

POWERBUS™ 225 Busway and Plug-In Units

Class 5600



CONTENTS

Description	Page
Product Descriptions	3
POWERBUS™ 225 Busway System	3
General Information	3
Physical and Electrical Data	4
Catalog Numbering System	5
Dimensions—Straight Lengths, Fittings, and Accessories	6
POWERBUS™ 225 Plug-In Units	8
General Information	8
Catalog Numbering System	9
Plug-In Units (Ready-to-Assemble)	10
Plug-In Units (Factory-Assembled)	11
Plug-In Unit Accessories	12
Suggested Specifications	13

Merlin Gerin

Modicon

Square D

Telemecanique

Schneider Electric Brands



PRODUCT DESCRIPTIONS

POWERBUS™ 225 is the latest in a long line of successful high-quality busway systems manufactured by Schneider Electric. This new plug-in busway was designed specifically to address the low power distribution needs of industrial and commercial customers. We have applied our 50 years of experience in the busway business to develop a reliable low power distribution system that will reduce installation time and cost, as well as provide the flexibility to make future modifications quickly and easily to processes and facilities.

POWERBUS 225 BUSWAY SYSTEM

General Information

POWERBUS 225 construction consists of a light-weight electrical grade all-aluminum housing with silver-plated copper conductor bars for maximum electrical efficiency. The total product offering includes straight sections, fittings, accessories, and plug-in units for a total installation. This new busway is available in two power ratings: 225 A (240 V) and 100 A (600 V).

Straight sections of busway are offered in 4 and 10 ft (48 and 120 in.) lengths. Fittings include left and right elbows, tap boxes, and crosses, with accessory items such as hangers, end closures, and wall flanges completing the basic system. There are 10 plug-in openings per 10 ft (120 in.) of straight section of busway, with each opening rated IP2x against solid object ingress (International Standards IP Protection Classification). Plug-in units are available in a wide variety of ready-to-assemble and factory-assembled devices.

Sprinkler-Proof Busway System

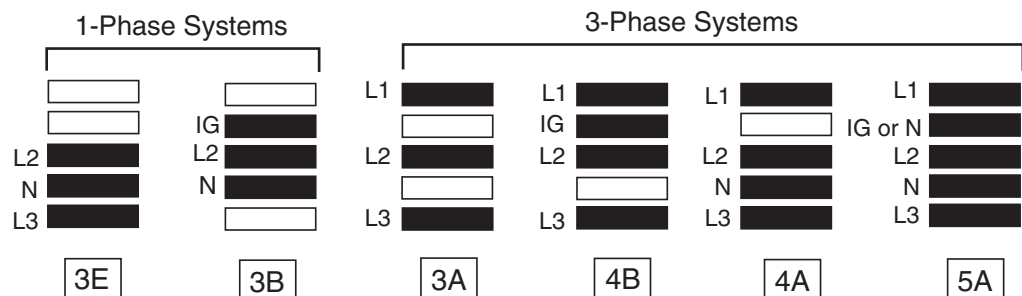
System reliability and zero downtime is a major concern to busway users. We have designed POWERBUS 225 to meet the stringent requirements of the International Standard IEC-60529 to ensure that failures because of contamination, especially water, are avoided.

The straight sections and fittings are all protected to IP-54 as standard. This means they are protected from dust that would interfere with the operation of the equipment, as well as water sprayed or splashed from all around the busway at a rate of 2.64 gal/minute (10 L/min).

POWERBUS 225 plug-in units are protected to IP-40 as standard. This means they are protected from entry of solid objects with a diameter or thickness of 0.039 in. (1 mm) or greater. The system degree of protection can be increased to IP-43 (PBPQOR only) or IP-54 with the installation of an optional sealing boot accessory. IP-43 provides protection from water sprayed at up to 60° from the vertical, while IP-54 provides dust and water protection to match the busway.

Busbar Configuration

POWERBUS 225 can be supplied with up to five (5) conductor bars to accommodate a wide range of electrical systems. This includes 200% neutral capability to address applications where harmonic currents are a concern. In applications where 200% neutrals are not required, POWERBUS 225 can provide an isolated ground for electrical systems that require a “clean” ground, in addition to the standard integral ground.



POWERBUS™ 225

POWERBUS 225 Busway System

Maintenance-Free Joint

For maximum reliability, the POWERBUS 225 joint employs a high-pressure, spring-type copper connection that requires no maintenance after installation.

Physical and Electrical Data

Short-Circuit Rating

Product	Short-Circuit Current Rating KA, RMS Symmetrical		Impedance ‡ Line-to-Neutral (milliohms / 100 ft)			DC Resistance ‡ of Aluminum Housing Ground (milliohms / 100 ft)
	UL Three-Cycle Test	Series-Connected with Fuse †	R	X60 Hz	X50 Hz	
225 A	22 KA	200 KA	6.40	4.00	3.33	1.15
100 A	14 KA	200 KA	15.34	7.59	6.32	1.25

† Busway connected in series with a Class J or Class T fuse

‡ Busway impedance and housing ground resistance are at 80 °C (176 °F) operating temperature







Voltage Drop

Product	Voltage Drop (60 Hz @ Rated Load) (Average Phase Line-to-Line Voltage Drop in Volts / 100 ft for Varying Power Factors)					
	100%	90%	80%	70%	60%	50%
225 A	2.494	2.923	2.929	2.858	2.742	2.596
100 A	2.657	2.964	2.914	2.799	2.646	2.467

Notes:

- Values shown are based on single concentrated load at the end of a busway run. For distributed loading, divide the values shown by two (2).
- For balanced 3-phase line-to-line voltage drop of 4-wire busway, use values from the table above.
- For balanced 3-phase line-to-neutral voltage drop, multiply values by 0.577.
- For single-phase voltage drop, multiply values by 1.15.
- For other than rated current, multiply values by the ratio of: $\frac{\text{Actual Current}}{\text{Rated Current}}$
- For total voltage drop, multiply values by the ratio of: $\frac{\text{Actual Length}}{100 \text{ ft}}$
- Voltage drop calculations for 50 Hz can be made by substituting the appropriate value from Table 1. For other frequency values, contact Square D / Schneider Electric at 1-888-778-2733.

Physical Data

Product	Weights (Based on Busbar Configuration)						Busbar Size (The same bar size is used for all configurations.)
	3 bar			4 bar		5 bar	
							
	3E	3B	3A	4B	4A	5A	
225 A	4.5 lb/ft			5.1 lb/ft		5.8 lb/ft	.125 x 1.375 inches (3 x 35 mm)
100 A	2.9 lb/ft			3.2 lb/ft		3.4 lb/ft	.125 x 0.500 inches (3 x 13 mm)

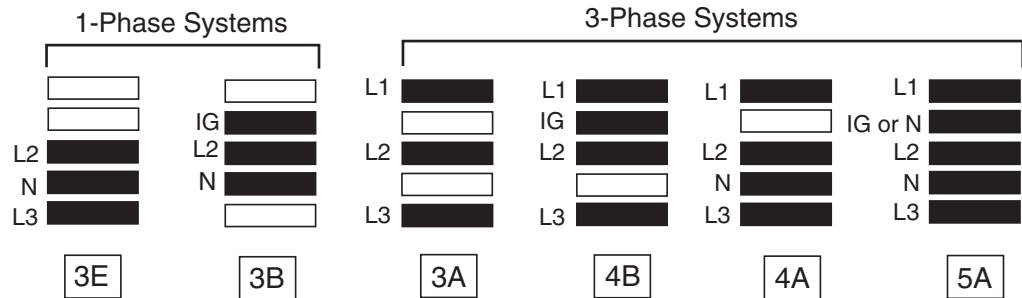


Catalog Numbering System

Busway Catalog Numbering System

PB	CP	4A Busbar Configuration	225 Amperage Rating	ST Type of Device	120 Length
PB = POWERBUS	CP = Copper Plug-In CF = Copper Fitting	Refer to the "Busbar Configuration Table" below.	100 = 100 A 225 = 225 A	ST = Straight Length	120 = 10 ft 48 = 4 ft
				LL = Elbow Left	
				LR = Elbow Right	
				CR = Cross	
				TB = End Tap Box	

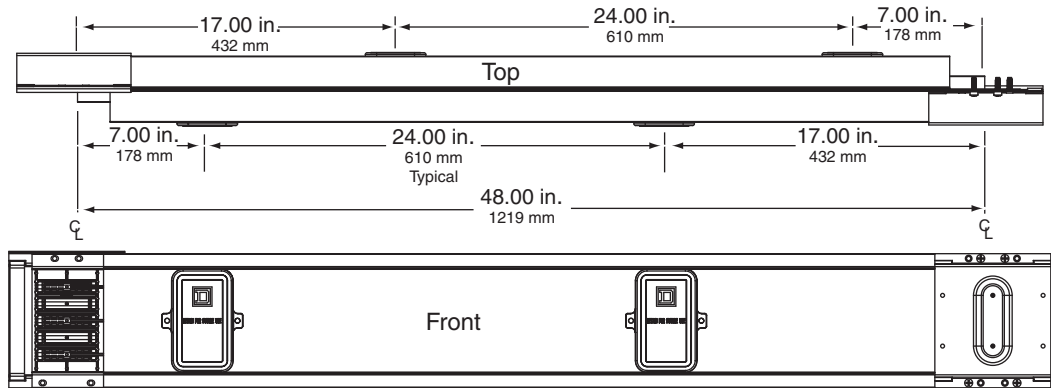
Busbar Configuration Table



POWERBUS™ 225
POWERBUS 225 Busway System

Dimensions—Straight Lengths, Fittings, and Accessories

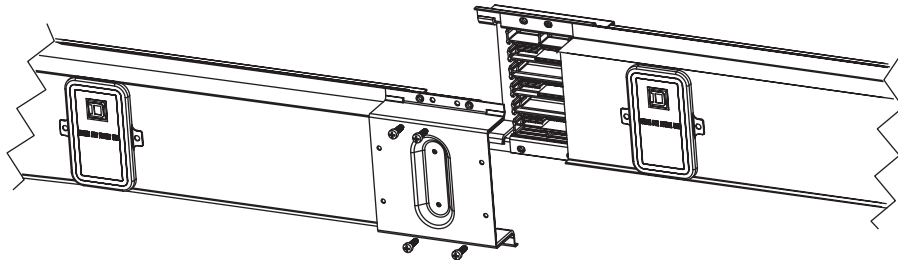
Straight Lengths



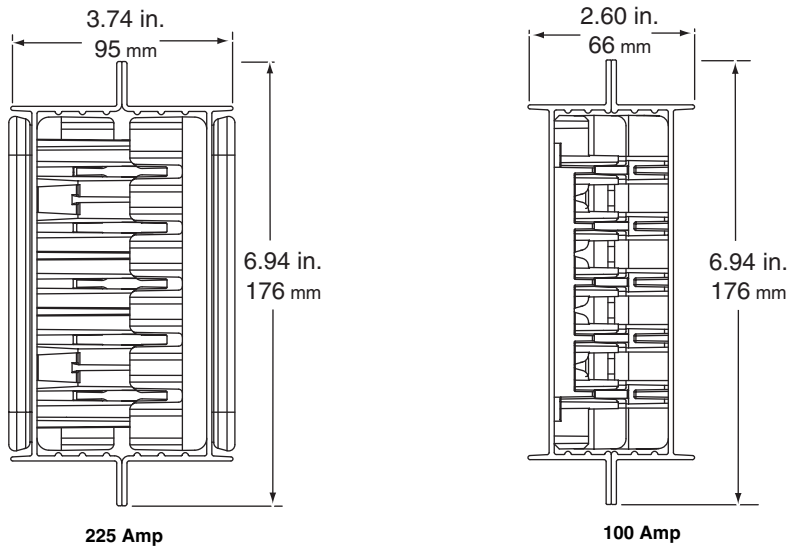
Catalog Number: PBCP[‡]225ST048

‡ To complete the catalog number, insert the configuration type from the "Busbar Configuration Table" on page 5.
 NOTE: Four-foot straight length shown for clarity. Ten-foot straight length is similar.

Joint Detail

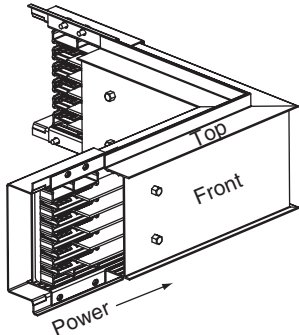


Cross Sections



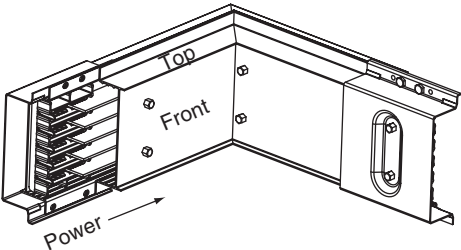
POWERBUS™ 225
POWERBUS 225 Plug-In Units

Elbow Left



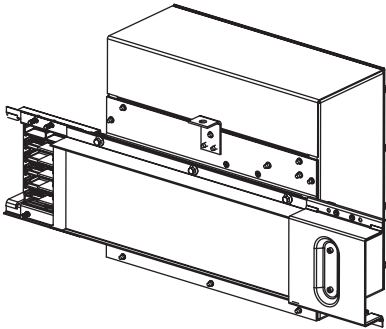
Catalog Number:
 225 A = PBCF[‡]225LL
 100 A = PBCF[‡]100LL

Elbow Right



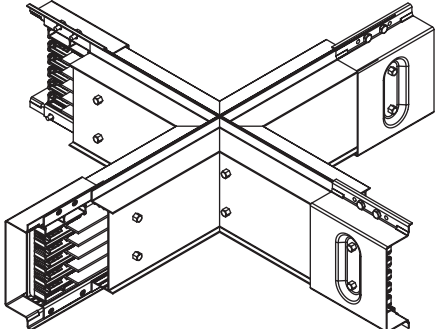
Catalog Number:
 225 A = PBCF[‡]225LR
 100 A = PBCF[‡]100LR

Tap Box



Catalog Number:
 225 A = PBCF[‡]225TB
 100 A = PBCF[‡]100TB

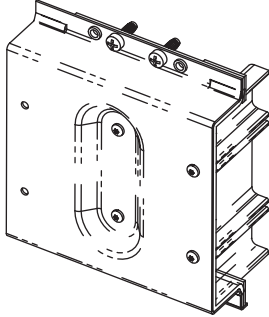
Cross



Catalog Number:
 225 A = PBCF[‡]225CR
 100 A = PBCF[‡]100CR

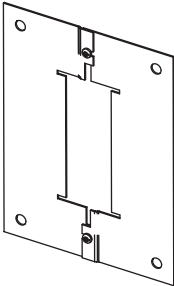
‡ To complete the catalog number, insert the configuration type from the “Busbar Configuration Table” on page

End Closure



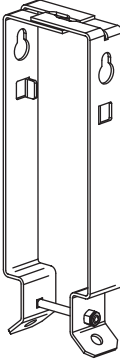
Catalog Number:
 225 A = PB225EC
 100 A = PB100EC

Wall Flange



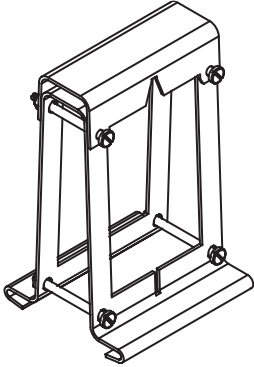
Catalog Number:
 225 A = PB225WF
 100 A = PB100WF

Drop Rod



Catalog Number:
 225 A = PB225FH
 100 A = PB100FH

Support Clamp



Catalog Number:
 PB225SC_
 (Suitable for 225 A and 100 A busway. Insert 4 or 6 for fastening clamp to 4-inch or 6-inch I-Beam)



POWERBUS™ 225

POWERBUS 225 Plug-In Units

5. POWERBUS™ 225 Plug-In Units

General Information

POWERBUS 225 plug-in units provide a safe, reliable, and easy-to-use method for tapping power off the busway exactly where it is needed. FA units are rated maximum of 100 A / 600 V, and QO/QOR units are rated 100 A / 240 V. All units are ingress/dust and water protected to IP-40. An optional kit can raise the level of protection to IP-54 on FA and QO units; the same kit raises a receptacle-type unit (QOR) to IPX3.

Ready-to-assemble (“enclosure only”) devices have provisions for field-mounting of a variety of FA or QO type circuit breakers and receptacles if required:

- Tap Box (Plug-In): For cabling power from busway
- FA Plug-In Unit: With provisions to accommodate field-installed FA circuit breakers
- QO Plug-In Unit: With provisions to accommodate field-installed QO circuit breakers
- QOR Plug-In Units: With provisions to accommodate field-installed QO circuit breakers plus receptacles

As a convenient option, Square D will factory-install the circuit breakers (and receptacles, if desired) into the enclosure and completely wire them so the units are ready for immediate installation onto the busway as soon as they arrive in the field.

Circuit Breakers

Circuit Breaker	Ampere Rating	Number of Poles
QO	10–100 ‡	1, 2, or 3
QOB		
QOGFI	15–60	
QOBGFI		
FA	15–100	3

‡ QO/QOB is 70 ampere maximum on single-pole circuit breakers

Receptacles

Receptacle	Ampere Rating	Number of Poles
Duplex—Commercial	10–30	1, 2, or 3
Duplex—Industrial		
Duplex—Isolated Ground		
Locking		
Locking—240 V		

IP Ratings

Plug-In Device	Standard Rating	Optional Rating
Tap Box	IP-54	Same
QOR	IP-40	IP-43 using optional kit, IP-54 using optional kit, and IP-54 rated receptacles and plugs
QOB	IP-40	
FA	IP-40	



Catalog Numbering System

Ready-to-Assemble Plug-In Unit Catalog Numbering System ‡

PB	P	QOR Type of Device	5A Plug-In Jaw Configuration	100 Maximum Amperage Rating	P43 IP Rating
PB = POWERBUS	P = Plug-In Device	QO = QO circuit breaker only QOR = QO circuit breaker and receptacle FA = FA circuit breaker TB = Tap Box	Refer to the "Busbar Configuration Table" below.	100	P43 = IP-43 P54 = IP-54

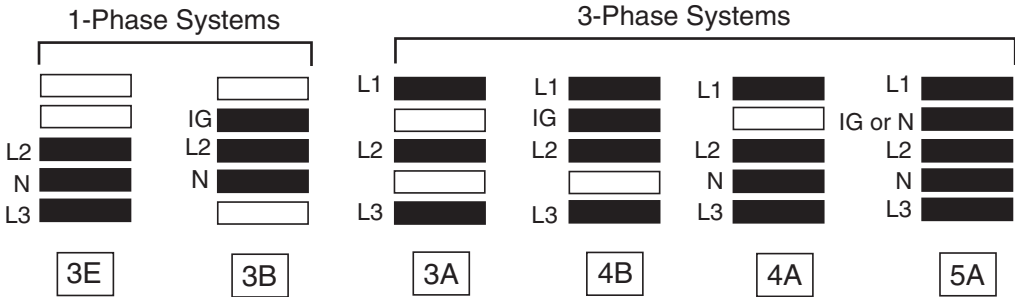
‡ Circuit breakers and receptacles provided by others

Factory-Assembled Plug-In Unit Catalog Numbering System ‡

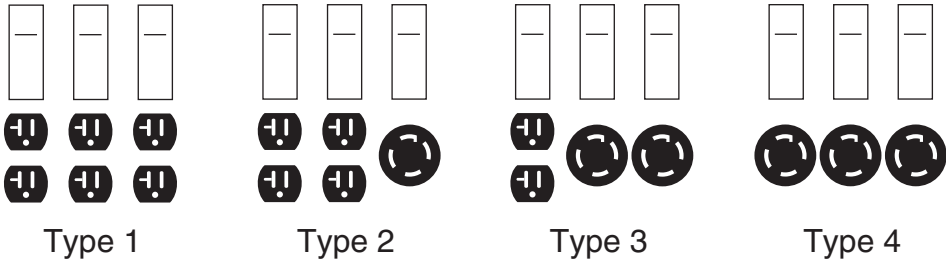
PB	P	QOR Type of Device	5A Plug-In Jaw Configuration	100 Maximum Amperage Rating	P40 IP Rating	M1 Receptacle Configuration	15B Circuit Breaker and Rating
PB = POWERBUS	P = Plug-In Device	QO = QO circuit breaker only QOR = QO circuit breaker and receptacle FA = FA circuit breaker TB = Tap Box	Refer to the "Busbar Configuration Table" below.	100	P40 = IP40 P54 = IP-54	Refer to the "Receptacle/Circuit Breaker Type Configuration" Table below and the "Plug-In Units (Factory-Assembled)" Tables on page 11.	15 = 15 Amp QO 15B = 15 Amp QOB 20 = 20 Amp QO 20B = 20 Amp QOB

‡ Circuit breakers and receptacles provided by others

Busbar Configuration Table



Receptacle/Circuit Breaker Type Configuration

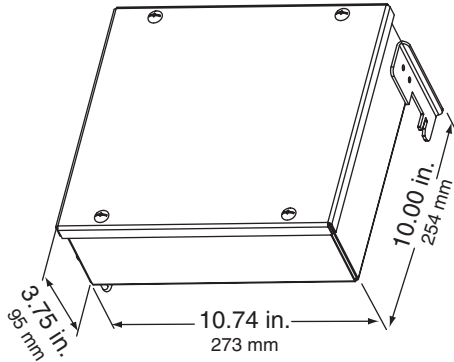


POWERBUS™ 225

POWERBUS 225 Plug-In Units

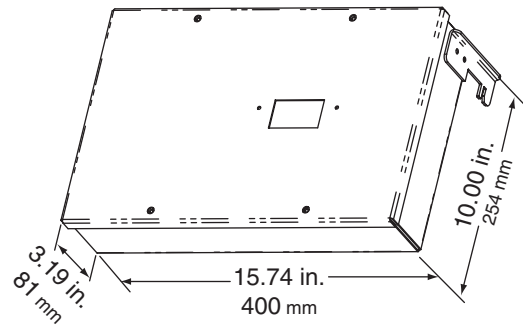
Plug-In Units (Ready-to-Assemble)

Tap Box (For Conduit-Cable)



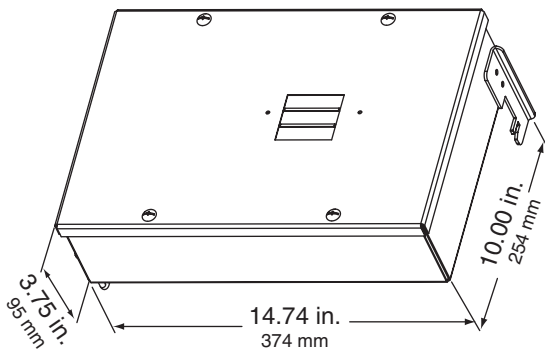
Busbar Configurations	Catalog Number
3E	PBP TB 3E 100
3B	PBP TB 3B 100
3A	PBP TB 3A 100
4B	PBP TB 4B 100
4A	PBP TB 4A 100
5A	PBP TB 5A 100

FA Unit (Provision for One 3-Phase FAP Breaker)



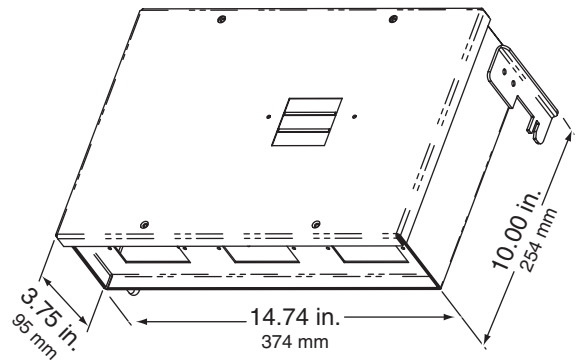
Busbar Configurations	Catalog Number
3E	3-phase systems only
3B	3-phase systems only
3A	PBP FA 3A 100
4B	PBP FA 4B 100
4A	PBP FA 4A 100
5A	PBP FA 5A 100

QO Unit (Provision for Three QO/QOB Breakers)



Busbar Configurations	Catalog Number
3E	PBP QO 3E 100
3B	PBP QO 3B 100
3A	PBP QO 3A 100
4B	PBP QO 4B 100
4A	PBP QO 4A 100
5A	PBP QO 5A 100

QOR Unit (Provision for Three QO/QOB Breakers and Three Receptacles)

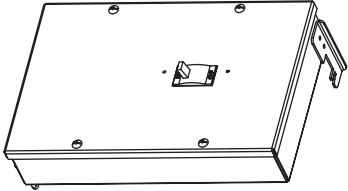


Busbar Configurations	Catalog Number
3E	PBP QOR 3E 100
3B	PBP QOR 3B 100
3A	PBP QOR 3A 100
4B	PBP QOR 4B 100
4A	PBP QOR 4A 100
5A	PBP QOR 5A 100

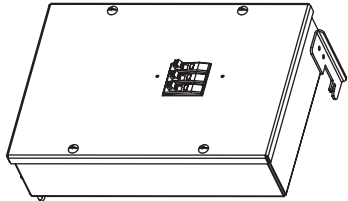
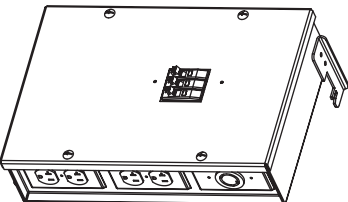
POWERBUS™ 225 POWERBUS 225 Plug-In Units

Plug-In Units (Factory-Assembled)

FA Unit with Circuit Breaker—600 V Maximum

FA Unit with Circuit Breaker 	Circuit Breaker Rating		Catalog Number			
	Rating	Type	3A Configuration	4B Configuration	4A Configuration	5A Configuration
	15		PBPFA3A100A015	PBPFA4B100A015	PBPFA4A100A015	PBPFA5A100A015
	20		PBPFA3A100A020	PBPFA4B100A020	PBPFA4A100A020	PBPFA5A100A020
	30		PBPFA3A100A030	PBPFA4B100A030	PBPFA4A100A030	PBPFA5A100A030
	40		PBPFA3A100A040	PBPFA4B100A040	PBPFA4A100A040	PBPFA5A100A040
	50		PBPFA3A100A050	PBPFA4B100A050	PBPFA4A100A050	PBPFA5A100A050
	60		PBPFA3A100A060	PBPFA4B100A060	PBPFA4A100A060	PBPFA5A100A060
	70		PBPFA3A100A070	PBPFA4B100A070	PBPFA4A100A070	PBPFA5A100A070
	80		PBPFA3A100A080	PBPFA4B100A080	PBPFA4A100A080	PBPFA5A100A080
	90		PBPFA3A100A090	PBPFA4B100A090	PBPFA4A100A090	PBPFA5A100A090
	100		PBPFA3A100A100	PBPFA4B100A100	PBPFA4A100A100	PBPFA5A100A100

QO/QOR Units with Circuit Breakers and Receptacles—120 V

QO Unit with Circuit Breaker 	Circuit Breaker		Catalog Number			
	Rating	Type	3E Configuration ‡	4A Configuration	5A Configuration	
Type 1—Three (3) Circuit Breakers Plus (3) Duplex Receptacles						
	15	QO	PBPQOR3E100M115	PBPQOR4A100M115	PBPQOR5A100M115	
	15	QOB	PBPQOR3E100M115B	PBPQOR4A100M115B	PBPQOR5A100M115B	
	20	QO	PBPQOR3E100M120	PBPQOR4A100M120	PBPQOR5A100M120	
	20	QOB	PBPQOR3E100M120B	PBPQOR4A100M120B	PBPQOR5A100M120B	
Type 2—Three (3) Circuit Breakers Plus (2) Duplex Receptacles and (1) Single Locking Receptacle						
	15	QO	PBPQOR3E100M215	PBPQOR4A100M215	PBPQOR5A100M215	
	15	QOB	PBPQOR3E100M215B	PBPQOR4A100M215B	PBPQOR5A100M215B	
	20	QO	PBPQOR3E100M220	PBPQOR4A100M220	PBPQOR5A100M220	
	20	QOB	PBPQOR3E100M220B	PBPQOR4A100M220B	PBPQOR5A100M220B	
QOR Unit with Circuit Breaker and Receptacles 	Type 3—Three (3) Circuit Breakers Plus (1) Duplex Receptacle and (2) Single Locking Receptacles					
		15	QO	PBPQOR3E100M315	PBPQOR4A100M315	PBPQOR5A100M315
		15	QOB	PBPQOR3E100M315B	PBPQOR4A100M315B	PBPQOR5A100M315B
		20	QO	PBPQOR3E100M320	PBPQOR4A100M320	PBPQOR5A100M320
	20	QOB	PBPQOR3E100M320B	PBPQOR4A100M320B	PBPQOR5A100M320B	
	Type 4—Three (3) Circuit Breakers and (3) Single Locking Receptacles					
	15	QO	PBPQOR3E100M415	PBPQOR4A100M415	PBPQOR5A100M415	
	15	QOB	PBPQOR3E100M415B	PBPQOR4A100M415B	PBPQOR5A100M415B	
	20	QO	PBPQOR3E100M420	PBPQOR4A100M420	PBPQOR5A100M420	
	20	QOB	PBPQOR3E100M420B	PBPQOR4A100M420B	PBPQOR5A100M420B	

‡ 3E Configuration includes two circuit breakers plus two receptacles (in left and center positions, as depicted in the receptacle type drawings at left). See Digest page 1-2 for QO circuit breaker information. Additional circuit breakers include QO-GFI, QO-HID, QO-K, and QO-EPD. Other factory-assembled units available using receptacles shown below. Consult your nearest Square D/Schneider Electric sales office.

Non-Locking Devices—Acceptable NEMA Receptacles

Wiring	Voltage	15 A	20 A
2-Pole, 2-Wire	120	1-15R	—
2-Pole, 2-Wire	240	—	2-20R
2-Pole, 3 Wire, Grounding	120	5-15R	5-20R
2-Pole, 3 Wire, Grounding	240	6-15R	6-20R
3-Pole, 3-Wire	120 / 240	—	10-20R
3-Pole, 3-Wire	3Ø 240	11-15R	11-20R
3-Pole, 3-Wire, Grounding	120 / 240	14-15R	14-20R
3-Pole, 3-Wire, Grounding	3Ø 240	15-15R	15-20R

Plug-in units have 1.82 in. x 2.82 in. (46 mm x 72 mm) openings for receptacle bodies and 3.28 in. (83 mm) spacing between #6-32 mounting holes

Locking Devices—Acceptable NEMA Receptacles

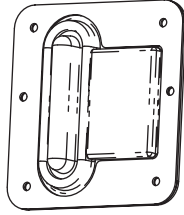
Wiring	Voltage	15 A	20 A	30 A
2-Pole, 2-Wire	120	L1-15R	—	—
2-Pole, 2-Wire	240	—	L2-20R	—
2-Pole, 3-Wire, Grounding	120	L5-15R	L5-20R	L5-30R
2-Pole, 3-Wire, Grounding	240	L6-15R	L6-20R	L6-30R
3-Pole, 3-Wire	120 / 240	—	L10-20R	L10-30R
3-Pole, 3-Wire	3Ø 240	L11-15R	L11-20R	L11-30R
3-Pole, 4-Wire, Grounding	120 / 240	—	L14-20R	L14-30R
3-Pole, 4-Wire, Grounding	3Ø 240	—	L15-20R	L15-30R
4-Pole, 4-Wire	3ØY 120/208	—	L18-20R	L18-30R
4-Pole, 5-Wire, Grounding	3ØY 120/208	—	L21-20R	L21-30R



POWERBUS™ 225
POWERBUS 225 Plug-In Units

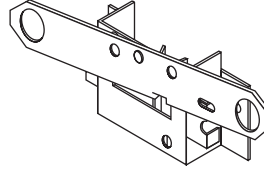
Plug-In Unit Accessories

IP-54 Kit



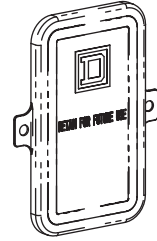
Catalog Number:
 FA Unit = PBP54100FA
 QO Unit = PBP54100QO

Floor Operator Attachment



Catalog Number:
 FA Unit = PBFO100FA
 QO Unit = PBFO100QO

Plug-In Opening Cover



Catalog Number:
 PBPIOCVR

Additional Accessories

Description	Catalog Number
Reverse Feed Label Kit	PBRFLKIT
Joint Compound	PJC7201
Hookstick 8 ft (2440 mm)	51568
Hookstick 14 ft (4265 mm)	515614



POWERBUS 225 Busway Suggested Specifications

1.0 GENERAL

1.1 Quality:

All busway products shall be manufactured in a facility which is Quality Systems Registered by Underwriters Laboratories® (UL®) to ISO9001.

1.2 Regulatory Requirements:

- a. All busway products shall be listed to Underwriters Laboratories Standard of Safety 857, which is jointly issued by UL (U.S.), CSA (Canada), and ANCE (Mexico).
- b. U.L. listing shall include mounting of the busway in any position without derating.
- c. Busway shall be constructed and installed in accordance with all applicable current sections of NEMA, ANSI, NOM, IEEE, and NFPA codes.

1.3 Storage, Handling, and Maintenance:

Refer to NEMA Publication BU1.1, which is a guide for proper installation, operation, and maintenance of busway products.

2.0 PRODUCTS

2.1 Manufacturers:

All busway shall be Square D POWERBUS™ 225 brand as manufactured by Schneider Electric.

2.2 Manufactured Units:

- a. Furnish and install a complete prefabricated plug-in busway power distribution system as shown on the plans.
- b. The approximate footage, fittings, plug-in units, and accessories are shown on the plans. The electrical contractor shall be responsible for routing the busway to coordinate with other trades. The contractor prior to ordering of the busway components shall make final field measurements.
- c. Plug-in busway shall be rated 225 Amp at 240 Volts or 100 Amp at 600 Volts and be of the configuration as required by application (single-phase, three-phase; with 100 percent or 200 percent neutral or without neutral; housing or isolated ground). Short-circuit ratings shall be 22,000 RMS symmetrical for 225 Amp busway or 14,000 RMS symmetrical for 100 Amp busway.

2.3 Busway Construction:

Housing:

- a. Busway shall be of the totally enclosed type for protection against mechanical damage and resistance to dust and water. Standard level of protection for the busway shall be to International Standards IP Protection Classification IP-54. Plug-In units shall be to Classification IP-40 with an optional kit available to provide an IP-54 rating. Plug-In units and Plug-in busway rated at IP-54 shall maintain this rating as a completely installed busway system.
- b. Housing material shall be natural finish electrical-grade extruded aluminum alloy 6063 for light weight and ease of handling in the field.
- c. Each plug-in opening accessible by the removal of a plastic cover which shall be retained for future use. Replacement covers shall be available as standard parts from the manufacturer.



POWERBUS™ 225

POWERBUS 225 Plug-In Units

Joints:

- a. Electrical connection shall be made at the joints by high-pressure spring type silver plated copper connectors. Mechanical connection shall utilize integral tie channels to fasten one section of busway to the next.
- b. All hardware required for joining sections shall be captive. Loose hardware will not be permitted.

Busbars:

- a. For maximum reliability and conductivity, all conductor bars shall be of silver plated alloy 110 copper.
- b. Busbars shall be firmly supported in the housing by molded insulators on alternate sides of the busway housing.
- c. Busbar insulators shall be of a type that isolates the jaws of a plug-in device from each other.

Plug-In Openings:

- a. Busway shall include a minimum of (10) plug-in openings for each 10 ft. length.
- b. All plug-in openings shall be usable simultaneously.
- c. Plug-in openings shall provide ingress protection to IP-2X standard.

2.4 Plug-In Units:

- a. Units shall be of the circuit breaker type with provisions for mounting and options for factory-installation of circuit breakers and related wiring devices.
- b. Plug-in units shall offer suitable means for hookstick operation.
- c. Units shall include a means of securely fastening the device to the busway housing with a bolted clamp.
- d. Plug-In unit short circuit rating should be 10K AIC or greater.
- e. Plug-In unit enclosures should be rated IP-40 as standard and have optional IP-54 capability.

2.5 Busway Support:

Hanger spacing shall not exceed 10 ft in length. Manufacturer's standard hangers shall be used whenever possible.



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