

Finger-safe power distribution blocks



Catalog symbol:

- PDBFS_

Description:

The small footprint, high Short-Circuit Current (SCCR) Bussmann® series power distribution blocks provide IP20* finger-safe protection under specified conditions. These UL® Listed, single-pole blocks are of a modular design that permits dovetailing together the required number of poles for an application and still meet the UL 1953 minimum 1" and 2" spacing required per UL 508A for feeder circuit applications and per NEC® for field installations.

With SCCR's up to 200 kA, these blocks help achieve compliance with National Electrical Code (NEC) and OSHA requirements by resolving a common SCCR "weak link" in industrial control panels.

To increase application flexibility, these blocks feature dual-wire rated ports that accept copper or aluminum conductors while retaining a UL Listed status.

With panel or 35 mm DIN-Rail** mounting for application flexibility these blocks are suitable for installation in wireways and industrial control panel feeder and branch circuits.

* See table on page 5.

** PDFFS504 panel mount only.

Catalog number example:

PDBFS204 is a 1-pole block

Where:

- The catalog symbol "PDBFS" defines the block as a finger-safe design.
- The catalog number ending "204" in this example defines this block's lineside and loadside characteristics covering the ampacity, number of ports and wire sizes, etc.
- See the catalog number table for details on the available lineside/loadside characteristics.

How to order:

From the catalog number table, select the catalog number that defines the desired lineside/loadside port and conductor characteristics.

Order one block per pole for the application.

Multiple single-pole blocks can be ganged together via the dovetailing feature to form multi-pole configurations.

Specifications:

Ratings

- Volts:
 - 600 V (UL)
 - 690 V (IEC)
 - 1000 V (self-certified)
- Amps: 175 to 760 A
- SCCR: Up to 200 kA (see table for circuit protection details)

Agency information

- UL 1953 Listed, Guide QPQS, File E256146
- CSA® Certified, Class 6228-01, File 47235
- CE
- RoHS compliant

Flammability rating

- UL 94 V0

Conductors†

- Stranded 75°C copper and aluminum
- Higher temperature rated conductors permitted with appropriate derating

† As specified in the catalog number table.

Features and benefits

- IP20 finger-safe under specified conditions increases safety by isolating energized connections.
- Wire-ready captive termination screws cannot be misplaced and are shipped “backed out” to save time on conductor installation.
- Sliding DIN-Rail latch provides easy block mounting.
- For multiple pole applications, all single-pole units can be gang mounted by using the interlocking dovetail pins that are pre-installed on the side of the blocks.
- Elongated panel-mounting holes provide greater flexibility and installation ease when matching up with drilled panel holes.

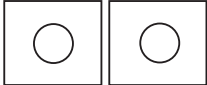
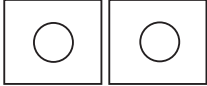
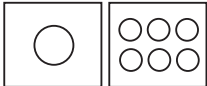
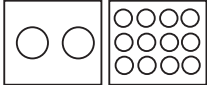
Dual wire port application

- Rated for dual wire port application to increase the possible number of lineside and loadside connections. E.g., PDBFS220 can accept two wires into the lineside port (#4 - #14 Cu, #4 - #8 Al) and two wires per port (eight connections total) on the loadside lug (#8 - #14 Cu, #8 Al).
- Dual wire applications are only viable when using two wires of the same size, stranding, and insulating and conductor material.

Ferrule terminal application

- Bussmann series PDBFS power distribution blocks are rated for use with UL Listed ferrules (see catalog number table for details).
- Ferrule applications allow for the use of a broader range of conductor stranding and simulate a more efficient, solid wire connection with the PDBFS terminal port.
- Always use UL Listed ferrules in accordance with the manufacturer’s specifications and instructions.

Catalog numbers:

Line/load port configuration	Current rating (A)	Lineside				Loadside					
		Wire size (Str/ferrule unless noted)*	Wires per port	Torque N•m (Lb-in)	Ports/pole	Wire size (Str/ferrule unless noted)*	Wires per port	Torque N•m (Lb-in)	Ports/pole	Max SCCR (kA)**	Catalog numbers
	175	2/0 - #1 Cu/Al (Str)	1			2/0 - #1 Cu/Al (Str)	1				
		#2 - #3 Cu/Al	1	12.4 (110) ^{††}		#2 - #3 Cu/Al	1	12.4 (110) ^{††}			
		#4 - #8 Cu/Al	1			#4 - #8 Cu/Al	1				
		#10 - #12 Al (Str)	1	4.0 (35)	1	#10 - #12 Al (Str)	1	4.0 (35)	1	200	PDBFS204
		#10 - #14 Cu	1			#10 - #14 Cu	1				
		#4 - #8 Cu/Al	2	13.6 (120)		#4 - #8 Cu/Al	2	13.6 (120)			
	175	2/0 - #1 Cu/Al (Str)	1			#4 - #6 Cu/Al (Str)	1	4.0 (35)			PDBFS220
		#2 - #3 Cu/Al	1	13.6 (120)	1	#8 Cu	1	2.8 (25)	4	200	
		#4 - #8 Cu/Al	1-2			#8 Al (Str)	1-2				
		#10 - #14 Cu	1-2			#10 - #14 Cu	1-2	2.3 (20)			
	310	350kcmil - 2/0 Cu/Al (Str)	1			350kcmil - 2/0 Cu/Al (Str)	1				PDBFS303
		1/0 Cu/Al (Str)	1-2	31.1 (275) [†]	1	1/0 Cu/Al (Str)	1-2	31.1 (275) [†]	1	200	
		#1 - #6 Cu/Al	1-2			#1 - #6 Cu/Al	1-2				
	380	500kcmil - 4/0 Cu/Al (Str)	1			#2 - #3 Cu/Al (Str)	1	5.6 (50)			PDBFS330
		3/0 - 1/0 Cu/Al (Str)	1-2	56.5 (500)	1	#4 Cu/Al	1	5.1 (45)	6	200	
		#1 - #6 Cu/Al	1-2			#6 Cu/Al	1-2	4.5 (40)			
						#8 Cu/Al	1-2	4.0 (35)			
	570	300kcmil - 2/0 Cu/Al (Str)	1			#4 - #6 Cu/Al (Str)	1	4.0 (35)			PDBFS377
		1/0 Cu/Al (Str)	1-2			#8 Cu	1	2.8 (25)	12	200	
		#1 - #2 Cu/Al	1-2	31.1 (275) [†]	2	#8 Al (Str)	1-2				
		#4 Cu/Al (Str)	1-2			#10 - #12 Al (Str)	1	2.3 (20)			
						#10 - #14 Cu	1-2				
	620	350kcmil - 2/0 Cu/Al (Str)	1			350kcmil - 2/0 Cu/Al (Str)	1				PDBFS500
		1/0 Cu/Al (Str)	1-2	31.1 (275) [†]	2	1/0 Cu/Al (Str)	1-2	31.1 (275) [†]	2	200	
		#1 - #4 Cu/Al	1-2			#1 - #4 Cu/Al	1-2				
		#6 Cu/Al	2			#6 Cu/Al	2				
	760	500kcmil - 4/0 Cu/Al (Str)	1			500kcmil - 4/0 Cu/Al (Str)	1				PDBFS504
		3/0 - 1/0 Cu/Al (Str)	1-2	56.5 (500)	2	3/0 - 1/0 Cu/Al (Str)	1-2	56.5 (500)	2	200	
		#1 - #6 Cu/Al	1-2			#1 - #6 Cu/Al	1-2				

* 75°C wire (higher temperature rated wire acceptable with appropriate derating). Using a ferrule on a stranded conductor requires a correctly sized UL Listed ferrule (customer supplied) applied according to the manufacturer’s specifications. Ferrule ratings apply to copper wire only.

** See pages 4 and 5 for the tested upstream overcurrent protective devices necessary for achieving these SCCRs.

† Torque rating for dual wire and ferrule application is 30.5 N•m (270 Lb-in).

†† Torque rating for ferrule application is 13.6 N•m (120 Lb-in).

Selecting SCCR power distribution blocks and terminal blocks

Short-circuit current rated power distribution blocks

Bussmann series power distribution blocks have three distinct styles to match different application needs. There are the PDBFS_ and PDB_ high short-circuit current rated power distribution blocks and the 16_ power terminal blocks. The differences are whether the power distribution blocks are enclosed or not, and whether they are UL 1953 Listed power distribution blocks or UL 1059 Recognized power terminal blocks, which have different minimum spacing requirements. The table on this page will assist you in selecting which block is right for your application.

Why these are important

Per the NEC and OSHA, equipment cannot be installed in an electrical system at a location where the available fault (short-circuit) current is greater than the equipment's SCCR.

Further, equipment SCCRs are required in the 2014 NEC and for UL 508A Listed control panels. Marking the equipment SCCR on control panels (NEC 409.110), industrial machinery electrical panels

(NEC 670.3(A)), and HVAC equipment (NEC 440.4(B)) is required by the NEC.

Power distribution and terminal blocks not marked with a component SCCR are typically one of the weakest links in a control panel's equipment SCCR and may limit the equipment SCCR to no more than 10 kA. The PDBFS_ and PDB_ products have the increased spacing required for use in feeder circuits of equipment listed to UL 508A (UL 1059 terminal blocks must be evaluated for proper spacings). Also, for building wiring systems, the PDBFS_ and PDB_ power distribution blocks can be used to meet the 2014 NEC requirements in section 376.56(B) for power distribution blocks in wireways.

See the last page of this data sheet for SCCR tools and resources to help you further understand and solve your SCCR needs.

Selection table

This table provides an overview of the three Bussmann series power distribution and terminal blocks mentioned above. For details on the PDB_ blocks, see data sheet number 10537. For the 16_ blocks, see data sheet numbers 10533 (UL Recognized power distribution blocks), 10534 (splicer blocks) and 10535 (stud blocks).

Catalog symbol	UL status	Enclosed	High SCCR*	Spacing ** 1" air, 2" surface	UL 508A panel branch circuit	UL 508A panel feeder circuit	HVAC UL 1995	Wireways NEC 376.56(B) (requires UL 1953)
PDBFS_	UL 1953 Listed power distribution blocks	Yes***	Yes	Yes	Yes	Yes	Yes	Yes
PDB_	UL 1953 Listed power distribution blocks	No†	Yes	Yes	Yes	Yes	Yes	Yes, with optional cover
16_	UL 1059 Recognized terminal blocks	No†	Yes	No††	Yes	No††	Yes	No

* When protected by proper fuse class with maximum ampere rating specified or smaller.

** For details, see PDB and TB minimum spacing requirements for equipment table below.

*** IP20 finger-safe under specific conditions, see data sheet page 5.

† Optional covers are available. Not IP20, but provide a safety benefit.

†† No, except: Yes, if single pole units installed with proper spacings.

Power distribution and terminal block minimum spacing requirements for equipment

UL standard	Spacing between live parts of opposite polarity		Spacing between live parts and grounded parts or enclosure @ 600 V
	Through air @ 600 V	Over surface @ 600 V	
508A feeder circuits	1"	2"	1"
508A branch circuits	3/8"	1/2"	1/2"
1995 HVAC	3/8"	1/2"	1/2"

Note: Refer to specific UL standards for complete spacing details.

Upstream fusing for SCCR and minimum enclosure data

This table contains the tested SCCR levels for each PDBFS power distribution block using the specified lineside and loadside conductors and Busmann series Class J, RK1, RK5 and T fuses. Using these tested SCCR levels also requires the power distribution block be installed in an enclosure with the minimum size indicated for each catalog number.

Catalog number	Conductors (AWG or kcmil)		Fuse class and maximum amps*					SCCR	Minimum enclosure size (in)
	Lineside	Loadside	J LPJ	RK1 LPN-RK (250 V) LPS-RK (600 V)	RK5 FRN-R (250 V) FRS-R (600 V)	T JJN (300 V) JJS (600 V)			
PDBFS204	2/0 - #8	2/0 - #8	200	100	60	200		200 kA	16 x 16 x 6.75
		#4 - #12	200	100	60	200		200 kA	
PDBFS220	2/0 - #8	#4 - #14	175	100	30	175		100 kA	16 x 16 x 6.75
			200	100	60	200		50 kA	
PDBFS303	350 - #6	350 - #6	400	200	100	400		200 kA	36 x 30 x 12.625
PDBFS330	500 - #6	#2 - #6	400	200	100	400		200 kA	24 x 20 x 6.75
		#6 - #14	200	100	60	200		50 kA	
PDBFS377	300 - #4	#4	175	100	30	175		100 kA	24 x 20 x 6.75
			600	400	200	600		200 kA	
PDBFS500	350 - #4	#4	400	200	100	400		100 kA	36 x 30 x 12.625
		#4 - #14	200	100	60	200		50 kA	
PDBFS504	500 - #6	#4	600	400	200	600		50 kA	36 x 30 x 12.625
			400	200	100	400		100 kA	

Ampacities 75°C per NEC® Table 310.16 and UL 508A Table 28.1.

* Class G 60 A (SC-60) or less or Class CC 30 A (LP-CC-30, FNO-R-30, KTK-R-30) or less are suitable for all SCCRs in this table.

** Class L 800 A (KRP-C 800_SP) or less fuses suitable for this particular SCCR case.

Upstream circuit breakers for SCCR and minimum enclosure data

This table contains the tested SCCR levels for each PDBFS power distribution block using the specified lineside and loadside conductors and Eaton and General Electric circuit breakers. Using these tested SCCR levels also requires the power distribution block be installed in an enclosure with the minimum size indicated for each catalog number.

PDBFS SCCR as rated with Eaton circuit breakers

Catalog no.	Suitable copper conductors kcmil/AWG		SCCR, RMS Sym, kA	Volts max	Overcurrent protection circuit breaker required		Minimum enclosure size (in.)
	Line	Load			Type	Max amp	
PDBFS204	2/0 - #8	2/0 - #8	65	480	EGC125, E125C, EGH125, E125H	125	16 x 16 x 6.75
PDBFS330	500 - #3	#2 - #8	14	480	LGH400, L400H, LGE400, L400E, LGS400, L400S	400	24 x 20 x 6.75
			25		LGC400, L400C, LGU400, L400U, LGX400, L400X		
PDBFS377	(2) 300 - #2	#4	30	480	LGH600, L600H, LGE600, L600E, LGS600, L600S	600	24 x 20 x 6.75
		#6	18				
		#8	14				
		#4	42				
		#6	35				
		#8	14		LGC600, L600C, LGU600, L600U, LGX600, L600X		

PDBFS SCCR as rated with General Electric circuit breakers

Catalog no.	Suitable copper conductors kcmil/AWG		SCCR, RMS Sym, kA	Volts max	Overcurrent protection circuit breaker required		Minimum enclosure size (in.)
	Lineside	Loadside			Type	Max amp	
PDBFS204	2/0 - #8	2/0 - #8	65	480	SELA	150	16 x 16 x 6.75
			25		SEHA	150	
PDBFS220	2/0 - #8	#4 - #12	65	480	SELA	150	16 x 16 x 6.75
			25		SEHA	150	
PDBFS303	250 - #6	350 - #6	65	480	SFLA	250	24 x 20 x 6.75
		250 - #6	35		SFHA	250	
	3/0 - #6	350 - #6	65		SELA	150	
			25		SEHA	150	
PDBFS330	250 - #6	#2 - #12	65	480	SFLA	250	24 x 20 x 6.75
			35		SFHA	250	
	3/0 - #6		65		SELA	150	
			25		SEHA	150	

Specified installation conditions for IP20 finger-safe ratings

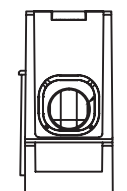
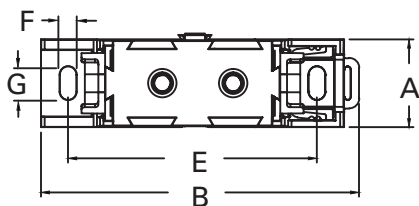
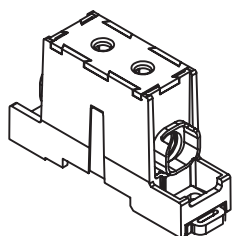
This table contains the installed wire and trim lengths, and other conditions the PDBFS power distribution blocks need in order to be compliant with IP20 specifications. IP20 compliance status is indicated in the lineside and loadside wire port and terminal screw opening columns.

Catalog No.	Lineside		Loadside					
	Installed wire/state	Wire trim length - in (mm)	IP20 status		Installed wire/state	Wire trim length - in (mm)	IP20 status	
			Wire port opening	Terminal screw opening			Wire port opening	Terminal screw opening
PDBFS204	2/0 - #8	0.85 (22)	Yes	Yes	2/0 - #8	0.97 (25)	Yes	Yes
PDBFS220	2/0 - #8	0.75 (19)	Yes	Yes	#4 - #14	Top row 0.55 (14), Bottom row 0.85 (22)	Yes	Yes
					Screws fully opened		N/A	Yes
					No wire in hole		No	N/A
PDBFS303	350kcmil - 2/0	1.35 (34)	Yes	Yes	350kcmil - 2/0	1.25 (32)	Yes	Yes
	1/0 - #6		No	Yes	1/0 - #6		No	Yes
PDBFS330	500 - 250kcmil	1.25 (32)	Yes	Yes	#2 - #14	Top row 0.59 (15), Bottom row 1.2 (30)	Yes	Yes
	4/0 - #6		No	Yes	Screws fully opened		N/A	Yes
							No wire in hole	Yes
PDBFS377	300kcmil - 4/0	Top row 1.15 (29) bottom row 1.4 (36)	Yes	Yes	#4 - #14	Top row 0.55 (14), Middle row 1.00 (35), Bottom row 1.22 (31)	Yes	Yes
	3/0 - #4		No	Yes	Screws fully open		N/A	Yes
	Screws fully open		N/A	No	No wire in port		Yes	N/A
	No wire in port		No	N/A				
PDBFS500	350kcmil - 2/0	1.25 (32)	No	Yes	350kcmil - 2/0	1.25 (32)	Yes	Yes
	1/0 - #4		No	Yes	1/0 - #4		No	Yes
	Screws fully opened		N/A	No	Screws fully open		N/A	No
	No wire in port		No	N/A	No wire in port		No	N/A
PDBFS504	500 - 350kcmil	1.25 (32)	Yes	Yes	500 - 350kcmil	1.25 (32)	Yes	Yes
	300 - #6		No	Yes	300 - #6		No	Yes
	Screws fully open		N/A	No	Screws fully opened		N/A	No
	No wire in port		No	N/A	No wire in port		No	N/A

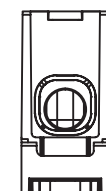
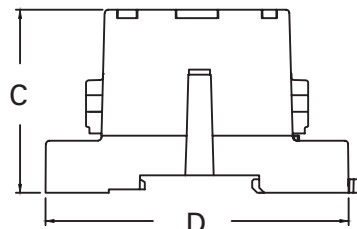
Dimensions — in (mm)

Catalog No.	Width A	Length B	Height C	D	E	F	G	H
PDBFS204	1.03 (26)	3.73 (95)	2.15 (54)	3.55 (90)	2.92 (74)	0.20 (5)	0.40 (10)	N/A
PDBFS220	1.03 (26)	3.73 (95)	2.15 (54)	3.55 (90)	2.92 (74)	0.20 (5)	0.40 (10)	N/A
PDBFS303	1.54 (39)	4.66 (118)	2.87 (73)	4.49 (114)	3.82 (97)	0.20 (5)	0.44 (11)	N/A
PDBFS330	1.54 (39)	4.66 (118)	2.87 (73)	4.49 (114)	3.82 (97)	0.20 (5)	0.44 (11)	N/A
PDBFS377	1.88 (47)	4.66 (118)	2.93 (74)	4.49 (114)	3.82 (97)	0.20 (5)	0.44 (11)	N/A
PDBFS500	2.37 (60)	4.66 (118)	2.60 (66)	4.49 (114)	3.82 (97)	0.20 (5)	0.44 (11)	N/A
PDBFS504	2.54 (64)	4.49 (114)	3.15 (80)	—	3.82 (97)	0.20 (5)	0.35 (9)	1.81 (46)

PDBFS204

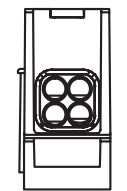
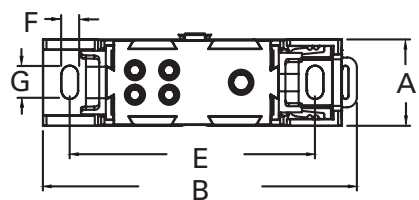
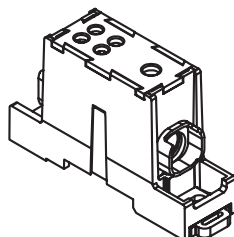


Loadside

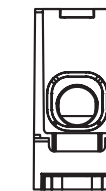
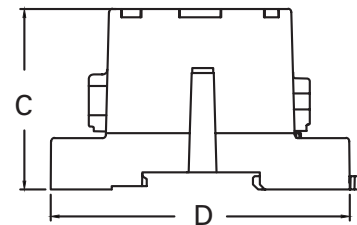


Lineside

PDBFS220

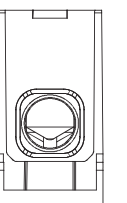
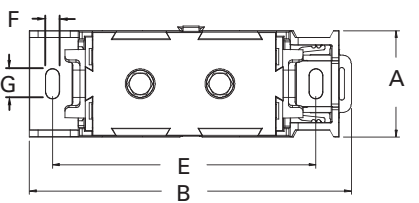
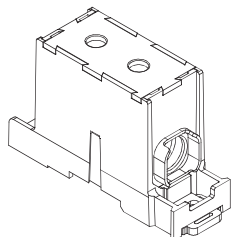


Loadside

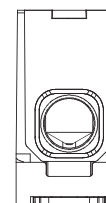
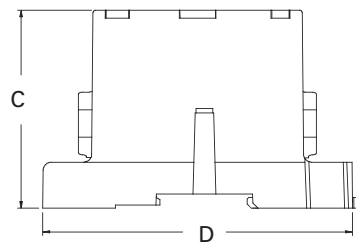


Lineside

PDBFS303

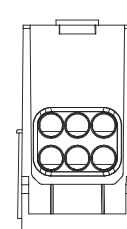
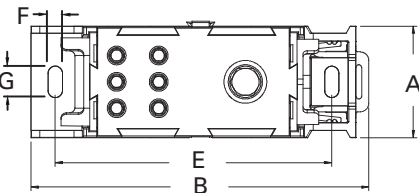
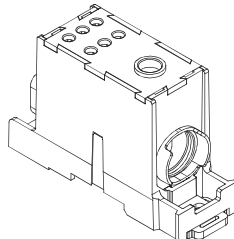


Loadside

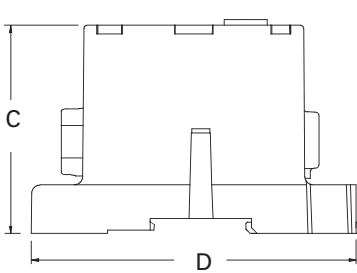


Lineside

PDBFS330

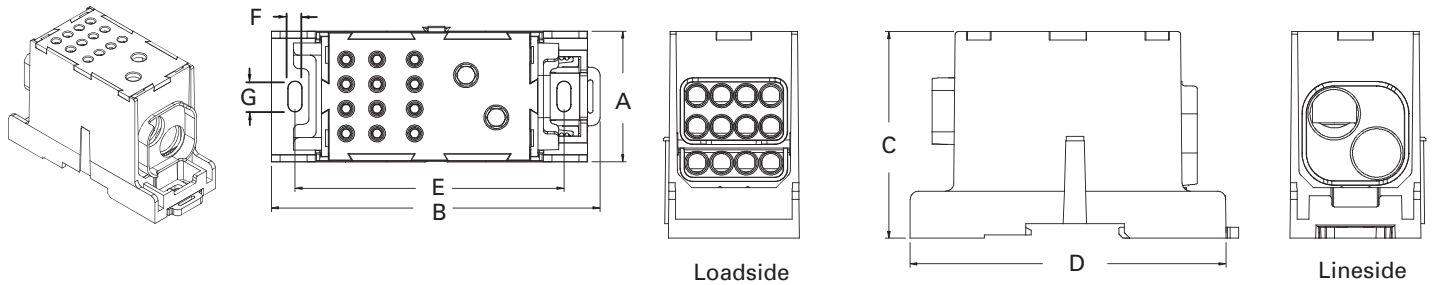


Loadside

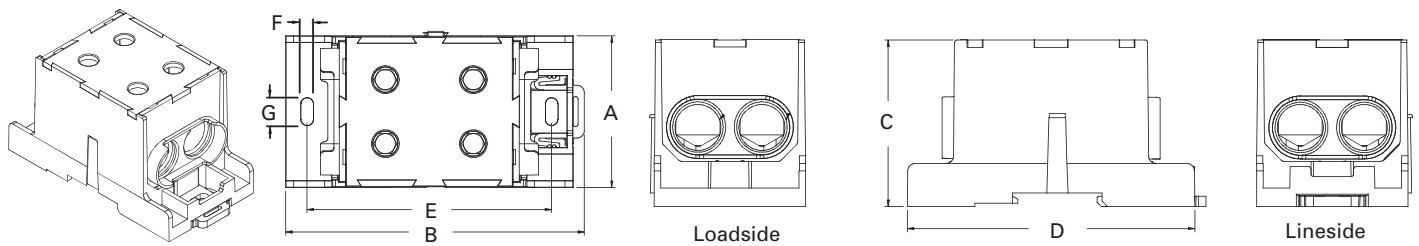


Lineside

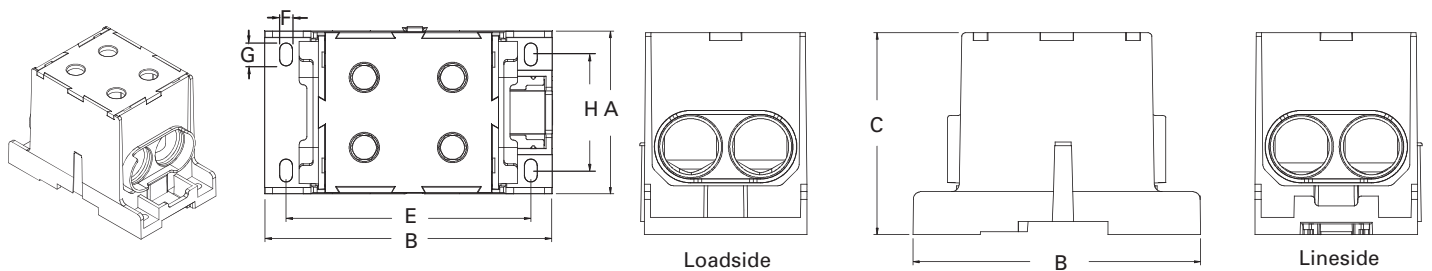
PDBFS377



PDBFS500



PDBFS504



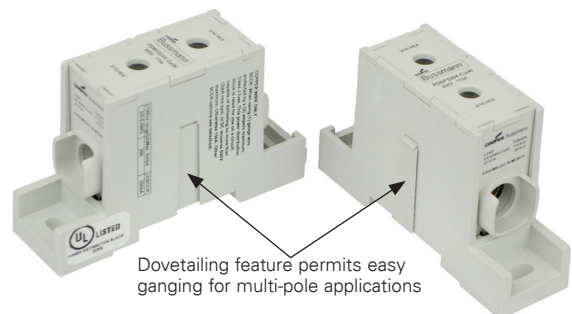
Multi-pole block ganging

PDBFS power distribution blocks are single-pole devices that can be ganged for the required number of poles using the interlocking dovetail pins that are pre-installed on each block.

To interlock and gang two or more blocks (DIN-Rail or panel mount):

- Place blocks of the same catalog number side-by-side and slide the dovetail pin of one block into the reciprocal slot on the other and press together until fully seated and the backs of both blocks are coplanar.
- Repeat the step above until the number of desired poles are ganged

Note: Dissimilar PDBFS blocks can be ganged together. E.g., a PDBFS204 can be ganged with a PDBFS220 using the interlocking dovetailing pins. Ganging a PDBFS504 with any other PDBFS will prevent DIN-Rail mounting.



DIN-Rail mounting

All versions of the Bussmann series PDBFS power distribution blocks can be DIN-Rail mounted except for the PDBFS504, which can only be panel mounted.

It is recommended for multi-pole applications that the individual blocks be ganged using the included dovetailing feature. See Multi-pole block ganging for details.

To mount, perform the following:

- Using an appropriate size flat blade screw driver, open the DIN-Rail latch that is on the lineside of each block.
- Hook the loadside DIN-Rail tabs onto the lower edge of the 35 mm DIN-Rail
- Rotate the block(s) up until they are seated over the upper and lower edges of the DIN-Rail
- Push the DIN-Rail latch(es) down and into the locked position.

To remove blocks, reverse the previous steps)

Note: To prevent damage to the block housing when torquing the terminal screws, DIN-Rail end stops are required on each side of the block or ganged blocks.

The recommended Bussmann series DIN-Rail end stops are:

Catalog no.	Description
BRKT-ND	Snap-on DIN-Rail end stop with friction anchor
BRKT-NDSCRW2	DIN-Rail end stop with screw-clamp anchor

Panel mounting

All Bussmann series PDBFS power distribution blocks can be panel mounted. It is recommended for multi-pole applications that the individual blocks be ganged using the included dovetailing feature. See Multi-pole block ganging for details.

Use two (2) suitable length #10 or M5 screws for each block being mounted. Use four (4) screws for each PDBFS504 block.

SCCR tools and resources

Eaton offers many resources that help customers understand and assess their SCCR needs.

Please use the following whenever you have questions, concerns or just need help with SCCR ratings.

Engineering services for SCCR

OSCAR™ compliance software eliminates the guesswork in equipment SCCR calculations.

This innovative OSCAR compliance software assists customer compliance with new Code and standards requirements for short-circuit current ratings as they relate to control panels, equipment and assemblies. Go to **OSCAR.eaton.com** and request a seven-day free trial.

If your equipment SCCR needs improvement, contact the Bussmann Application Engineers for a free design review. Call toll-free 1-855-BUSSMANN (855-287-7626) or email **FuseTech@eaton.com**.

Online SCCR tools and publications

- Free SCCR Protection Suite online tool. An easy, fast way to search for components and their SCCR. Visit **sccr.eaton.com**.
- Application notes:
 - Developing an effective SCCR plan for facilities and purchasers of industrial equipment — publication no. 10367
 - Developing an equipment SCCR standard for manufacturers of industrial equipment — publication no. 10368
 - Four steps to determine equipment SCCR — publication no. 10538
- Equipment SCCR made easy brochure — publication no. 10374
- SPD (Selecting Protective Devices) handbook; over 250 pages covering the application of overcurrent protective devices, SCCR and more — publication no. 3002

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