

Introduction

This new generation of products from Siemens offers the high level of engineering and innovation you've come to expect from the leader in power distribution technology. The "P Series" line of panelboards offers a stepped approach to power distribution.

Additional strength has been added to an already rugged and durable panelboard family. Engineered specifically to provide maximum flexibility, the new designs simplify wiring and reduce material requirements making them easier to install and less costly than competitive products. At the heart of the product line is the extensive research and technology found among Siemens circuit protection devices – both fusible switches and molded case circuit breakers.

The line is anchored by the innovative P1. Featuring the industry's most flexible designs, the P1 virtually eliminates common errors, such as feed direction, and main lug versus main breaker. Increasing distribution is simplified by the ability to add feed-thru lugs. Because of its unique design, the P1 meets the majority of lighting panel needs with only six standard sizes.

Subsequent steps in the P Series offer increased capacity and more design options:

- The highly flexible P2 provides options to fit the most demanding specifications.

- Sized more like a lighting panel, the P3 packs the power of a distribution panel in a space-saving, highly flexible design.
- The P4 is a mid-sized distribution panel that allows both fusible and circuit breaker branch and main devices.
- The powerful P5 anchors the high end of the series. With larger fusible and circuit breaker branch and main devices, the venerable P5 delivers maximum power and flexibility to larger distribution systems.

Siemens also offers a number of specialty panels, like column panels. Don't see a panel to meet your requirements? Ask your Siemens representative about our custom capabilities.

Features Overview

P Series lighting panel features include Fas-Latch trim, which is popular among installers; the jacking screw system, that permits adjustments even after wiring has been installed; our exclusive split neutral, and more. Many panelboards have the capability of mixing and matching breakers of different sizes and ratings – or changing from main lug to main breaker, or adding subfeed breakers without changing the box size. Other models accept a wide range of fuse types, including Siemens exclusive Vacu-Break® technology.

Table G1 – Key Panelboard Features

	P1	P2	P3	P4	P5
Lighting And Appliance Applications (Pre 2008 NEC)	•	•	•	•	•
Power Panelboard Applications	—	•	•	•	•
Convertible From Top Feed To Bottom Feed Or Vice Versa	•	—	—	—	—
Change From Main Lug To Main Breaker Or Add Subfeed Without Changing Enclosure Size	•	—	—	—	—
Space-Saving, Horizontally Mounted Main Breaker	Up To 250 Amps	Up To 250 Amps	Up To 250 Amps	•	•
Short-Circuit Rating Label Giving Performance Level	•	•	•	•	•
Standard Aluminum Ground Assembly	•	•	•	•	•
Blank End-Walls Standard ¹	•	•	•	•	•
Bolted Current-Carrying Parts	•	•	•	•	•
Split Neutral	•	•	•	•	•
Connection Accessible From Front	•	•	•	•	•
Screw-Type Mechanical Lugs	•	•	•	•	•
Time-Reducing Wing Nuts To Secure Interior Without Tools	•	•	•	•	•
Main and Branch Devices Connected With Case-Hardened Hardware	•	•	•	•	•
Flush Lock, Concealed Door Hinges/Trim Screws	•	•	•	—	—
Symmetrical Interior Mounting Studs To Eliminate Upside-Down Mounting of Box	•	•	•	•	•
Interior Height Adjustment For Flush Applications	•	•	•	•	•
Mix and Match Fusible Switch Circuit Breaker Capability	—	—	—	•	•
Shallow Depth	5.75"	5.75"	7.75"	10.00"	12.75"
Accepts A Wide Range Of Fuse Types	—	—	—	•	•
Accepts Vacu-Break Fusible Switch	—	—	—	•	•
Accepts A Wide Range Of Circuit Breakers	—	•	•	•	•
Accepts ACCESS™ Communications Tie-In ²	—	•	•	•	•
Optional Compression Lugs	•	•	•	•	•

• Standard

¹ KO's available on P1 and P2 – 5.75" Deep x 20" Wide boxes and P3 7.75" deep X 24" wide boxes.

² Panelboards equipped with Siemens Sensitrip® circuit breakers or Power Meters can be integrated into Siemens ACCESS™ electrical monitoring system.

General Specifications

Class CTL Panelboards (when applicable)

Class CTL panelboards incorporate physical features which, in conjunction with the physical size, configuration, or other means provided in Class CTL circuit breakers, are designed to prevent the installation of more over current protective poles than the number for which the device is designed and rated, per UL 67 and National Electrical Code (NEC) NFPA70.

Service Entrance Equipment

When a panelboard is used as service entrance equipment, it must be located near the point of entrance of building supply conductors. In a main lugs only panel, the number of breakers or switches directly connected to the main bus must be limited to six. In a panel having a main breaker or main switch, the number of circuits are not limited except as may be provided under other panelboard requirements, i.e., lighting and appliance branch circuit panelboards. Also, panels must include a connector for bonding and grounding neutral conductor.

Panelboard Code Data (where applicable)

42-Circuit Rule: NEC Paragraph 408.14 defines a lighting and appliance branch circuit panelboard as one having more than 10 percent of its over current devices rated 30 amperes or less, for which neutral connectors are provided. NEC paragraph 480.35 states that not more than 42 over current devices (other than those provided in the mains) of a lighting and appliance branch-circuit panelboard shall be installed in any one cabinet. For the purpose of this publication, a two-pole circuit breaker shall be considered two over current devices; a three-pole circuit breaker shall be considered three over current devices. (NEC 480.34 and .35 do not apply to panelboards feeding and communication circuits. Panelboards for this application must be so marked.)

Integrated Equipment Short Circuit Rating

The term "Integrated Equipment Short Circuit Rating" refers to the application of series connected circuit breakers in a combination that allows some breakers to have lower individual interrupting ratings than the available fault current. This is permitted as long as the series combination has been tested and certified by UL.

Standards

NEC: 2008 (where accepted)

NEMA: PB1

UL: 67 and 50. Listed by Underwriter's Laboratories, Inc., under "Panelboards" File #E2269, and #E4016. Meets Federal Specification W-P-115c.

Wire Connectors

Standard wire connectors in Siemens panels are suitable for copper or aluminum cables rated 60/75 degree. Copper main lugs are a price-added option for most panel types and some Circuit Breakers (check with Siemens sales for availability). It should be noted that most copper lugs will only accept copper cables. Some applications, 100% rated devices in particular,

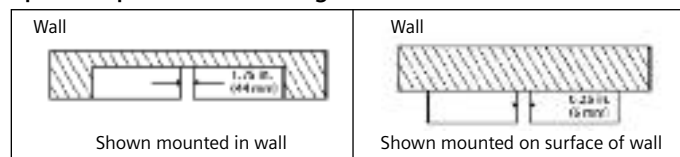
require that the cable and connectors be rated 90 degree but are sized to the 75 degree tables.

Standard ground connectors are also suitable for copper or aluminum wire. Ground connector assemblies (EGK, IKG) have (7) 1/0 max. and (15) #6 max. connections. The 1/0 holes are capable of connecting up (3) #10 max. wires. Copper ground assemblies (ECGK, ICGK) are rated for copper wire only and have the same wiring capacity as the Al/Cu connectors.

Standard neutrals, like standard main lugs, are also rated for copper or aluminum wire. The neutral cross bar material follows the selection bus. Copper neutral lugs are rated for copper cable only and available as a price added option.

Lug Data

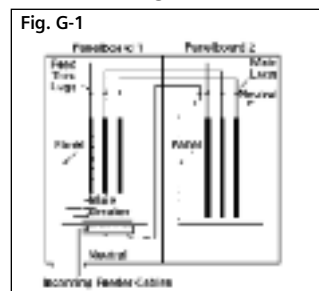
Space Required for Mounting of Double Panels



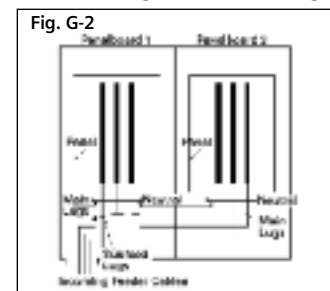
Use two or more panelboards with feed-thru or subfeed lugs when:

1. Lighting and appliance panelboards are required with more than 42 circuits in areas where the zone code has not been accepted.
2. More circuit mounting space is required than is provided in the largest box size.

Feed-Thru Lugs



Subfeed Lugs or Double Lugs



Feed-thru lugs are mounted at the opposite end of the main bus from the main lugs or main breaker and are used to connect two or more panelboards to the incoming feeder. The feeder cables are brought into Panelboard 1 and connected to the main lugs or main breaker. Cables interconnecting the two panelboards are connected to the feed-thru lugs in Panelboard 1 and are carried over the main lugs in Panelboard 2. This arrangement could be reversed with the main lugs located at the top and the feed-thru lugs at the bottom of the panel. Subfeed lugs are mounted directly beside the main incoming lugs and are used to connect two or more panelboards to the incoming feeder. The feeder cables are brought into Panelboard 1 and connected to the main lugs. Another set of cables that are the same size are connected to the subfeed lugs of Panelboard 1 and are carried over the main lugs of Panelboard 2.

General Specifications

Bussing Sequence

Interiors are designed to accommodate top or bottom feed. Regardless of which is specified, the uppermost pole is always on "A" phase; the second pole down is always on "B" phase, and the third pole down is always on "C" phase (assuming 3Ø panel).

As standard, branch breakers shall be mounted at the top of the panel with "spaces" at the bottom, regardless of the direction panel is fed.

All breakers have bolted connections except plug-in type. The panel design provides bracing up to 200,000A IR UL short circuit rating. Case-hardened, high performance, thread rolling screws are used on branch bus.

Table G2 – Panelboard Ratings

Description	P1	P2	P3	P4	P5
Max. Voltage	480Y/277V AC Max. 250V DC Max	600V AC Max. 500V DC Max.	600V AC Max. 500V DC Max.	600V AC Max. 500V DC Max.	600V AC Max. 500V DC Max.
System	1-Phase, 2-wire 1-Phase, 3-wire 3-Phase, 3-wire 3-Phase, 4-wire	1-Phase, 2-wire 1-Phase, 3-wire 3-Phase, 3-wire 3-Phase, 4-wire	1-Phase, 2-wire 1-Phase, 3-wire 3-Phase, 4-wire 3-Phase, 3-wire	1-Phase, 3-wire 3-Phase, 4-wire 3-Phase, 3-wire	1-Phase, 3-wire 3-Phase, 4-wire 3-Phase, 3-wire
Mains Main Lugs Main Breaker Main Switch	125A-400A 100A-400A —	125A-600A 100A-600A —	250A-800A 225A-600A —	400A-1200A 400A-800A —	800A-1200A 800A-1200A 200A-1200A
Circuits	18, 30, 42	18, 30, 42, 54, 66 78, 90 ¹	—	—	—
Branch Ratings	15-125A ²	15-400A	15-400A	15-800A C/B 30-200A Fusible	15-1200A C/B 30-1200 Fusible
Branch Disconnect Devices	BL, BLH, HBL, BQD, BQD6, BLE, BLEH, BLF, BLHF, BAF, BAFH, BGL, NGB	BL, BLH, HBL, BQD, BQD6, QJ2 ⁵ , HQJ2 ⁵ , QJ2H ⁵ , HQJ2H ⁵ , ED2, ED4, HED4, ED6, HHED6, BLE, BLEH, BLF, BLHF, BAF, BAFH, BGL, NGB	BL, BLH, HBL, BQD, BQD6, QJ2 ⁶ , HQJ2 ⁶ , QJ2H ⁶ , HQJ2H ⁶ , ED2, ED4, HED4, ED6, BLHF, BAF, BAFH, BGL, NGB, NEB, HEB	All 15-600A Breakers and VL MG at 800A, HHED6, BLE, BLEH, BLF, Fusible Switches 30-200A	All 15-1200A C/B 30A-600A VB Switches 400-1200A HCP
Subfeed Circuit Breakers	ED2, ED4, ED6, HED4, HHED6, QJ2, QJH2, QJ2-H, FXD6, FD6, HFD6, HFXD6 ³	JD6, JXD6, HJD6, HJXD6, FD6, HFD6, FXD6, HFXD6 ^{2 3}	JD6, JXD6, HJD6, FD6, HFD6, FXD6, HFXD6 ^{2 3}	—	—
Enclosure Heights Inches – (mm)	32, 38, 44 @250 A (813, 965, 1118) 56, 62, 68 @400 A (1422, 1575, 1727)	26, 32, 38, 44, 50, 56, 62, 68, 74 (660-1880)	56, 62, 68, 74, 80 (1422-2032)	60, 75, 90 (1524, 1905, 2286)	60, 75, 90 (1524, 1905, 2286)
Standard Trims	Fas-Latch – 1 Piece Surface or Flush	Fas-Latch – 1 Piece Surface or Flush	Fas-Latch – 1 Piece Surface or Flush	Four Piece ⁴ Surface or Flush	Four Piece ⁴ Surface or Flush

¹ Functional pricing is based on circuits shown. However, the panel can be figured with less circuits.

² P1 can have 1 subfeed breaker. P2 and P3 can have up to (2) FD subfeed breakers.

³ JD and FD breakers are mounted vertical. Limitations apply.

⁴ Trim ring provided for flush applications.

⁵ A maximum of (4) QJ breakers may be mounted in a P2 Panel and are single mounted.

⁶ A maximum of (6) QJ breakers may be mounted in a P3 panel and are twin mounted.

General Specifications

Table G3 – Typical Panelboard Modifications

Description	Lighting and Distribution Panelboards			Distribution Panelboards	
	P1	P2	P3	P4	P5
Box					
Type 3R/12	•	•	•	•	•
Type 4, 4X	•	•	•	•	•
Drip Proof	•	•	•	•	•
Drip Proof Hood Only	•	•	•	•	•
Sealed Box	•	•	•	•	•
Gasketed Trim	•	•	•	•	•
Wider Box	•	•	•	•	•
Deeper Box	—	•	•	•	•
Front					
Hinged Front	•	•	•	•	•
Door-in-Door Front	•	•	•	•	•
Common Front	•	•	•	—	—
Split Door	•	•	•	—	—
Special Locks	•	•	•	•	•
Nameplate	•	•	•	•	•
Interior					
Aluminum Equipment Ground Bar	Standard	Standard	Standard	Standard	Standard
Copper Equipment Ground Bar	•	•	•	•	•
Insulated Equipment Ground	•	•	•	•	•
Subfeed Lugs	—	•	•	•	•
Feed-Thru Lugs	•	•	•	•	•
Split Bus	—	•	•	•	•
Compression Lugs	•	•	•	•	•
Copper Lugs	•	•	•	•	•
200% Neutral	•	•	•	400 - 600A	400 - 600A
Temperature Rated - Aluminum ¹	Standard	Standard	Standard	Standard	Standard
Temp. Rise Over Ambient - Copper ¹	•	•	•	•	•
750 Ampere / in. - Aluminum	—	•	•	•	•
1000 Ampere / in. - Copper	—	•	•	•	•
Copper Plating	Tin	Tin Std./ Silver Optional	Tin Std./ Silver Optional	Silver	Silver
Remote Control Switches	External Mounted	•	•	•	•
Time Clocks	External Mounted	•	•	•	•
Circuit Breaker Shunt Trips	•	•	•	•	•
R, J and T Fuse Clips	—	—	—	•	•

All aluminum bus is tin-plated. • Available as an option.

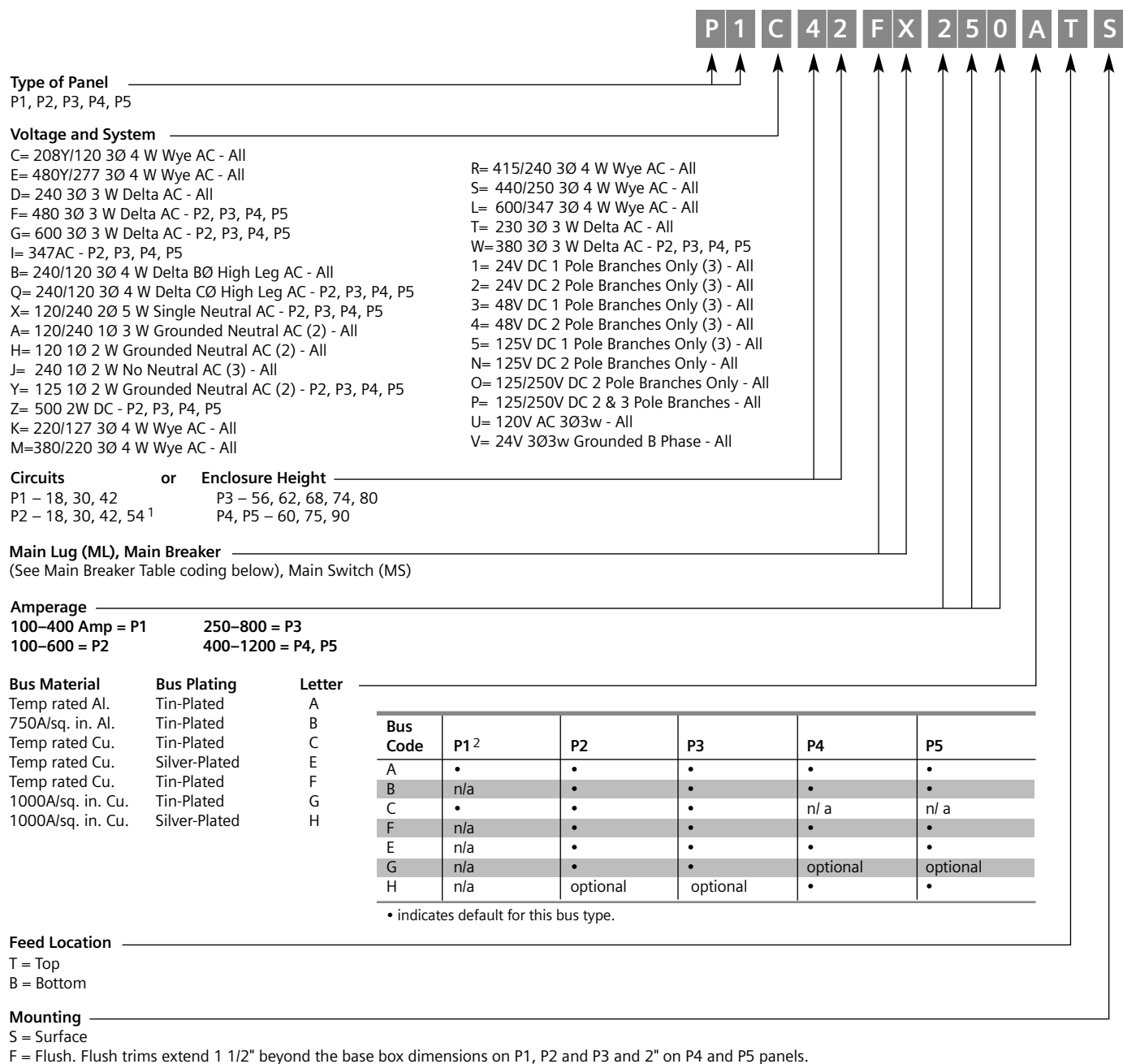
Table G4 – UL Fuse Classes

Class	Amperes	Volts	Interrupting Ratings (kA)	I^2t, I_i	Circuits
H	1-600	250 and 600V or less AC	10	—	Less than 10,000A Available
K5 ²	1-600	250 and 600V or less AC	100	I_t – RK5 up to 100A, I_i – RK5 up to 100A	Feeder circuits
J	1-600	600V or less	200	I_t – Low, I_i – Low	Feeder circuits (motor load small %)
RK1	1/10 - 600	600V or less and 250V or less	200	I_t – Slightly >J, I_i – Slightly > J	Feeder circuits (motor load small %)
RK5	1/10 - 600	600V or less and 250V or less	200	I_t – > RK-1, I_i – > RK-1	Motor starting currents a factor
T	1 - 800, 1 - 1200	300 and 600V or less AC	To 200	I_t – Low, I_i – Low	Non-Motor loads
L	601 - 1200	600V or less	200	I_t – Low, I_i – Low	Mains, feeder circuits

¹ Per UL 67.

² Fuses do not prohibit the use of Class H type fuse in switch.

Catalog Numbering System



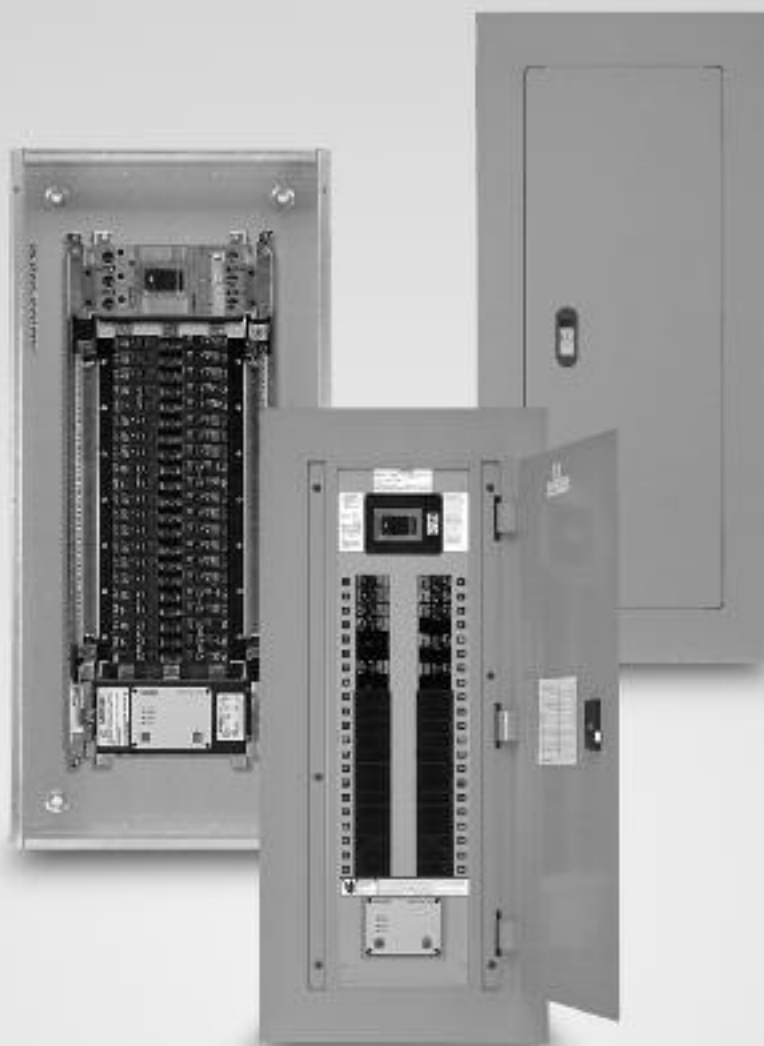
Main Breaker Code

(Breaker Type) Code

(BAF) BA, (BAFH) BF, (BQD) BQ, (BQD6) B6, (BL) BL, (BLEH) BE, (BLH) BH, (BLR) BR, (HBL) HB, (BGL-SWI) B1, (BLE-GFCI) BG, (BLF-GFCI) BC, (CED6) CE, (ED2) ED, (ED4) E4, (ED6) E6, (HED4) H4, (HHED6) HA, (BLHF-GFCI) B4, (BL-HID) B2, (NGB) NB, (HQP) HQ, (QP) QP, (QPH) PQ, (CEG) C4, (QJ2) QJ, (QJ2H) Q2, (QJH2) QH, HQJ2H (Q3), (CFD6) CF, (FD6) FD, (FXD6) FX, (HFD6) HF, (HFXD6) H2, (HHFD6) H1, (HHFXD6) H3, (CJD6) CJ, (HHJD6) H4, (HHJXD6) H9, (HJD6) H6, (HJXD6) H5, (HJXD6H) H7, (JD6) J6, (JXD2) JD, (JXD2H) J2, (JXD6) JX, (JXD6H) JH, (NJX) J1, (HJX) J7, (LJX) J3, (NJY) J4, (SJD6H) SH, (SJD6) SJ, (SHJD6) SX, (SHJD6H) SY, (SCJD6) SC, (HJY) J5, (LJY) J8, (CLD6) CL (HHL6) HH, (HHLXD6) XH, (HLD6) HL, (HLXD6) HO, (HLXD6H) HP, (LD6) L6, (LXD6) LX, (LXD6H) LH, (NLX) L7, (HLX) L2, (LLX) L3, (SLD6) SL, (SHLD6) S2, (SCLD6) S1, (HLM6) HJ, (HLMXD6) HK, (LMD6) L1, (LMXD6) LM, (CMD CM, (CMD6H) CH, (HMD6) HM, (HMXD6) HR, (HMXD6H) HS, (MD6) MD, (MXD6) MX, (MXD6H) MH, (NMX) M1, (HMX) M2, (LMX) M3, SCMD6 (SO), SCMD6H (SQ), SMD6 (SM), SMD6H (AX), SHMD6 (S5), SHMD6H (S6) (CND6) CN, (CND6H) C6, (HND6) HN, (HNXD6) HT, (HNXD6H) HX, (ND6) ND, (NXD6) NX, (NXD6H) NT, (NNX) N1, (HNX) N2, (LNX) N3, (NNY) N4, (HNY) N5, (LNY) N6, SCND6 (SR), SCND6H (ST), SND6 (SN), SHND6 (AD), SND6H (AY), SHND6H (AE)

¹ Panel must not be a lighting and appliance panel. See NEC article 408.34.

² Standard bussing in P1 panels is tin-plated for aluminum and copper.
Standard bus is temperature rated to the maximum amperage.



P1 Panelboards

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Type P1 Panelboards

P1 panelboards are pre-engineered to accept the most common modifications without increasing box height. The enclosure size is determined by the number of circuits as shown in the Main Lug Table P1-5 or the Main Circuit Breaker Table P1-3. All P1 main lug or main breaker panelboards have space built-in to accept either feed-thru lugs equal to the panel rating, one subfeed circuit breaker up to 250 amperes or a surge suppressor (TVSS) without increasing box height.

Note the following features, all found in the innovative P1 lighting panelboards:

- Symmetrical Interiors - No top or bottom! To change from top to bottom (or vice-versa), simply invert the interior. The deadfront labeling is always right-side up.
- First in the Industry Ratings of 125 through 400A main lug and main breaker. Field convertible from main lug to main breaker and vice versa – with no increase in enclosure height.
- Field adaptability of feed-thru lugs or subfeed circuit breaker without increasing enclosure size.
- Neutral system is field upgradeable to 200% capacity – another industry first.
- Three circuit sizes means only three box heights, regardless of main configuration through 250 amp and an additional three circuit version and boxes available at 400 amps.
- Suitable for use as service entrance given compliance with NEC.
- Bonding provisions are shipped with each panel.
- 240V and 480Y / 277V for versions utilize identical boxes and fronts.

Enclosure – Standard Type 1 enclosure is 20" wide x 5.75" deep. Box Height is determined only by the number of circuits, not by main lug or main circuit breaker. See chart P1-5 for box height.

Selection and Application

3 Easy Steps for Selecting a Siemens P1 Panelboard

Step 1

Determine voltage, system, amperage and interrupting rating of branch devices, and modifications if any.

Example for standard lighting panelboard:

Amperage	250A
Voltage	208Y/120V
System	3Ø4W
Main	Main Lug
Branches	10K AIR, 42-20/1
Modifications	None
Feed Location	Top
Mounting	Surface

Step 2

Create a catalog number by following the Panelboard Catalog Numbering System on page 6. The BL branch breakers were selected from the branch breaker selection table on page 1-4.

1-P1C42ML250ATS
42-20/1 BL

Step 3

Select enclosure size by the number of circuits as shown in the panelboard dimensional chart on page 1-6.

1-P1C42ML250ATS
42-20 BL
Box size – 44" high

A unique feature of P1 panels is that they can accommodate either feed-thru lugs or one subfeed circuit breaker (up to 250A) without any addition to box height. For our example changing the branch circuits to 39-20/1 and 1-125/3, we have the following:

1-P1C42ML250ATS
39-20/1 BL
1-125/3 QJ2
Box size – 44" high

The QJ2 subfeed was selected from the table of subfeed breakers on page 1-5. The box height remains the same.

Voltage – 480Y/277 Vac max.
250 Vdc max.

Amperage – 400 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 P1 panel is limited to 22 KAIC. Note that the main device may be mounted remote from the panel.

Bussing – The P1 panel meets the majority of the markets bussing 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 P1 panel is temperature rated 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

Table P1-1 – Box Material Gauge

Width	Height (inches)	Gauge Steel
20"	32, 38, 44	#16
	56, 62, 68	

Table P1-2 – Trim Material Gauge

20"	32, 38, 44	#14
	56, 62, 68	

Application

Type P1 Panelboards

Table P1-3 – Main Breaker Panel Size Selector

Maximum Ampere Rating	Main Breaker Types	Max. No. of Poles	Dimensions in Inches (mm)		
			Unit Space A	Box Height B	Weight In lbs. (kg)
100	BL, BLH	18 30 42	9 (229)	32 (813)	105 (48)
	HBL		15 (381)	38 (965)	120 (55)
	BQD		21 (533)	44 (1118)	135 (61)
125	NGB		9 (229)	32 (813)	110 (50)
			15 (381)	38 (965)	125 (57)
			21 (533)	44 (1118)	140 (64)
	ED2, ED4, ED6, HED4, HED6		9 (229)	32 (813)	110 (50)
			15 (381)	38 (965)	125 (57)
			21 (533)	44 (1118)	140 (64)
225	QJ2		9 (229)	32 (813)	110 (50)
	QJH2		15 (381)	38 (365)	125 (57)
	QJ2-H		21 (533)	44 (1118)	140 (64)
250	FXD6		9 (229)	32 (813)	115 (52)
	FD6		15 (381)	38 (965)	130 (59)
	HFD6, HFXD6		21 (533)	44 (1118)	145 (66)
≤ 250	MLO		9 (229)	32 (813)	115 (52)
			15 (381)	38 (365)	125 (57)
			21 (533)	44 (1118)	135 (61)
400	JD6, JXD6	18 30 42	9 (229)	56 (1422)	172 (78)
	HJD6		15 (381)	62 (1575)	190 (86)
	HJXD6		21 (533)	68 (1727)	208 (95)
	MLO		9 (229)	56 (1422)	115 (52)
			15 (381)	62 (1575)	130 (59)
			21 (533)	68 (1722)	145 (66)

Note: Main breakers use breaker connectors. For sizes, see breaker connector chart. 400 amp main breaker panel has wire bending space for 600 kcmil cables as standard. Use 750 Kcmil lug if 600 Kcmil cable is to be used.

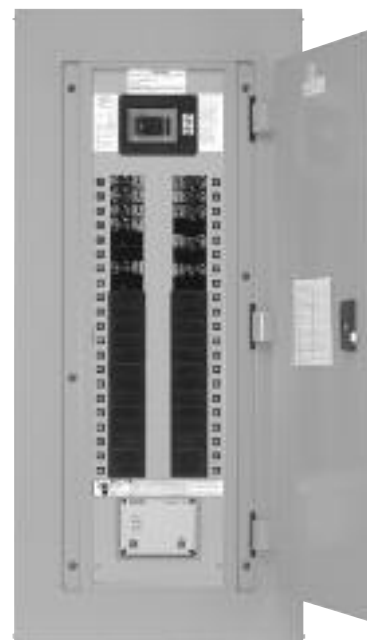


Table P1-4 – Main Breaker Selection

Ampere Rating	Breaker Type	Max. IR (kA) at		Additional Trip Values
		240V AC	480/277V AC	
100	BL (STD)	10	—	15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
	BLH	22	—	15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
	HBL	65	—	15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
	BQD	65	14	15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100
125	NGB (STD)	100	25	50, 60, 70, 80, 90, 100, 110, 125
	ED4 (STD)	65	25	50, 60, 70, 80, 90, 100, 110, 125
	HED4	100	42	50, 60, 70, 80, 90, 100, 110, 125
225	QJ2 (STD)	10	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	QJH2	22	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	QJ2-H	42	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
	HQJ2H	100	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
250	FXD6 (STD)	65	35	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250
	FD6	65	35	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250
	HFD6	100	65	70, 80, 90, 100, 150, 175, 200, 225, 250
	HFXD6	100	65	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250
400	JXD6 (STD)	65	35	200, 225, 250, 300, 350, 400
	JD6	65	35	200, 225, 250, 300, 350, 400
	HJD6	100	65	200, 225, 250, 300, 350, 400
	HJXD6	100	65	200, 225, 250, 300, 350, 400

Application

Type P1 Panelboards

Table P1-5 – Main Lugs Size Selector

Maximum Ampere Rating	Maximum Number of Poles	Dimensions in Inches (mm)		Weight In lbs. (kg)	Connectors Suitable for
		Unit Space A	Height B		
125	18	9 (229)	32 (813)	100 (45)	(1) #6 AWG - 350 kcmil
	30	15 (381)	38 (965)	115 (52)	
	42	21 (533)	44 (1118)	135 (61)	
250	18	9 (229)	32 (813)	100 (45)	(1) #6 AWG - 350 kcmil
	30	15 (381)	38 (965)	115 (52)	
	42	21 (533)	44 (1118)	175 (80)	
400	18	9 (229)	56 (1422)	100 (45)	(2) #3/0-250 kcmil or
	30	15 (381)	62 (1575)	115 (52)	(1) #3/0-600 kcmil
	42	21 (533)	68 (1727)	175 (80)	

Table P1-6 – Branch Circuit Breakers

Breaker Type	Number of Poles	Max. Interrupting Rating (kA)					Available Trip Values
		120V	120/240V	240V	277V	480/277V	
BL	1	10	—	—	—	—	15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70
	2	—	10	—	—	—	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	3	—	—	10	—	—	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
BLR	2	—	—	10	—	—	15, 20, 30, 40, 50, 60, 70, 90, 100
BL, HID	1	10	—	—	—	—	15, 20, 30
	2	—	10	—	—	—	15, 20, 30
BLH	1	—	22	—	—	—	15, 20, 30, 40, 50, 55, 60, 70
	2	—	22	—	—	—	15, 20, 30, 40, 50, 60, 70, 90, 100
	3	—	—	22	—	—	15, 20, 30, 40, 50, 60, 70, 80, 90, 100
HBL	1	—	65	—	—	—	15, 20, 30, 40, 50
	2	—	65	—	—	—	15, 20, 30, 40, 50, 60, 70
	3	—	—	65	—	—	15, 20, 30, 40, 50, 60, 70, 80, 90, 100
BLF	1	10	—	—	—	—	15, 20, 30
	2	—	10	—	—	—	15, 20, 30, 40, 50, 60
BLHF	1	22	—	—	—	—	15, 20, 30
	2	—	22	—	—	—	15, 20, 30, 40, 50, 60
BGL ¹	2	10	—	—	—	—	15, 20, 30
	3	—	10	—	—	—	15, 20, 30
BLE	1	10	—	—	—	—	15, 20, 30
	2	—	10	—	—	—	15, 20, 30, 40, 50, 60
BLEH	1	22	—	—	—	—	20, 30
	2	—	22	—	—	—	15, 20, 30, 40, 50, 60
BAF	1	10	—	—	—	—	15, 20
BAFH	1	22	—	—	—	—	15, 20
BQD	1	—	65	—	14	—	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100
	2	—	65	—	—	14	
	3	—	—	65	—	14	
NGB ²	1	100	—	—	25	—	15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100, 125
	2	—	100	100	—	25	
	3	—	100	100	—	25	

¹ Two-pole breaker is one phase and neutral. Three-pole is two phases and neutral.

² P1 panel with NGB branch devices will not accept BL or BQD frames in the same panel as branch devices.

NOTE: BL, HBL and BQD breakers are mounted in common mountings in 3" or (6) pole increments.

Application

Type P1 Panelboards

Table P1-7 – Subfeed Breakers

Breaker Type	Number of Poles	Max. Interrupting Rating (kA)		Available Trip Values
		240V	480Y/277V	
QJ2	2, 3	10	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
QJH2	2, 3	22	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
QJ2H	2, 3	42	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
HQJ2H	2, 3	100	—	60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225
ED4	2, 3	65	18	15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100, 110, 125
HED4	2, 3	100	42	15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100, 110, 125
FXD6	2, 3	65	35	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250
FD6	2, 3	65	35	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250
HFD6	2, 3	100	65	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250
HFXD6	2, 3	100	65	70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250

Table P1-8 – Breaker Mounting Kit
Main or Subfeed w/o Breaker

Amp Rating	Breaker Frames	Service	Catalog Number
100	BL, BLH, HBL	1 Phase	MBKBL1
		3 Phase	MBKBL3
	BQD	3 Phase	MBKBC3
125	NGB	1 Phase	MBKNB1
		3 Phase	MBKNB3
	ED2, ED4, ED6, HED4, HED6	1 Phase	MBKED1
		3 Phase	MBKED3
225	QJ2, QJH2, QJ2-H	1 Phase	MBKQJ1
		3 Phase	MBKQJ3
250	FXD6, FD6, HFD	1 Phase	MBKFD1
		3 Phase	MBKFD3
400 ¹	JD2, JD6, JXD6, HJD6, HJXD6	1 Phase	MBKJD1
		3 Phase	MBKJD3

¹Main Only

Table P1-9 – Lug Kits Main or Feed-Thru

Amp Rating	Material	Wire Range	Service	Catalog Number
250	Al	(1) #6 AWG-350 Kcmil (Cu or Al)	1 Phase	MLKA1
		(1) #6 AWG-350 Kcmil (Cu or Al)	3 Phase	MLKA3
	Cu	(1) #6 AWG-350 Kcmil (Cu or Al)	1 Phase	MLKC1
		(1) #6 AWG-350 Kcmil (Cu or Al)	3 Phase	MLKC2
400	AL	(2) 3/0 - (1) 250 Kcmil or (1) 600 Kcmil	1 Phase	4MLKA1
		(2) 3/0 - (1) 250 Kcmil or (1) 600 Kcmil	3 Phase	4MLKA3
	Cu	(1) 600 Kcmil	1 Phase	4MLKC1
		(1) 600 Kcmil	3 Phase	4MLKC3

Table P1-10 – Copper Neutral Lug Kits – 250A and 400A

No. of Circuits	Description	Catalog Number
18	2 Branch Neutral Strips, 1 Main Neutral Lug, Hardware	CNLK18
30	2 Branch Neutral Strips, 1 Main Neutral Lug, Hardware	CNLK30
42	2 Branch Neutral Strips, 1 Main Neutral Lug, Hardware	CNLK42

Table P1-11 – 200% Neutral Lug Kits – 250A

No. of Circuits	Description	Catalog Number
18	2 Branch Neutral Strips, 2 Main Neutral Lug, Hardware	2NLK18
30	2 Branch Neutral Strips, 2 Main Neutral Lug, Hardware	2NLK30
42	2 Branch Neutral Strips, 2 Main Neutral Lug, Hardware	2NLK42

Table P1-12 – 200% Neutral Lug Kits – 400A

No. of Circuits	Description	Catalog Number
18	2 Branch Neutral Strips, 4 Main Neutral Lug, Hardware	42NLK18
30	2 Branch Neutral Strips, 4 Main Neutral Lug, Hardware	42NLK30
42	2 Branch Neutral Strips, 4 Main Neutral Lug, Hardware	42NLK42

Application

Type P1 Panelboards

Table P1-13 – Main Breaker Gutter Dimensions Inches (mm)

Main Breaker	Gutter		Neutral Location
	20" wide box	24" wide box	20" wide box
BL, BLH, HBL, BQD	8.500 (216)	10.500 (267)	11.500 (292)
NGB	8.000 (203)	10.000 (254)	11.500 (292)
ED2, ED4, ED6, HED4	6.125 (156)	8.125 (206)	11.500 (292)
QJ2, QJH2, QJ2-H	6.500 (165)	8.500 (216)	11.500 (292)
FD6, FXD6, HFD6	5.250 (133)	7.250 (184)	11.500 (292)
JD6, JXD6 ¹	15.000 (381)	15.000 (381)	26.750 (680)

¹ JD frame mounted vertically.

Table P1-14 – Main Lug End Gutter Dimensions Inches (mm)

Amp Rating	End Gutter		Neutral Location	
	20" wide box	24" wide box	20" wide box	24" wide box
125	10.500 (267)	10.500 (267)	11.500 (292)	11.500 (292)
250	10.500 (267)	10.500 (267)	11.500 (292)	11.500 (292)
400	25.500 (648)	25.500 (648)	26.750 (680)	26.750 (680)

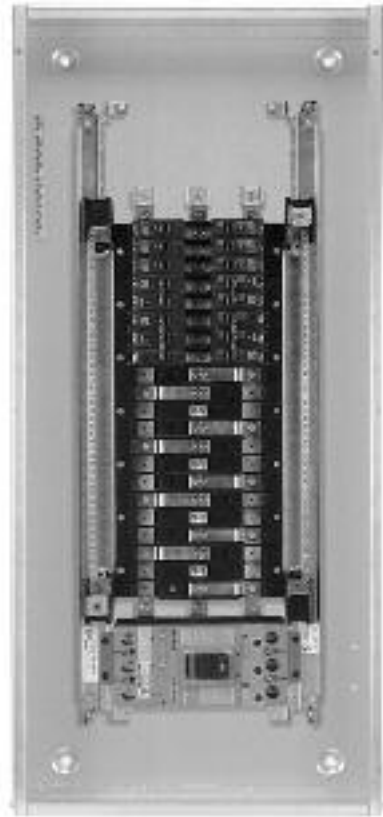
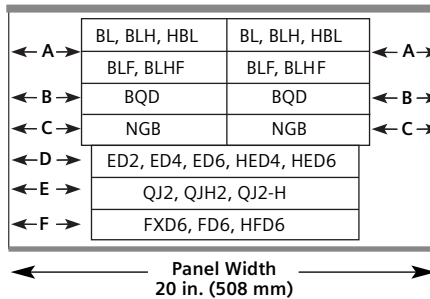
NOTE: Feed-thru lug and neutral wire bending space is 15.000" and 16.250" respectively on 400A panel.

Table P1-15 – Side Gutter Wiring Space Inches (mm) (Fig P1-1)

Reference Letter	Panel Width 20"	Panel Width 24" Optional
A	6.375 (162)	8.375 (213)
B	5.500 (140)	7.500 (191)
C	5.000 (127)	7.000 (178)
D ¹	6.125 (156)	8.125 (206)
E ¹	6.500 (165)	8.500 (216)
F ¹	5.250 (133)	7.250 (184)

¹ Subfeed mounting limit 1 per panel.

Fig P1-1



Typical Catalog Numbers

Type P1 Panelboards

Table P1-16 – Main Lugs Only

Maximum Panel Amp Rating	Maximum 1-Pole Circuits	Box Height (inches)	Catalog Number		
			3Ø4W 208Y/120V	1Ø3W 120/240V	3Ø4W 480Y/277V
125	18	32	P1C18ML125ATS	P1A18ML125ATS	P1E18ML125ATS
	30	38	P1C30ML125ATS	P1A30ML125ATS	P1E30ML125ATS
	42	44	P1C42ML125ATS	P1A42ML125ATS	P1E42ML125ATS
250	18	32	P1C18ML250ATS	P1A18ML250ATS	P1E18ML250ATS
	30	38	P1C30ML250ATS	P1A30ML250ATS	P1E30ML250ATS
	42	44	P1C42ML250ATS	P1A42ML250ATS	P1E42ML250ATS
400	18	56	P1C18ML400ATS	P1A18ML400ATS	P1E18ML400ATS
	30	62	P1C30ML400ATS	P1A30ML400ATS	P1E30ML400ATS
	42	68	P1C42ML400ATS	P1A42ML400ATS	P1E42ML400ATS

Table P1-17 – Main Circuit Breaker

100	18	32	P1C18BL100ATS	P1A18BL100ATS	P1E18BD100ATS
	30	38	P1C30BL100ATS	P1A30BL100ATS	P1E30BD100ATS
	42	44	P1C42BL100ATS	P1A42BL100ATS	P1E42BD100ATS
125	18	32	P1C18NB125ATS	P1A18NB125ATS	P1E18NB125ATS
	30	38	P1C30NB125ATS	P1A30NB125ATS	P1E30NB125ATS
	42	44	P1C42NB125ATS	P1A42NB125ATS	P1E42NB125ATS
225	18	32	P1C18QJ225ATS	P1A18QJ225ATS	P1E18QJ225ATS
	30	38	P1C30QJ225ATS	P1A30QJ225ATS	P1E30QJ225ATS
	42	44	P1C42QJ225ATS	P1A42QJ225ATS	P1E42QJ225ATS
250	18	32	P1C18FX250ATS	P1A18FX250ATS	P1E18FX250ATS
	30	38	P1C30FX250ATS	P1A30FX250ATS	P1E30FX250ATS
	42	44	P1C42FX250ATS	P1A42FX250ATS	P1E42FX250ATS
400	18	56	P1C18JX400ATS	P1A18JX400ATS	P1E18JX400ATS
	30	62	P1C30JX400ATS	P1A30JX400ATS	P1E30JX400ATS
	42	68	P1C42JX400ATS	P1A42JX400ATS	P1E42JX400ATS

Table P1-18 – Standard Enclosures

Box Height (in.)	Catalog Number				
	Type 1 Standard Trim			Type 3R	Type 3R/12
	Box	Surface	Flush		
32	B32	S32B	F32B	NR32	WP32
38	B38	S38B	F38B	NR38	WP38
44	B44	S44B	F44B	NR44	WP44
56	B56	S56B	F56B	NR56	WP56
62	B62	S62B	F62B	NR62	WP62
68	B68	S68B	F68B	NR68	WP68

Standard Modifications

Type P1 Panelboards

Panel Options

Enclosures

- Extra gutter to sides or ends of the can
- 24" wide boxes
- Hinged trims
- Door-in-door trims
- Screw to the box trims
- Painted boxes
- Custom colors
- Increase gauge trims and boxes
- Stainless steel trims and boxes, Type 1
- Aluminum trims and boxes, Type 1

Panel Modifications

- Main Bus
Standard main bus is tin-plated aluminum. For copper main bus, add from the table for each panel. Includes copper neutral cross bar. For copper neutral branch lugs, see miscellaneous.
- Compression lug for MLO¹
- Contactor mains - Mount in 23" enclosure ahead of panel.
 - Asco 920 through 225 amps³
 - Asco 911 through 150 amps³
 - Siemens LEN through 30 amps³
- Branch and main breaker accessories
 - Handle blocks
 - Handle locks
- Feed-thru lugs¹
Cannot be used in conjunction with TVSS or subfeed breakers. Do not add height to the panel.

Amp Rating	Type	Connector Cu/Al Range
250	Al Lay-in Mechanical	(1) - #6 AWG - (1) 350 Kcmil
250	Cu Lay-In Mechanical	(1) - #6 AWG - (1) 350 Kcmil
250	Al Compression	(1) - #6 AWG - (1) 350 Kcmil
400	Al Mechanical	(2) - #4 AWG - (1) 600 Kcmil

- 200% neutral¹
- Copper lugs, mechanical line and branch neutral¹

- NEMA 3R enclosures
- NEMA 3R/12 enclosures
- NEMA 4 enclosures
- NEMA 4X enclosures
- Special keyed locks
 - TEY
 - TEU1
 - Cat 60
 - LL803
 - LL806
 - Yale
- Panel skirts
- Gaskets between trim and box

- Bus mounted TVSS¹
- Service entrance labeling
- Grounding of Panelboards
Ground Bars except for brazed to box are shipped with the panel interior factory mounted.
 - Non-Insulated Equipment Ground Bar – Standard
 - Copper Non-Insulated Ground Bar
 - Al Insulated Equipment Ground Bar
 - Cu Insulated Equipment Ground Bar
 - Ground Bar Brazed to Box (recommended for painted boxes)
- Shunt Trip on Main or Branch
BL², BLH², HBL², BQD², NGB² as branch use 1" unit space for shunt trip.

QJ2, QJ2-H, QJH2, ED2, ED4, ED6, HED4, HED6, HHED6, FD6, FXD6, HFD6, HFXD6, JXD6, JD6, HJD6, HJXD6, HQJ2H

- Remote control switches – 480V AC max. mounted in a 23" enclosure to be cable connected to the panel.
- Time Clocks – 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.

Description

Time Clock (1-or 2-Pole, Single or Double Throw Contacts;
3-Pole Single Throw)

277V Maximum with Plain Dial

Options:

Astronomical Dial

An Omitting Device

Reserve Power or Carryover

Space and Mounting Provisions Only

¹ Do not increase panel or enclosure size

² Accessories on 1" pole breakers (BL, BQD, NGB, ED) will take 1" unit space.

³ External to the panel, supplied in a separate enclosure.

Connector Modifications

Type P1 Panelboards

Compression Lugs

Table P1-19 – Lugs

Style	Amp Rating	Breaker Type	Compression Connectors	Box Height Addition
MLO	250	N/A	(1)#4 AWG - 350 Kcmil	None
	400	N/A	(1) 250-600 Kcmil or (2)#3/0 AWG - 250 Kcmil	
Main Breaker	125	ED4, ED6, HED4	(1)#12-1/0 AWG	Box must be increased to 24" wide
		HHED6, CED6		
	225	QJ2, QJH2, QJ2H	(1)#6 AWG - 350 Kcmil Cu or Al	
	250	FXD6, HFD6, FD6	(1)#6 AWG - 350 Kcmil Cu or Al	

NOTE: Standard compression lugs used for P1 panels are range taking lugs and may require a particular crimping tool to accommodate the range. Consult factory for information.

Enclosure Modifications

NEMA-4 For Type P1
Water Tight, Dust Tight, Steel Enclosure

Table P1-20

Box Height (inches)	Enclosure Size		
	H	W	D
26	26	20	5.75
32	32		
38	38		
44	44		
50	50		
56	56		
62	62		
68	68		
74	74		

Table P1-22 – Additional Enclosure Modifications

Description
Strip Heaters
Humidstat Control
Thermostat Control

NEMA-4X For Type P1
Water Tight, Dust Tight and Corrosion Resistant
(consult plant to verify actual enclosure size)

Table P1-21

Box Height (inches)	Enclosure - Stainless Steel and Steel with Epoxy Coating			Enclosure - Stainless Steel and Steel w/Epoxy Coating ¹		
	H	W	D	H	D	W
26	26	20	5.75	36	30	8
32	32			36	30	8
38	38			48	36	12
44	44			48	36	12
50	50			60	36	12
56	56			60	36	12
62	62			—	—	—
68	68			—	—	—
74	74			—	—	—

¹ Limited to sizes shown.

Remote Switch Modifications

Table P1-23 – Control Power Transformer

Size	VA Relay
0,1	50
2	75
3	150
4	250

Table P1-25 – Remote Control Switch Modification

Description
Separate Door in Deadfront Over Switch
Auxiliary Contacts (mounted, not wired)
2-Wire Control

Table P1-24 – Applications for a Remote Switch

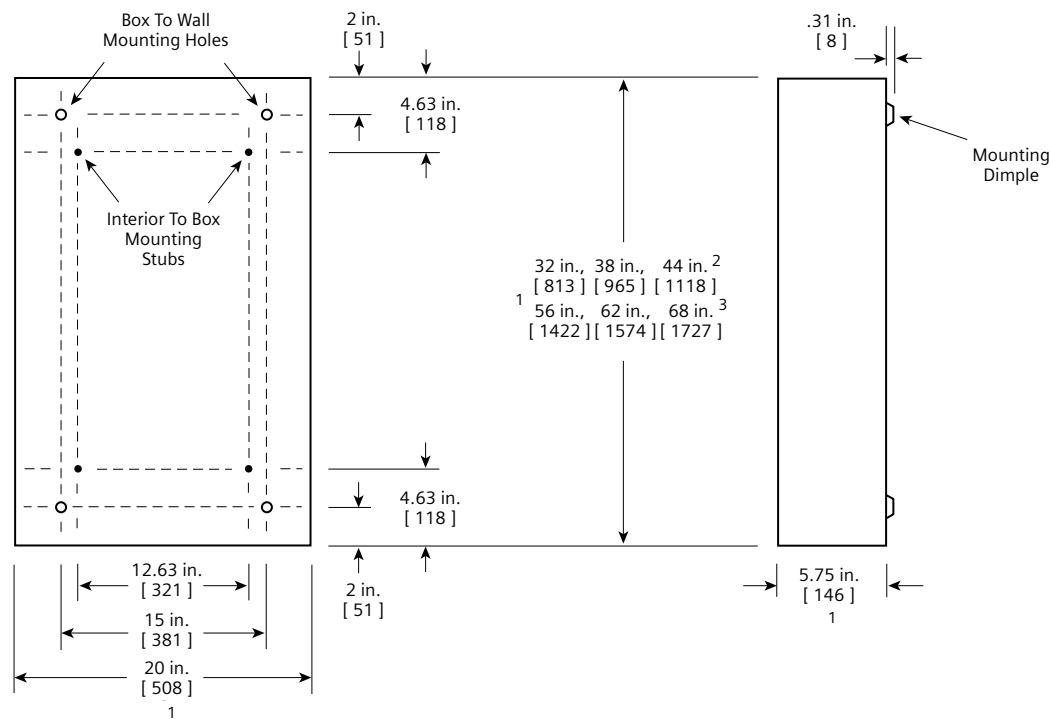
Switch Type	Modification
920	Mounts in 23" relay cabinet as a main only
911	≤ 150 AMPS mounts in 23" relay cabinet as a main only >150 AMPS not available
LEN	30A mounts in 23" relay cabinet as a main only

Dimensions

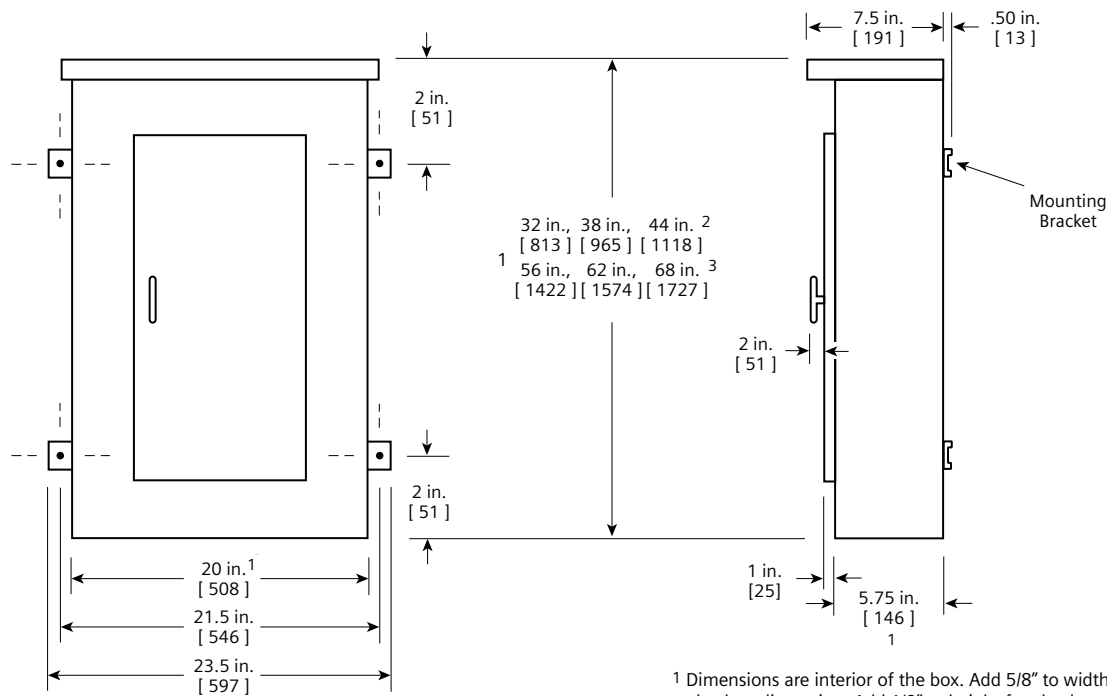
Type P1 Panelboards

Type 1 Box

Box is symmetrical



Type 3R and 3R/12 Box



¹ Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension.
² 250 Amp panel.
³ 400 Amp panel.

Dimensions shown in inches and millimeters [].