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Pow-R-Line Xpert instant switchboard

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Product Overview

Eaton's Instant Switchboards are designed as distributor-stocked units to provide fast delivery to match the needs of the construction market.

Suitable for use as service entrance equipment, they combine utility metering provisions with a fused main switch in a single compact section that can also include a distribution panel for feeder and branch circuit breakers.

Typical applications for these versatile switchboards include small office buildings and factories, stores, supermarkets and shopping centers.

Construction

These switchboards are available in either indoor or outdoor enclosures manufactured of code gauge steel with a durable light gray finish. All units are completely enclosed with front, rear and side covers. Outdoor units include a front hinged door.

The service section includes:

- Main lugs mounted at the top (two #4–600 kcmil per phase) for overhead feed or for use with underground pull section
- A metering and CT compartment with bussing for utility bar type CTs and two 15.00-inch (381.0 mm) high meter compartment doors—one with meter socket provision, one blank
- A 400 or 600 AT-fused main switch or 800 A main circuit breaker with either load lugs (same as main lugs) or with connections to a factory-installed distribution panel

Underground pull sections are available with lug landing kits, providing studs for incoming cables per EUSERC requirements and two #4–600 kcmil lugs per phase for cable connection to the service section.

Distribution panels can be included for 240 Vac maximum (single-phase, three-wire, or three-phase, four-wire) or for 480Y/277 Vac (three-phase, four-wire). The 240 V panels have provisions for four two-pole or three-pole, 225 A frame circuit breakers; and 24 poles of 100 A frame circuit breakers. The 480Y/277 V panel has provisions for four two-pole or three-pole 225 A frame circuit breakers; and 24 poles of 100 A frame circuit breakers. Distribution panel for 800 A 240 Vac or 480Y/277 Vac can be included with provisions for six two- or three-pole, 225 A frame circuit breakers.

For applications that require the load circuit conductors to exit at the top, a loadside wireway compartment is available that bolts to the service section.

Standards

Instant Switchboards are UL 891 listed and comply with all applicable industry standards. These switchboards meet EUSERC requirements.

Service Ratings

- 240 Vac, single-phase, three-wire, or three-phase, four-wire
- 480Y/277 Vac, three-phase, four-wire

Interrupting Ratings (Series Rating)

- 65,000 rms symmetrical amperes at 240 Vac, with 400 and 600 A fusible switch mains using 65,000 AIC ED 225 A frame or 10,000 AIC BAB 100 A frame branch breakers
- 65,000 rms symmetrical amperes at 480Y/277 Vac, with 400 and 600 A fusible switch mains using 35,000 AIC FD 225 A frame or 14,000 AIC GHB 100 A frame branch breakers
- 35,000 rms symmetrical at 480Y/277 Vac fully rated using 800 A main circuit breaker with PDG2xG 225 A frame branch breakers

Dimensions

- Indoor: 32.00 x 90.00 x 14.00 inches (812.8 x 2286.0 x 355.6 mm)
- Outdoor: 38.00 x 90.00 x 26.00 inches (965.2 x 2286.0 x660.4 mm)

Type 1 Indoor

Type 3R Outdoor

Table 21.8-1. Instant Switchboards

Service	Main Ampere Rating	Catalog Number	
		NEMA 1—Indoor	NEMA 3R—Outdoor
240 Vac Maximum—Main Fused Switch Only			
Single-phase, 3W	400 600	**MSB423** **MSB623**	**RMSB423** **RMSB623**
Three-phase, 4W	400 600	**MSB424** **MSB624**	**RMSB424** **RMSB624**
240 Vac Maximum—Main Fused Switch with Distribution Panel			
Single-phase, 3W	400 600	**MSBP423** **MSBP623**	**RMSBP423** **RMSBP623**
Three-phase, 4W	400 600	**MSBP424** **MSBP624**	**RMSBP424** **RMSBP624**
240 Vac Maximum—Main Circuit Breaker Only			
Three-phase, 4W	800	**MSB824**	**RMSB824**
240 Vac Maximum—Main Circuit Breaker Only with Distribution Panel			
Three-phase, 4W	800	**MSBP824**	**RMSBP824**
480Y/277 Vac ① —Main Fused Switch Only			
Three-phase, 4W	400 600	**MSB444** **MSB644**	**RMSB444** **RMSB644**
480Y/277 Vac ① —Main Fused Switch with Distribution Panel			
Three-phase, 4W	400 600	**MSBP444** **MSBP644**	**RMSBP444** **RMSBP644**
480Y/277 Vac Maximum ① —Main Circuit Breaker Only			
Three-phase, 4W	800	**MSB844**	**RMSB844**
480Y/277 Vac Maximum ① —Main Circuit Breaker Only with Distribution Panel			
Three-phase, 4W	800	**MSBP844**	**RMSBP844**

① Not for use on 480 V three-phase three-wire delta systems.

Note: Standard switchboards include two 15.00-inch (381.0) high meter compartment doors: one with single meter socket provision and one blank. For other arrangements, use accessories.

Table 21.8-2. Meter Compartment Doors (Meter Sockets Not Included)

Door Size Inches (mm)	Drilling	Catalog Number
15.00 H x 32.00 W (381.0 x 812.2)	Blank 1 socket	**MD150** **MD151**
30.00 H x 32.00 W (762.0 x 812.2)	Blank 2 socket	**MD300** **MD302**

Table 21.8-3. Meter Sockets—For Field Installation (order separately)

Number of Jaws	Catalog Number
4 5 6	**M4** **M5** **M6**
8 13 15	**M8** **M13** **M15**

Table 21.8-4. Loadside Wireway—Same Depth as Switchboard

Section Width Inches (mm)	Catalog Number	
	NEMA 1— Indoor	NEMA 3R— Outdoor
12.00 (304.8)	**LSS12W**	**RLSS12W**

Table 21.8-5. Underground Pull Sections

Section Width Inches (mm)	Catalog Number	
	NEMA 1— Indoor	NEMA 3R— Outdoor
24.00 (609.6) 30.00 (762.0)	**UG24W** **UG30W**	**RUG24W** **RUG30W**

Note: Same depth as switchboard with provisions for lug landing kit.

Note: If pull section is to be installed separate from service section, add side closer plates. Cat No. UGCP.

Table 21.8-6. Lug Landing Kits for Underground Pull Sections

Maximum Ampere Rating	Service	Catalog Number
400	Single-phase, 3W Three-phase, 4W	**LL4003** **LL4004**
800	Single-phase, 3W Three-phase, 4W	**LL8003** **LL8004**

Table 21.8-7. Distribution Breakers

Ampere Rating	Breaker Type	Poles		
		1P	2P	3P
240 Vac				
15–60 70–100 125–225	BAB BAB PDD2xG	■ — —	■ ■ ■	■ ■ ■
480Y/277 Vac				
15–100 70–225	GHB PDG2xG	■ —	■ ■	■ ■

Circuit Breaker and Fusible Switches

Table 21.8-8. Molded Case Circuit Breakers

Circuit Breaker Type	Continuous Ampere Rating at 40 °C	Number of Poles	Voltage		Trip Type ①	UL Listed Interrupting Ratings rms Symmetrical Amperes									
						AC Ratings Volts						DC Ratings Volts ②			
			AC	DC		120	120/240	240	277	480	600	125	250	125/250	600
PDD2xF	100–225	2, 3	240	125	N.I.T.	—	—	22	—	—	—	10	—	—	—
PDD2xG	100–225	2, 3	240	125	N.I.T.	—	—	65	—	—	—	10	—	—	—
PDD2xM	100–225	2, 3	240	125	N.I.T.	—	—	100	—	—	—	10	—	—	—
PDD2xP	100–225	2, 3	240	125	N.I.T.	—	—	200	—	—	—	10	—	—	—
PDG2xF	15–100	1	277	125	N.I.T.	—	—	—	14	—	—	10	—	—	—
PDG2xF	15–100	2, 3	480	250	N.I.T.	—	—	18	—	14	—	—	10	—	—
HFDDC ③	15–150	2, 3	—	600	N.I.T.	—	—	—	—	—	—	42	42	—	35
PDG2xG	15–225	1	277	125	N.I.T.	—	—	—	35	—	—	10	—	—	—
PDG2xG	15–225	2, 3	600	250	N.I.T.	—	—	65	—	35	18	—	10	—	—
PDG2xG	15–225	4	600	250	N.I.T.	—	—	65	—	35	18	—	10	—	—
PDG2xM	15–225	1	277	125	N.I.T.	—	—	—	65	—	—	10	—	—	—
PDG2xM	15–225	2, 3	600	250	N.I.T.	—	—	100	—	65	25	—	22	—	—
PDG2xM	15–225	4	600	250	N.I.T.	—	—	100	—	65	25	—	22	—	—
PDG2xP	15–225	2, 3	600	250	N.I.T.	—	—	200	—	100	35	—	22	—	—
PDG2xP	15–225	4	600	250	N.I.T.	—	—	200	—	100	35	—	22	—	—
HJDDC ③	70–250	2, 3	—	600	I.T.	—	—	—	—	—	—	42	42	—	35
PDG3xGy	250–400	2, 3	240	250	N.I.T.	—	—	65	—	—	—	—	10	—	—
PDG3xG*	70–400	2, 3	600	250	I.T.	—	—	65	—	35	25	—	10	—	—
PDF3xG* ④	70–400	3	600	250	I.T.	—	—	65	—	35	25	—	10	—	—
PDG3xM*	70–400	2, 3	600	250	I.T.	—	—	100	—	65	35	—	22	—	—
PDF3xM ④	70–400	3	600	250	I.T.	—	—	100	—	65	35	—	22	—	—
PDD3xP*	70–400	2, 3	600	250	I.T.	—	—	200	—	100	50	—	22	—	—
HKDDC ③	100–400	2, 3	—	600	I.T.	—	—	—	—	—	—	42	42	—	35
LHH ⑤	125–400	2, 3	600	250	I.T.	—	—	100	—	65	35	—	42	—	—
NHH	150–350	3	600	—	—	—	—	100	—	65	35	—	—	—	—
PDG3xG* ⑥	300–600	2, 3	600	250	I.T.	—	—	65	—	35	25	10	22	—	—
PDG3xM* ⑥	300–600	2, 3	600	250	I.T.	—	—	100	—	65	35	10	22	—	—
PDG3xP* ⑤⑥	250–600	2, 3	600	250	I.T.	—	—	200	—	100	50	—	42	—	—
PDG4xG ⑤	400–800	2, 3	600	250	N.I.T.	—	—	65	—	50	25	—	22	—	—
PDF4xG ④⑥	400–800	3	600	—	N.I.T.	—	—	65	—	50	25	—	22	—	—
PDG4xM ⑤	400–800	2, 3	600	—	N.I.T.	—	—	100	—	65	35	—	25	—	—
PDF4xM ④⑥	400–800	3	600	—	N.I.T.	—	—	100	—	65	35	—	25	—	—
HMDLDC ③	300–800	2, 3	—	600	I.T.	—	—	—	—	—	—	42	42	—	—
PDG5xM	600–1200	2, 3	600	—	N.I.T.	—	—	100	—	65	35	—	—	—	—
PDG5xP	600–1200	2, 3	600	—	N.I.T.	—	—	200	—	100	50	—	—	—	—
NBDC ③	700–1200	2, 3	—	600	I.T.	—	—	—	—	—	—	42	42	—	50
PDG6xP* 1600	700–1600	3	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	—
PDG6xP* 2000	1000–2000	3	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	—
PDG6xP* 2500	1000–2500	3	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	—
PDG6xP* ③⑦	1600–2000	2, 3	—	600	I.T.	—	—	—	—	—	—	42	65	—	65

① N.I.T. is non-interchangeable trip unit. I.T. is interchangeable trip unit.
② Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250 Vdc.
③ For use on DC systems only.
④ 100% rated.
⑤ Not available in Pow-R-Line *i*X switchboards.
⑥ Available in bolt-on fixed mount or drawout feeder device.
⑦ Individually, vertically mounted.

Table 21.8-9. Electrical Characteristics of Fusible Switches

Device Type	System Voltage	Ampere Rating	Interrupting Capacities kA Symmetrical Amperes
Fusible switch	240 or 600	30–600 300–1200 30–600 800, 1200	200 kAIC with Class R Fuses 200 kAIC with ClassT Fuses 200 kAIC with Class R and J Fuses 200 kAIC with Class L Fuses
Bolted pressure switch	240 or 480	800, 1200, 1600 2000, 2500, 3000, 4000, 5000 ①	200 kAIC with Class L Fuses 200 kAIC with Class L Fuses 200 kAIC with Class L Fuses

① 5000 A bolted pressure contact switch is not UL listed.

Table 21.8-10. Standard Switchboard Terminals Standard Main Breaker, Branch Breaker, Main Switch or Branch Switch Terminals

Breaker Type	Ampere Rating	Wire Size Ranges
PDD2xF, PDD2xG, PDD2xM, PDD2xP	100–225	# 4–#4/0 or # 6–300 kcmil
PDG2xF, PDG2xG, PDG2xM PDG2xP	15–100 125–225	#14–#1/0 # 4–#4/0 or #6–300 kcmil
PDD3xGy	250–350 400	(1) 25–500 kcmil (2) 3/0–250 kcmil or (1) 3/0–500 kcmil
PDG3xG*, PDG3xM*, PDG3xP*, PDF3xG* ②, PDF3xM* ②	100–225 250–350 400	(1) #3–350 kcmil (1) 250–500 kcmil (2) 3/0–250 kcmil (1) 3/0–500 kcmil
PDG3xG*, PDG3xM*, LD ②, LHH, PDG3xP*, NHH	300–500 600 150–350	(2) 250–350 kcmil (2) 400–500 kcmil (1) #2–600 kcmil
PDG4xG, PDF4xG ②, PDG4xM, PDF4xM	400–600 700–800	(2) #1–500 kcmil (3) 3/0–400 kcmil (2) 500–750 kcmil
PDG5xM, PDG5xP, PDG6xM ②, PDG5xP ②	600–1000 1200	(3) 3/0–400 kcmil (4) 4/0–500 kcmil

② 100% rated breaker.

Note: All terminal sizes are based on wire ampacities corresponding to those shown in NECTable 310.16 under the 75 °C insulation columns (75 °C wire).The use of smaller size (in circular mills), regardless of insulation temperature rating is not permitted without voiding UL labels on devices and equipment.

Note: For other terminals available on some ratings of molded case circuit breakers and fusible switches, refer to Molded Case Circuit Breakers & Enclosures Design Guides.

Cable Ranges for Standard Secondary Device Terminals

Wire and cable terminals supplied on switchboard mounted devices for making up incoming or outgoing cable connections are of the mechanical screw clamp pressure type. All standard terminals are suitable for use with either aluminum or copper cable except as noted in the table. Panel mounted devices use the standard terminal provided with that device.

Table 21.8-11. Fusible Switches

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

Table 21.8-12. Standard Mechanical Incoming Terminal Ranges for Main Lugs Only and Main Devices Including Circuit Breakers and Fusible Devices

Ampere Rating	Cable Range
400 600 800	(2) #2–500 kcmil (2) #2–500 kcmil (3) #2–500 kcmil
1000 1200 1600	(4) #2–500 kcmil (4) #2–500 kcmil (5) #2–500 kcmil
2000 2500 3000	(6) #2–500 kcmil (7) #2–500 kcmil (10) #2–500 kcmil

Table 21.8-13. Range Taking Compression Main Terminals ③

Main Ampere Rating	Number of Conductors and Wire Range Per Phase	
	Aluminum Conductors	Copper Conductors
1200 1600 2000 2500	(4) 500–750 kcmil (5) 500–750 kcmil (6) 500–750 kcmil (7) 500–750 kcmil	(3) 500–750 kcmil (4) 500–750 kcmil (4) 500–750 kcmil (6) 500–750 kcmil
3000 4000 5000	(8) 500–750 kcmil (11) 500–750 kcmil (13) 500–750 kcmil	(7) 500–750 kcmil (9) 500–750 kcmil (11) 500–750 kcmil

③ Compression terminations will take a range of conductors and include 500, 600, 700 and 750 kcmil.

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Printed in USA
Publication No. DG015008EN / Z23483
February 2020

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