400
	SJD6②	65	35	25	SJ	200, 300, 400
	SHJD6②	100	65	35	S2	200, 300, 400
	CJD6②	200	200	100	CJ	200, 300, 400
	SCJD6②	200	200	100	SC	200, 300, 400
600	LXD6②	65	35	25	LX	450, 500, 600
	LD6②	65	35	25	L6	250, 300, 350, 400, 450, 500, 600
	HLXD6②	100	65	35	HL	250, 300, 350, 400, 450, 500, 600
	HLD6②	100	65	35	HO	250, 300, 350, 400, 450, 500, 600
	SLD6②	65	35	25	SL	300, 400, 500, 600
	SHLD6②	100	65	35	S6	300, 400, 500, 600
	CLD6②	200	150	100	CL	300, 400, 500, 600
	SCLD6	200	150	100	C6	300, 400, 500, 600

When an ED4, ED6, HED4, QJ2, QJH2, QJ2H, QR2, QRH2, HQR2, HQR2H, FD6, HFD6, or FXD6 frame main breaker, vertically mounted, is required, price as a main breaker panel and add from the table for the main breaker mounting.

Vertically Mounted Main Breaker (available in 2-pole or 3-pole)

Ampere Rating	Breaker Type(s)	Unit Space (in.)
100	ED4, ED6, HED4	6
225	QJ2, QJH2, QJ2H, FXD6, FD6, HFD6 QR2, QRH2, HQR2, HQR2H	6

Subfeed Breakers (available in 2-pole or 3-pole)

Breaker Type	Mounting Position When Used as Subfeed Breaker	Ampere Ratings For Load	Maximum Interrupting Rating (kA) Symmetrical		
	Vertical		240V AC	480V AC	600V AC
FD6③, FXD6	Twin	70–250	65	35	22
HFD6③, HFXD6	Twin	70–250	100	65	25
JD6④, JXD6	Single	200–400	65	35	25
HJD6④, HJXD6	Single	200–400	100	65	35

① Interchangeable trip main breakers are mounted at top of panel only.
② Vertically mounted.
③ Twin mounted subfeed breakers are mounted at the bottom of panelboard only and adds 24" to the panel height.
④ Subfeed breaker is mounted at bottom of panelboard only. 400 amp subfeed breaker adds 24" to the panel height. (Only for use with MLO)

Branch Circuit Breakers

Max. Amp Rating	Bolt-On Breaker Type	Amps	Availability			Maximum Interrupting Rating (kA)						
			1-Pole	2-Pole	3-Pole	120V AC	120/240V AC	240V AC	277V AC	480V AC	600V AC	250V DC
100	BL	15–60	√	√	√	10	—	—	—	—	—	—
		70	√	√	√	—	10	—	—	—	—	—
		80–100	—	√	√	—	—	10	—	—	—	—
	BLH	15–60	√	√	√	—	22	—	—	—	—	—
		70	√	√	√	—	22	—	—	—	—	—
		80–100	—	√	√	—	—	22	—	—	—	—
	HBL	15–55	√	√	√	—	65	—	—	—	—	—
		60–100	—	√	√	—	65	—	—	—	—	—
	BL, HID	15–30	√	√	—	10	10	—	—	—	—	—
	BLR (240V)	15–60	—	√	—	—	—	10	—	—	—	—
		70–100	—	√	—	—	—	10	—	—	—	—
	BLE (GFCI)	15–30	√	√	—	10	—	—	—	—	—	—
		40–60	—	√	—	—	10	—	—	—	—	—
	BLEH	20–30	√	—	—	22	—	—	—	—	—	—
		15–60	√	√	—	—	22	—	—	—	—	—
	BLF (GFCI)	15–30	√	√	—	10	—	—	—	—	—	—
		40–60	√	√	—	—	10	—	—	—	—	—
	BLHF (GFCI)	15–30	√	√	—	22	—	—	—	—	—	—
		40–60	√	√	—	—	22	—	—	—	—	—
	HBLF2 (GFCI)	15–30	√	—	—	65	—	—	—	—	—	—
	BGL②	15–30	—	√	√	10	10	—	—	—	—	—
	BAF	15–20	√	√	—	10	—	—	—	—	—	—
	BAFH	15–20	√	√	—	22	—	—	—	—	—	—
	BQD	15–60	√	√	√	—	65	—	14	—	—	14
		70–100	√	√	√	—	65	—	—	14	—	14
125	NGB	15–60	√	√	√	100	100	100	25	25	14	14④
		70–100	√	√	√	100	100	100	25	25	14	14④
		110–125	—	√	√	100	100	100	25	25	14	14④
	HGB	15–60	√	√	√	100	100	100	35	35	14	14④
		70–100	√	√	√	100	100	100	35	35	14	14④
		110–125	—	√	√	100	100	100	35	35	14	14④
	LGB	15–60	√	√	√	100	100	100	65	65	14	14④
		70–100	√	√	√	100	100	100	65	65	14	14④
		110–125	—	√	√	100	100	100	65	65	14	14④
	ED4	15–60	√	√	√	65	—	—	22	—	—	—
		70–100	√	√	√	—	—	65	—	18	—	30
		110–125	—	√	√	—	—	65	—	18	—	—
	ED6	15–60	—	√	√	—	—	65	—	25	18	30
		70–100	—	√	√	—	—	65	—	25	18	—
		110–125	—	√	√	—	—	65	—	25	18	—
	HED4①	15–60	√	√	√	—	—	65	—	42	18	30
		70–100	√	√	√	—	—	65	—	42	18	—
		110–125	—	√	√	—	—	65	—	42	18	—
225	QJ2	60–225	—	√	√	—	—	10	—	—	—	—
	QJH2	60–225	—	√	√	—	—	22	—	—	—	—
	QJ2H	60–225	—	√	√	—	—	42	—	—	—	—
	QR2	100–225	—	√	√	—	—	10	—	—	—	—
	QRH2	100–225	—	√	√	—	—	25	—	—	—	—
	HQR2	100–225	—	√	√	—	—	65	—	—	—	—
	HQR2H	100–225	—	√	√	—	—	100	—	—	—	—

Branch Device Limitations

Lighting and appliance branch circuit panelboards were included in editions of the National Electrical Code prior to 2008. By application rule (408.15 in all versions of the NEC prior to 2008), lighting and appliance panels are limited to 42 installed circuits. Each over current device pole counts as a circuit.

Branch Neutral Connections

Wire Range	Max. Number of Connections	Max. Amp③
#14-#6	26	65
#14-1/0	28	125
#6-350 kcmil	3	250
(1) #4-600 kcmil or (2) #6-250 kcmil	1	400

① 1-Pole HED 4 15–30A Rated 65kA 35 through 100A Rated 25kA.
② Two pole breaker is one phase and neutral. Three pole is two phase and neutral.
③ Based on 75 degree copper.
④ 2-pole only (or) two outer poles of 3-pole breaker.

NOTE: QJ/QR Breakers are single mounted in unit space and take 6" of unit space. Limited to (4) per panel max. BL, HBL, BLH and BQD breakers are mounted in common mountings in 3" or (6) pole increments. ED4, ED6, HED4 and HHED6 breakers are mounted in common mountings in 3" or (6) pole increments.

Main Lugs Only

Maximum Panel Amp Rating	Maximum 1-pole Circuits	Box Height Inches	Catalog Number 3Ø4W 208Y/120V	Catalog Number 1Ø3W 120/240V	Catalog Number 3Ø4W 480Y/277V
125	18	26	P2C18ML125ATS	P2A18ML125ATS	P2E18ML125ATS
	30	32	P2C30ML125ATS	P2A30ML125ATS	P2E30ML125ATS
	42	38	P2C42ML125ATS	P2A42ML125ATS	P2E42ML125ATS
	54	56	P2C54ML125ATS	P2A54ML125ATS	P2E54ML125ATS
	66	62	P2C66ML125ATS	P2A66ML125ATS	P2E66ML125ATS
	78	68	P2C78ML125ATS	P2A78ML125ATS	P2E78ML125ATS
	90	74	P2C90ML125ATS	P2A90ML125ATS	P2E90ML125ATS
250	18	32	P2C18ML250ATS	P2A18ML250ATS	P2E18ML250ATS
	30	38	P2C30ML250ATS	P2A30ML250ATS	P2E30ML250ATS
	42	44	P2C42ML250ATS	P2A42ML250ATS	P2E42ML250ATS
	54	56	P2C54ML250ATS	P2A54ML250ATS	P2E54ML250ATS
	66	62	P2C66ML250ATS	P2A66ML250ATS	P2E66ML250ATS
	78	68	P2C78ML250ATS	P2A78ML250ATS	P2E78ML250ATS
	90	74	P2C90ML250ATS	P2A90ML250ATS	P2E90ML250ATS
400	18	38	P2C18ML400ATS	P2A18ML400ATS	P2E18ML400ATS
	30	44	P2C30ML400ATS	P2A30ML400ATS	P2E30ML400ATS
	42	50	P2C42ML400ATS	P2A42ML400ATS	P2E42ML400ATS
	54	56	P2C54ML400ATS	P2A54ML400ATS	P2E54ML400ATS
	66	62	P2C66ML400ATS	P2A66ML400ATS	P2E66ML400ATS
	78	68	P2C78ML400ATS	P2A78ML400ATS	P2E78ML400ATS
	90	74	P2C90ML400ATS	P2A90ML400ATS	P2E90ML400ATS
600	18	38	P2C18ML600ATS	P2A18ML600ATS	P2E18ML600ATS
	30	44	P2C30ML600ATS	P2A30ML600ATS	P2E30ML600ATS
	42	50	P2C42ML600ATS	P2A42ML600ATS	P2E42ML600ATS
	54	56	P2C54ML600ATS	P2A54ML600ATS	P2E54ML600ATS
	66	62	P2C66ML600ATS	P2A66ML600ATS	P2E66ML600ATS
	78	68	P2C78ML600ATS	P2A78ML600ATS	P2E78ML600ATS
	90	74	P2C90ML600ATS	P2A90ML600ATS	P2E90ML600ATS

Main Circuit Breaker

Maximum Panel Amp Rating	Maximum 1-pole Circuits	Box Height Inches	Catalog Number 3Ø4W 208Y/120V	Catalog Number 1Ø3W 120/240V	Catalog Number 3Ø4W 480Y/277V
100	18	26	P2C18BL100ATS	P2A18BL100ATS	P2E18BL100ATS
	30	32	P2C30BL100ATS	P2A30BL100ATS	P2E30BL100ATS
	42	38	P2C42BL100ATS	P2A42BL100ATS	P2E42BL100ATS
125	18	26	P2C18NB125ATS	P2A18NB125ATS	P2E18NB125ATS
	30	32	P2C30NB125ATS	P2A30NB125ATS	P2E30NB125ATS
	42	38	P2C42NB125ATS	P2A42NB125ATS	P2E42NB125ATS
	54	56	P2C54NB125ATS	P2A54NB125ATS	P2E54NB125ATS
	66	62	P2C66NB125ATS	P2A66NB125ATS	P2E66NB125ATS
	78	68	P2C78NB125ATS	P2A78NB125ATS	P2E78NB125ATS
	90	74	P2C90NB125ATS	P2A90NB125ATS	P2E90NB125ATS
225①	18	32	P2C18QR225ATS	P2A18QR225ATS	P2E18FX225ATS
	30	38	P2C30QR225ATS	P2A30QR225ATS	P2E30FX225ATS
	42	44	P2C42QR225ATS	P2A42QR225ATS	P2E42FX225ATS
	54	56	P2C54QR225ATS	P2A54QR225ATS	P2E54FX225ATS
	66	62	P2C66QR225ATS	P2A66QR225ATS	P2E66FX225ATS
	78	68	P2C78QR225ATS	P2A78QR225ATS	P2E78FX225ATS
	90	74	P2C90QR225ATS	P2A90QR225ATS	P2E90FX225ATS
250	18	38	P2C18FX250ATS	P2A18FX250ATS	P2E18FX250ATS
	30	44	P2C30FX250ATS	P2A30FX250ATS	P2E30FX250ATS
	42	50	P2C42FX250ATS	P2A42FX250ATS	P2E42FX250ATS
	54	62	P2C54FX250ATS	P2A54FX250ATS	P2E54FX250ATS
	66	68	P2C66FX250ATS	P2A66FX250ATS	P2E66FX250ATS
	78	74	P2C78FX250ATS	P2A78FX250ATS	P2E78FX250ATS
400	18	50	P2C18JX400ATS	P2A18JX400ATS	P2E18JX400ATS
	30	56	P2C30JX400ATS	P2A30JX400ATS	P2E30JX400ATS
	42	62	P2C42JX400ATS	P2A42JX400ATS	P2E42JX400ATS
	54	68	P2C54JX400ATS	P2A54JX400ATS	P2E54JX400ATS
	66	74	P2C66JX400ATS	P2A66JX400ATS	P2E66JX400ATS
600	18	56	P2C18LX600ATS	P2A18LX600ATS	P2E18LX600ATS
	30	62	P2C30LX600ATS	P2A30LX600ATS	P2E30LX600ATS
	42	68	P2C42LX600ATS	P2A42LX600ATS	P2E42LX600ATS
	54	74	P2C54LX600ATS	P2A54LX600ATS	P2E54LX600ATS

① QJ series was available prior to QR.

• Revised •
04/15/14

Panelboards

Type P2 Panelboard Modifications and Additions

Selection

Enclosures

Extra Gutter to Sides or Ends of the Can (Type 1 Only)

Description
6" end gutter 2" side gutter Barrier in gutter (add to extra gutter price – min 4" required) 24" wide
Hinged trims Piano hinged trims Door-in-door trims Screw to the box trims
Trim mounted devices . . . . . See page 11-83 • Pilot lights • Toggle switches • Push buttons
Painted boxes . . . . . See page 11-83 Custom colors . . . . . See painted boxes Increase gauge trims and boxes . . . . . See page 11-83 Stainless steel trims and boxes, Type 1 . . . . . See page 11-83

Meters
(Contact sales for pricing and application engineering for space requirements)

Panel Skirts See page 11-84

Special Locks

TEY
TEU1
Cat 60
LL803
LL806
Yale 47 (NYC)
National C413A
Best Lock 7-pin tumbler
Southco 1/4 Fastener
Corbin 1001 FAB7

Panel Bus Modifications

Main Bus	Catalog Number Addition Amperes Ratings			
	125A	250A	400A	600A
750 A/Sl AL.	B	B	B	B
Copper (tin pltd.)	F	F	F	F
Copper (silver pltd.)	E	E	E	E
1000 A/Sl Copper (tin pltd.)	G	G	G	G
1000 A/Sl Copper (silver pltd.)	H	H	H	H

① Accessories on 1" pole breakers (BL, BQD, ED) will take unit space.

Subfeed, Feed-Thru and Split Bus (for 2-pole or 3-pole)

Ampere Rating	Connector Cu/Al Wire Range	Unit Space (inches)

Subfeed (Double) Lugs for Main Lug Panelboards Only

100/125	(2)—#12 AWG-2/0 kcmil	6
225/250	(2)—#6 AWG-350 kcmil (custom)	6
400	(4)—250 kcmil (custom) (2)—600 kcmil	6

Feed-Thru Lugs — Cannot Be Used in Conjunction with TVSS or Subfeed Breakers (200% Neutral not available)

100/125	(1)—#12 AWG-2/0 kcmil	6
225/250	(1)—#6 AWG-350 kcmil	6
400	(2)—250 kcmil (1)—600 kcmil	9
600	(2)—250-500 kcmil	12

Split Bus (1 per interior)
Requires feed thru lugs also to feed sub panel section and for space requirements.

100/125	(1)—#12 AWG-2/0 kcmil	6
225/250	(1)—#6 AWG-350 kcmil	6
400	(2)—250 kcmil (1)—600 kcmil	6
600	(2)—250-500 kcmil	6

Contactor Mains or Submain*
See Page 11-82

- Asco 920 through 225 amps – adds 12" unit space as main, 15" unit space as submain
- External with manufacture supplied enclosure
- Siemens LEN through 30 amps - adds 6" as main; 18" for up to 100A submain and 21" for 200A. 7.75" depth cans for up to 100A and 10" depth cans for 200A.

*Call plant for correct can size.

Branch and Main Breaker Accessories

See breaker section of this catalog.
- Handle blocks
- Handle locks
- Aux. Contacts①
- UVR①

Increase Capacity Neutral up to 200%
(N/A on Feed Thru Lugs & Subfeed Lugs)

Main Bus Amps
125
250
400
600

See page 11-35 for unit space adders and compatibility with other options.
(Devices mounted and wired to the trim should also have hinged trim specified)

Copper MLO Only

Main Bus Amps
125
250
400
600

Bus mounted SPD See Section 10

Service Entrance Label

Type P2 Panelboards are factory labeled suitable for use as service entrance equipment when NEC requirements are met. A panelboard cannot have more than six main disconnects, unless it is a lighting and appliance branch panelboard. Lighting and appliance branch panelboards are limited to two main disconnects.

Grounding of Panelboards

Ground Bars except for brazed to box are shipped with the panel interior factory mounted.
- Non-Insulated Equipment Ground Bar
- Copper Non-Insulated Ground Bar
- Al Insulated Equipment Ground Bar
- Cu Insulated Equipment Ground Bar
- Ground Bar Brazed to Box (Not recommended for painted or NEMA 3R enclosures)

Shunt Trip on Main or Branch

BL, BLH, HBL, xGB, ED4, HED4, HED6, HHED6 uses 1" unit space for shunt trip. All others may be used on mains or subfeeds. See breaker section for list price adders.

Time Clocks

Time clocks may be mounted in a 23" enclosure to be cable connected to the panel. Sangamo, Tork or Paragon time clock can be supplied and mounted in panelboard cabinet. Adds 12" to panel height. Mounts in Sub-area.

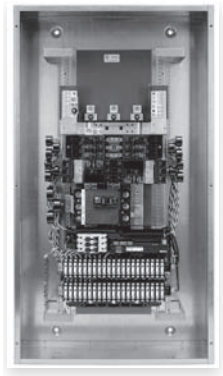
Description
Time Clock (1 or 2-pole, single or double throw contacts; 3-pole, single throw) 277V maximum with plain dial
Astronomical dial
An omitting device
Reserve power or carryover
Space and mounting provisions only

SEM3 System configured in Panelboards

The Siemens SEM3 system can be configured for factory installation in branch circuit monitoring applications using the Siemens COMPAS configuration tool. This option can lower the installation time of the system for the installer while providing a factory warrantied solution.

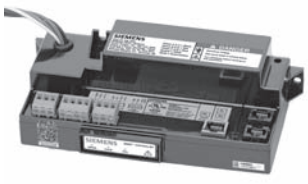
The SEM3 system can be factory installed in unit space in type P2, P4, & P5 Siemens panel boards and SB1, SB2, & SB3 type Siemens switchboards. Please note P1 and P3 configurations are not available at this time and the amount of unit space needed varies depending upon the application. Please note that lead time adders will apply and may vary depending upon the configuration of the system.

SEM3 for use in Siemens Panelboards



Type P2: Enclosure

- Available in a NEMA 1, 3R, or 12 rated enclosure.
- Minimum width & depth: 24" width x 5.75" depth
- Height: Up to 74" depending on branch breaker selection
  - – Addition of monitoring on some mains (primary and subfeed) may require additional box length. In these cases the box will be increased to the next size available as a standard design.
  - – In cases where enclosure size is increased all multi-section panels will be increased to match the largest section.



Controller

SEM3 controller is mounted in unit space opposite of the feed location specified in COMPAS (i.e., bottom mount for top feed) and will require 3" of unit space. Each controller will be powered by direct tap connection to the panel section bus. Each controller can monitor up to 45 circuits. Applications that require monitoring more than 45 circuits will require additional controllers.

Current Transformers (CTs)

Five sizes of CTs are available for use in the P2 panel: 50, 125, 250, 400 & 600 amp. All CTs are pre-mounted to a support bracket that attaches to the base rail of the interior of the panel board. Each bracket supports a maximum of 3 CTs and is designed for the breaker selected (brackets are not interchangeable between breaker frames). Each CT will be attached to a data module that is placed in the meter racks.

Meter Racks

Each meter rack requires 3" of unit space. All meter racks will be installed next to the SEM3 controller in unit space. The COMPAS configuration tool will select the appropriate meter rack configuration according to the user's application and will use the 21 space meter rack as a default option where possible. Only one meter rack (regardless of number of positions) can be installed in 3" of unit space.

NOTE: Monitoring of 45 circuits will require 9" of unit space: two 21 position racks and one 3 position rack

• Revised •
09/19/14

Panelboards

Embedded Micro Metering Module™ (Type P2 Panelboard)

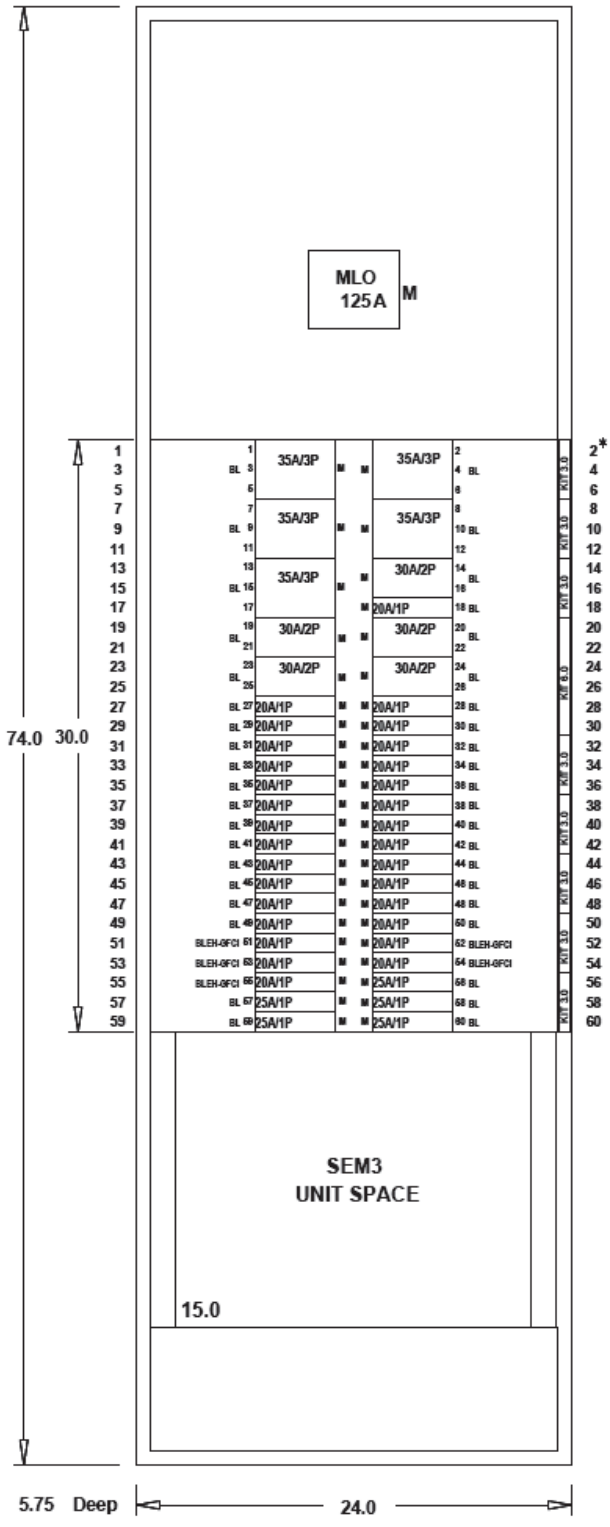
Selection

P2 Devices
Enclosure sizes

Example P2 Panel with SEM3 Type 1 Enclosure (24" Wide x 5.75" Deep)

Enclosure heights are in 6" increments from 26" thru 74".
Enclosure heights: 26", 32", 38", 44", 50", 56", 62", 68", 74"

The COMPAS configuration tool can provide actual dimensions based on the configuration.
Example below is largest standard P2 enclosure for factory assembled panel
with all small (1") branch breakers installed.



24" std. width

Main Breaker / Main Lug space varies based on selected options

Unit space varies
based on selected options

Note: All circuits do not have to be monitored by SEM3 - user can select any circuits in this space to be monitored.

Based on smallest branch breakers and a 3-phase main being monitored.
There is a maximum of 63 circuits that can be monitored with the configuration shown.
Some selections of main breakers and other subfeed options could limit this further.

In this situation there is 30" of unit space available - so 60 branch circuits could be monitored.
If monitoring the main three additional circuits could be monitored with a total of 63 circuits.

This requires two controllers and three 21 position racks using 15" of unit space.
- see below -

SEM3 space varies by number of circuits monitored - this uses unit space.

== > 6" of space for up to 21 circuits monitored
one controller and one 21-pos rack

== > 9" of space for up to 42 circuits monitored
one controller and two 21-pos racks

== > 12" of space for up to 45 circuits monitored
one controller and two 21-pos racks plus one 3-pos rack

== > 15" of space for up to 63 circuits monitored
two controllers and three 21-pos racks

Note: If subfeed space is needed - it will take away from available unit space.

Panelboards

Type P2 Panelboard Standard Modifications and Additions

Selection

Box Size Additions for Optional Features

Options	Main Lugs				Main Breakers											
	125A	250A	400A	600A	125A Horiz. BL, BQD, ED, xGB	125A Horiz. CED	125A Vert. ED	225A Horiz. QJ QR	225A Vert. QJ QR	225A Horiz. FD	250A Vert. FD	250A Vert. CFD	400A JD	400A CJD	600A LD	600A CLD
***Min. Box Size**	**26"**	**32"**	**38"**	**38"**	**26"**	**32"**	**32"**	**32"**	**38"**	**38"**	**44"**	**50"**	**50"**	**62"**	**56"**	**62"**
200% Neutral (lug type)	0	0	6 (all)	6 (all)	0	0	0	N/A	0	N/A	0	0	0	0	0	0
Std. Lugs (100% Neut. PNL)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CU Lugs (100% Neut. PNL)	6	6	6	0	N/A	N/A	0	N/A	0	N/A	0	0	0	0	0	0
Comp Lugs (100% Neut. PNL)	6	6	6	6	N/A	N/A	0	N/A	0	N/A	0	0	0	0	0	0
Feed-thru Standard Lugs	6	6	12	12	6	6	6	N/A	6	N/A	6	6	12	12	12	12
Feed-thru Cu Lugs	6	6	12	N/A	N/A	N/A	6	N/A	6	N/A	6	6	12	12	N/A	N/A
Feed-thru Comp Lugs	6	12	12	N/A	N/A	N/A	6	N/A	6	N/A	12	12	12	12	N/A	N/A
Subfeed Standard Lugs	0	6	6	N/A	—	—	—	—	—	—	—	—	N/A	—	—	—
Split Bus	6	6	6	6	6	6	6	N/A	6	N/A	6	6	6	6	6	6
(1) FD Subfeed (Horizontal Mtg.)	N/A	12	12	12	N/A	N/A	N/A	N/A	N/A	12	12	12	12	12	12	12
(2) FD Subfeed (Vertical Mtg.)	N/A	24	24	24	N/A	N/A	N/A	N/A	N/A	24	24	24	24	N/A	N/A	N/A
SPD	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

Split bus is paired with feed-thru lugs by default. Feed-thru lugs are to feed the section after the split.

NOTE: N/A = OPTION NOT AVAILABLE

*Min. Box Size, corresponding to 9" of Unit Space.

Compression Lugs

Style	Amp Rating	Breaker Type	Compression Connectors	Box Height Addition
MLO	125	N/A	(1)#6 - 350 kcmil Al/Cu	6
	250	N/A	(1)#6 - 350 kcmil Al/Cu	6
	400	N/A	(1) 400 - 600 kcmil Cu or (2)#6 - 350 kcmil Al/Cu	6
	600	N/A	(2)#6 - 350 kcmil Cu or Cu/Al or 400 - 600 kcmil Al/Cu	6
Main Breaker	100	ED4, ED6, HED4 HHED6, CED6①	(1)#14-2/0 AWG Cu or Al	Box must go to 24" wide on CED6 breaker only Add 6" to box height for NØ
	225	QJ2, QJH2, QJ2H QR2, QRH2, HQR2, HQR2H	(1)#6 AWG - 350 kcmil Cu or Al	Box must go to 24" wide
	250	FXD6, HFD6, CFD6	(1)#6 AWG - 350 kcmil Cu or Al	Box must go to 24" wide for all breakers Requires an additional 6.0" box height
	400	JD6, JXD6, HJD6, CJD6, SJD6, SHJD6, SCJD6	(2)#1/0 AWG - 500 kcmil Cu or Al	9
	600	LD6, LXD6, HLD6, CJD6, SLD6, SHLD6, SCLD6	(2)#2/0 AWG - 500 kcmil Cu or Al	6

Alternate Lugs

Style	Amp Rating	Breaker Type	Standard AL Connectors	Box Height Addition
MLO	400	N/A	(1) 250 - 750 kcmil or (2)#3/0 AWG - 250 kcmil Cu or Al	6
Main Breaker	400	JD6, JXD6, HJD6, CJD6, SJD6, SHJD6, SCJD6	(1)#4/0 AWG - 750 kcmil Cu or Al	6

① Not availabe for feed thru lug.

Enclosure Modifications

Description
20" Panel Width
NEMA 3R enclosures
NEMA 3R/12 enclosures
Gasket between trim and box (Type 1)
24" Panel Width
NEMA 3R enclosures
NEMA 3R/12 enclosures
Gasket between trim and box (Type 1)

NEMA-4—Water Tight, Dust Tight, Steel Enclosure (Actual NEMA-4 enclosure is larger than standard Type 1 enclosure. See chart below for reference to approximate actual size.)

Standard Box Height (in inches)	Actual NEMA 4 Enclosure Size		
	H	W	D
32	32	20	8
38	42	30	8
44	48	36	8
56	60	36	10

NOTE: Larger NEMA 4 enclosures are not available.

NEMA-4X—Water Tight, Dust Tight and Corrosion Resistant (consult plant for actual enclosure size)

Catalog Number	Enclosure – Stainless Steel Size (inches) (304SS is standard)			Enclosure – Fiberglass Size (inches)		
	H	W	D	H	D	W
B4X26	26	20	5.75	36	30	8
B4X32	32	20	5.75	36	30	8
B4X38	38	20	5.75	48	36	12
B4X44	44	20	5.75	48	36	12
B4X50	50	20	5.75	60	36	12
B4X56	56	20	5.75	60	36	12
B4X62	62	20	5.75			
B4X68	68	20	5.75			
B4X74	74	20	5.75			

NOTE: 316SS is available as an option - must be specified.

Panelboards

Type P2 Panelboard Kits and Accessories

Selection

Standard Enclosures

Box Height Inches	Catalog Number				
	Type 1 Standard Trim				
	Box	Surface	Flush	Type 3R	Type 3R/12
26	B26	S26B	F26B	NR26	WP26
32	B32	S32B	F32B	NR32	WP32
38	B38	S38B	F38B	NR38	WP38
44	B44	S44B	F44B	NR44	WP44
50	B50	S50B	F50B	NR50	WP50
56	B56	S56B	F56B	NR56	WP56
62	B62	S62B	F62B	NR62	WP62
68	B68	S68B	F68B	NR68	WP68
74	B74	S74B	F74B	NR74	WP74

Options For Type 1 Trims
Items must be ordered as manual line item on Spartanburg
Hinged trim – Replace "B" suffix with "H"
Door-in-door – Replace "B" suffix with "D"
Screw to Box - Replace "B" suffix with "C"
Metal card holder - Add "M" suffix on all trims

Option For 24" Wide Enclosures with Equal Gutter on Both Sides (Excludes NEMA 3R)
24" wide with equal gutter on both sides - Add "24" as prefix

Breaker Kits and Accessories

Kit Number	Description	Contents
BBKB32 (P2/P3)	BL/BQD 6-pole 3" branch breaker kit	Kit contains top barrier, (3) A/C connectors, (1) B connector, hardware
BBKED32 (P2/P3)	ED 6-pole 3" branch breaker kit	Kit contains breaker support, inter-phase barriers, (3) A/C connectors, (1) B connector, hardware
BBKNB32 (P2/P3)	xGB 6-pole 3" branch breaker kit	Kit contains top barrier, (3) A/C connectors, (1) B connector, hardware
BBKQ1 (P2)	QJ/QR branch breaker kit for 2 and 3-pole single mount	Kit to contain all connectors and cover plates necessary to mount both 2 and 3-pole breakers
BBKQR1 ①	P2 branch BKR strap kit for single QR 1-phase/3-phase.	
BBKQR2 ①	P3 twin BKR mounting kit for 1-phase/3-phase.	
DFK1	BL, BQD, ED deadfront kit for 1" pole breakers	Center strips 3", 6", 9", 15", 21" plus mounting hardware
DFFP3	Deadfront filler 3"	3" empty space filler and hardware
DFFP6	Deadfront filler 6"	6" empty space filler and hardware
BNK2	Branch neutral (P2)	Three tier lug with mounting hardware to increase neutral capacity
P2BK1	P2 250A max. Bonding Kit	Bonding strap and hardware
P2BK2	P2 400A max. Bonding Kit	Bonding strap and hardware
P2BK3	P2 600A max. Bonding Kit	Bonding strap and hardware
BBKQRP1FK	P2 Filler for QR. Horizontal or vertical mount. 1-phase/3-phase.	Kit contains all cover plates necessary to change from QJ to QR both 2 and 3-pole breakers.
BBKQRP2FK	P3 Filler for QR. Dual mount horizontal. 1-phase/3-phase.	Kit contains all cover plates necessary to change from QJ to QR both 2 and 3-pole breakers. For 1-phase panel, both breakers must change from QJ to QR, cannot have one of each installed.

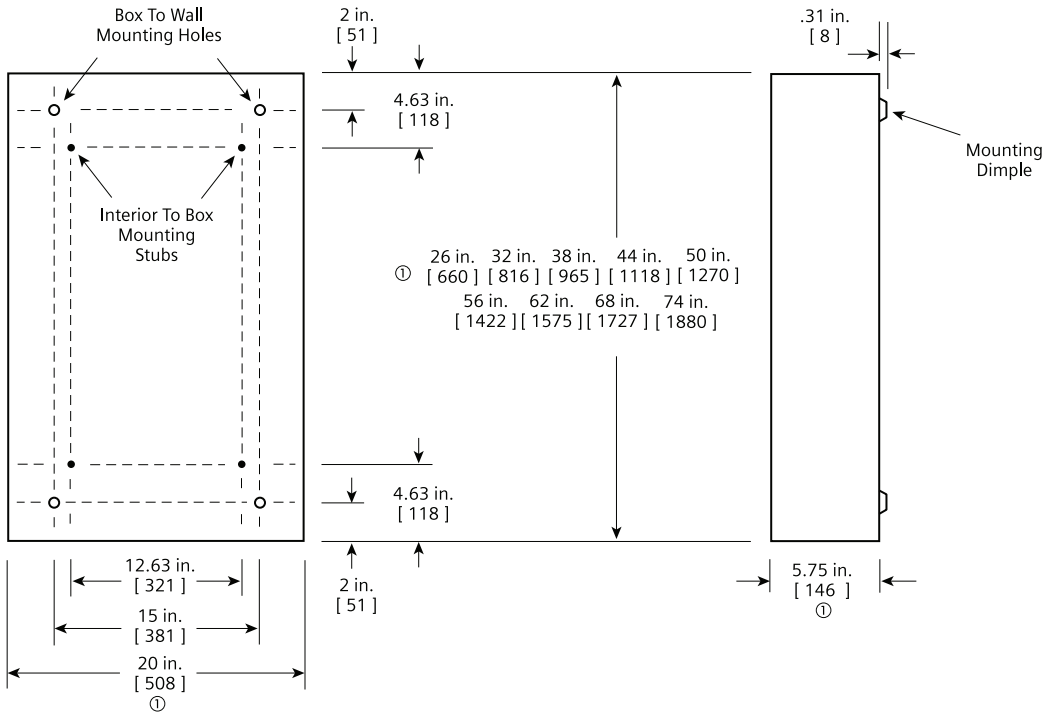
① Although QR is rated 250A, it is limited to 225A in panelboard.

Type P1, P2, and P3 Panelboards

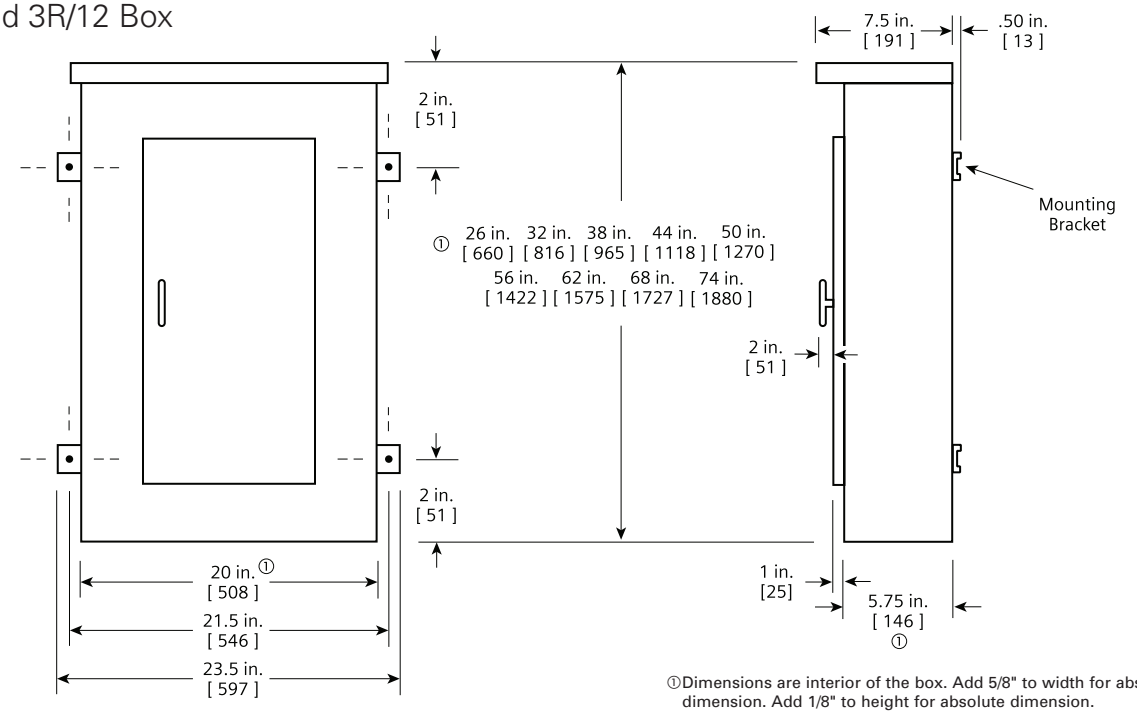
Miscellaneous Parts and Accessories

Catalog Number	Description	Catalog Number	Description
EGK	Al Ground Bus 44 Connections	**NBK6**	Number Strips 86-168 (snap-in type, P2/P3 panels)
P2BK1	P2 250A Bonding Kit	**NBK7**	Number Strips 169-210 (snap-in type, P2/P3 panels)
P2BK2	P2 400A Bonding Kit	**NBK8**	Number Strips 211-252 (snap-in type, P2/P3 panels)
P2BK3	P2 600A Bonding Kit	**ECGK**	Cu Ground Bus 44 Connections
IMK1	Interior Adjusting Kit	**IGK**	Insulated Al Ground Bus
11-1824-01	Directory Card Holder	**ICGK**	Insulated Cu Ground Bus
12-1110-01	Directory Card	**EWK1**	End Wall Kit with Knockouts (20" W x 5.75" DP)
11-1056-01	NEMA Instruction Book	**EWK2**	End Wall Kit with Knockouts (24" W x 7.75" DP)
NBK3	Number Strips 1-42 (snap-in type, P2/P3 panels)	**DFFP1**	1" Filler Plate – (suitable for replacing QF3 in P1 thru P5 Panelboards and Switchboards)
NBK4	Number Strips 43-84	**EBF1**	NEB/HEB Filler Plate
NBK5	Number Strips 85-126		

Type 1 Box
Box is symmetrical



Type 3R and 3R/12 Box



①Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.
Dimensions shown in inches and millimeters [ ].