SBE®320 / SBX®350 Connectors - up to 350 Amps



SBX® and SBE® connectors can integrate up to 8 auxiliary power / signal contacts along with the two primary power circuits. Sequencing within auxiliary positions is possible using the 4 pin lengths available in the 1x4 auxiliary connector. The SBE® touch safety rating is equivalent to that of the SBS® connector line.

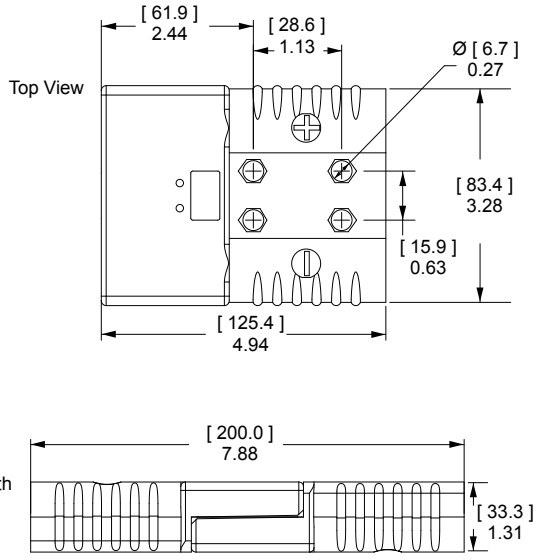
- **Silver Plated Wire Contacts up to 300 mcm (152 mm²)**
  Allows low resistance UL rated currents up to 350 amps per pole
- **Up to 8 Last-mate / First-break Auxiliary's**
  Enables intelligent power switching, CAN and interlock loop circuitry, as well as power up to 20 amps per pole
- **Durable Housings and Contacts**
  Like all Multipole connectors, the silver plated power contacts are rated up to 10,000 mating cycles

| SBE®320 / SBX®350 ORDERING INFORMATION |

SBE®320 / SBX®350 Housings

The largest size of SBE®, X, O style housing. SBE® housings are molded from a chemical resistant PBT. SBX® housings are molded from PC. SBE®320 and SBX®350 housings of the same Voltage Color Code cannot be mated. SBX®350 housings do not meet EN1175-1 requirements for industrial trucks.

Description	Voltage Color Code	- SBE®320 Part Numbers -		- SBX®350 Part Numbers -	
Minimum Quantity		100	25	100	25 .....
Yellow	12V	2-8171G6	E6362	2-7249G6	6362
Orange	18V	2-8171G7	E6339	2-7249G7	6339
Red	24V	2-8171G3	E6352	2-7249G3	6352
Gray	36V	2-8171G1	E6350	2-7249G1	6350
Blue	48V	2-8171G2	E6351	2-7249G2	6351
Green	72V	2-8171G4	E6353	2-7249G4	6353
Black	80V	2-8171G5	E6361	2-7249G5	6361
Brown	96V	2-8171G8	E6336	N/A	N/A
Purple	120V	2-8171G9	E6349	N/A	N/A

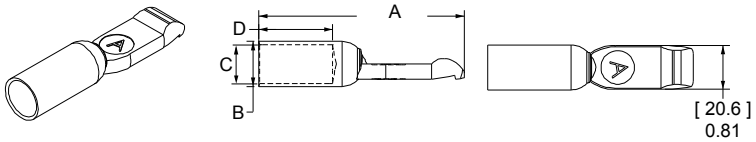


SBE®320 / SBX®350 Silver Plated Primary Power Wire Contacts

Silver plated contacts offer superior electrical performance and durability up to 10,000 mating cycles. See reducing bushings in accessory section for smaller wires.

AWG	mm²	- Loose Piece Part Numbers -			Dimensions - A - inches	mm	- B - inches	mm	- C - inches	mm	- D - inches	mm
Minimum Quantity		200	150	50	.....							
300 mcm	150	-	6358-BK	6358 *	3.03	76.96	0.88	22.35	0.75	19.05	0.88	22.35
4/0	120	6356-BK	-	6356 *	3.10	78.74	0.75	19.05	0.64	16.26	0.81	20.57
3/0	95	6355-BK	-	6355 *	3.10	78.74	0.70	17.78	0.58	14.73	0.81	20.57
2/0	70	6354-BK	-	6354 *	3.10	78.74	0.64	16.26	0.49	12.45	0.81	20.57
2	35	6394-BK	-	6394 *	3.03	76.96	0.51	12.95	0.38	9.65	0.81	20.57

* Sold as pairs. 2 parts shipped for every 1 part ordered.



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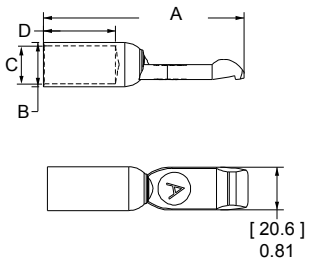
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SBE®320 DIN Standard Silver Plated Primary Power Wire Contacts

Crimp barrel O.D. are compliant with DIN standard tooling. Will also fit into SBX®350 housings. Not recommended for cross mating with above typical contacts for SBE® & SBX®.

AWG	mm²	Loose Piece ----- Part Numbers -----		Dimensions - A - inches	mm	- B - inches	mm	- C - inches	mm	- D - inches	mm
Minimum Quantity ...		200	50								
3/0	95	1341G3-BK	1341G3 *	2.89	73.41	0.78	19.81	0.59	14.99	0.94	23.88
2/0	70	1341G2-BK	1341G2 *	2.74	69.60	0.68	17.27	0.51	12.95	0.79	20.07
1/0	50	1341G1-BK	1341G1 *	2.65	67.31	0.57	14.48	0.43	10.92	0.79	20.07

* Sold as pairs. 2 parts shipped for every 1 part ordered.



| SBE®320 / SBX®350 CONNECTOR SPECIFICATIONS |

Electrical

Current Rating Amperes[1]	SBX350	SBE320
Primary Power (300 mcm)	350	320
Powerpole® Auxiliary (12 AWG)	20	20
1x4 Auxiliary (12 AWG)	20	20
PPMX Auxiliary (20 AWG)	7 UL	5 CSA
Voltage Rating AC/DC	**UL 1977**	**EN1175-1**
Primary Power	600	150[4]
Powerpole® Auxiliary	600	150[4]
1x4 Auxiliary	200	
PPMX Auxiliary	300	
Dielectric Withstanding Voltage Primary Power		
Volts AC	2,200	
Avg. Mated Contact Resistance Milliohms[1]		
2 1/2" of 300mcm wire	0.050	
UL Hot Plug Current Rating Amperes - 250 cycles at 120V DC		
Power	100A	
Powerpole® Auxiliary	30A	
1x4 Auxiliary	5A	

Materials

Housing	
SBX® and Powerpole® Plastic Resin	Polycarbonate
SBE® and 1x4 Auxiliary Housing	Polycarbonate / PBT blend
Contact Retention Spring	Stainless Steel
Housing Flammability Rating	
UL94	V-0
Power & Powerpole® Contact	Silver Plated Copper Alloy
1x4 Auxiliary Contacts	
Pin	Copper alloy, Au over Ni
Socket	BeCu, Au over Ni
Socket Body	Copper alloy, Sn bright over Ni
Retention Clip	Stainless Steel
PPMX Contacts	Gold Plated Copper Alloy
Contact Termination Methods	
Crimp[3]	
Hand Solder	

Mechanical

Wire Size Range	AWG	mm²
Power Contacts	1/0 to 300 mcm	53.5 to 152
Auxiliary Contacts	24 to 10	0.25 to 5.3
Max. Wire Insulation Diameter	**in.**	**mm**
Power Contacts	0.440	11.200
Powerpole® Auxiliary	0.175	4.450
1x4 Auxiliary	0.140	3.600
Operating Temperature[2]	**°F**	**°C**
SBX and SBE Housings	-4° to 221°	-20° to 105°
Mating Cycles No Load by Plating	**Silver (Ag)**	**Gold (Au)**
Power Contacts	10,000	
Powerpole® Auxiliary	10,000	
1x4 Auxiliary		10,000
PPMX Auxiliary		5,000
Avg. Mating / Unmating Force	**Lbf.**	**N**
Main Connnector Housing	55	245
Per Powerpole®	5.00	22.00
Per Contact in 1x4 Auxiliary	0.70	3.00
Per PPMX Housing	4.50	20.00
Min. Contact / Spring Retention Force	**Lbf.**	**N**
Power Standard Housing	150	667.2
Powerpole® Housing	25	111
1x4 Auxiliary Housing	10	44.5
PPMX Housing	12	53

Protection

Touch Safety Main Connector Housing		
IEC 60950	SBE®320 Only	Pass
IEC 60529	SBE®320 & SBX®350	IP20

[1] Based on: 105°C rated or better cable of the largest size, Properly calibrated APP® recommended tooling, and a 25°C ambient temperature. UL rating not to exceed the maximum operating temperature. CSA rating below a 30°C temperature rise.

[2] Limited by the thermal properties of the connector plastic housing.

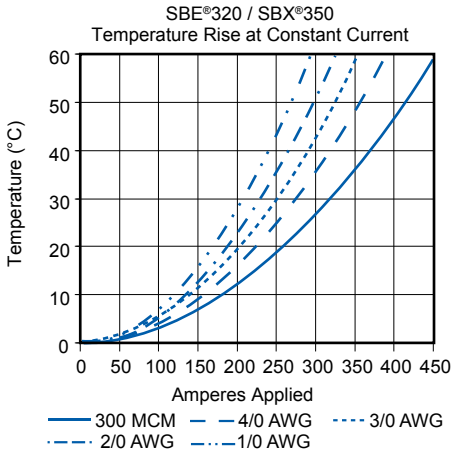
[3] Use APP® recommended tooling only. Alternate tools may adversely affect the performance of our connectors along with UL and CSA recognition.

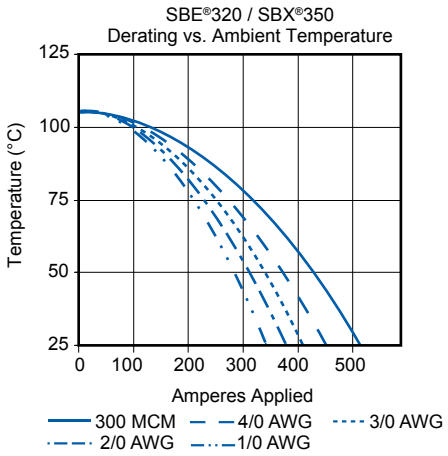
[4] Voltage capability of SBE® housings is identical to SBX®, but derated to meet EN1175-1 requirements.

c UL us File No. E26226 © CSA Certified File No. LR25154

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| SBE®320 / SBX®350 CONNECTOR TEMPERATURE CHARTS|





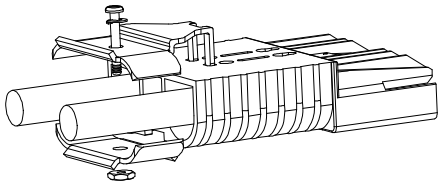
| SBE®320 / SBX®350 Accessories |

Cable Clamps

Durable metal clamps adapt to a wide range of cable sizes. Cable clamp kit includes Clamp Top and Bottom as well as the Hardware Bag.

Description	Cable Size Min / Max Inches O.D.	Min / Max mm O.D.	- Part Number -
Minimum Quantity			25
Cable Clamp Kit	0.85 to 0.67	21.6 to 17.1	911G2

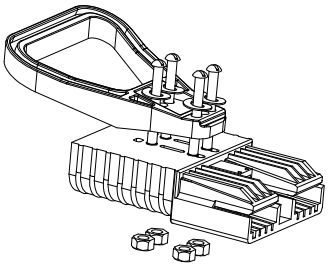
The given wire O.D. information is an estimate. Cable clamps should be evaluated for performance with the actual wire to be used.



Handles

Handles are made out of durable PC plastic. Hardware to attach to connector body included in kits.

Description	----- Part Numbers ------	
Minimum Quantity	100	25
Gray Handle Kit	995G2-APP	995G2
Red Handle Kit	995G4-APP	995G4
Handle Only, Gray	3-5074P1	-
Handle Only, Red	3-5074P3	-
Handle Only, Black	3-5074P5	-
Hardware Bag	-	106G7

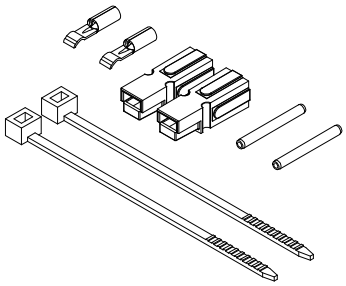


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Powerpole® Auxiliary

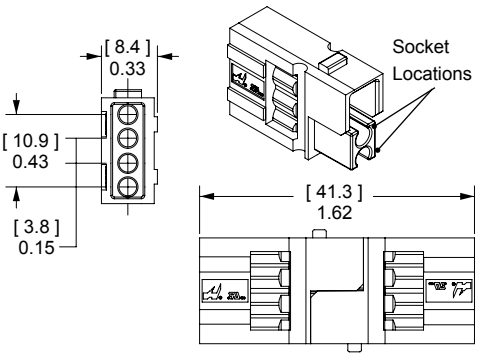
Powerpole® auxiliary connectors are rated up to 30 amps 600 volts and can be used for auxiliary power, control or sensing. The auxiliary kit includes (1) each black and red Standard Powerpole® housing, (2) contacts, (2) zip cable straps, and (2) retaining pins. (1) Retaining clip can be substituted for (2) retaining pins.



Description	---- Part Numbers ----	
Minimum Quantity	200	25 ...
Powerpole® Auxiliary Kit #16 to #12 Contact	-	6305G1
Powerpole® Auxiliary Kit #20 to #16 Contact	-	6310G1
Black Powerpole® Housing	1327G6	-
Red Powerpole® Housing	1327	-
#16 to #12 Contact	1331	-
#20 to #16 Contact	1332	-

1x4 Auxiliary Connector

APP®'s unique 1x4 auxiliary connector allows up to 4 auxiliary circuits up to 20 amps 150 volts each in SBE®, SBO®, & SBX® housings. The genderless design holds two each of the gold plated pin & socket contacts. This innovation allows the very durable and cost effective design of SBE®,O,X connectors to substitute for DIN 43589-1 applications where 4 auxiliary contacts are required. Multiple pin lengths allow the further benefit of sequencing between circuits. (2) Retaining pins or (1) Retaining clip is required to hold the auxiliary housing in place. Auxiliary Kits include (1) Auxiliary Housing, (2) Standard Length Pin Contacts, (2) Socket Contacts, (2) Retaining Pins and (1) Retaining Clip.

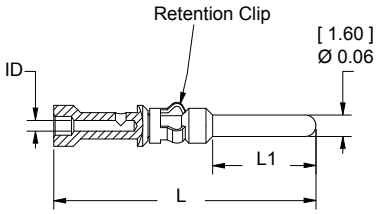


Description	AWG	mm²	---------- Part Numbers ----------		
Minimum Quantity			1,000	250	25 ....
1x4 Auxiliary Kit	12	4	-	-	440G3
1x4 Auxiliary Kit	16 to 14	1.5 to 2.5	-	-	440G1
1x4 Auxiliary Kit	20 to 16	0.75 to 1.5	-	-	440G2
1x4 Auxiliary Housing	Contacts Sold Seperately		3-5956P1	444G1	-

Pin Contacts for 1x4 Auxiliary Connector

Gold plated contacts are available in 4 lengths to allow sequencing of circuits.

Description	AWG	mm²	---------- Part Numbers ----------	
Minimum Quantity			500	50 .....
Standard Length 7.7mm	12	2.5	PM16P12S30	PM16P12S30-50
	16 to 14	1.0 to 1.5	PM16P1416S30	PM16P1416S30-50
	20 to 16	0.75 to 1.0	PM16P1620S30	PM16P1620S30-50
	24 to 20	0.50 to 0.75	PM16P2024S30	PM16P2024S30-50
Pre-Mate 9.3mm	12	2.5	PM16P12A30	PM16P12A30-50
	16 to 14	1.0 to 1.5	PM16P1416A30	PM16P1416A30-50
	20 to 16	0.75 to 1.0	PM16P1620A30	PM16P1620A30-50
	24 to 20	0.50 to 0.75	PM16P2024A30	PM16P2024A30-50
Post-Mate 6.4mm	12	2.5	PM16P12C30	PM16P12C30-50
	16 to 14	1.0 to 1.5	PM16P1416C30	PM16P1416C30-50
	20 to 16	0.75 to 1.0	PM16P1620C30	PM16P1620C30-50
	24 to 20	0.50 to 0.75	PM16P2024C30	PM16P2024C30-50

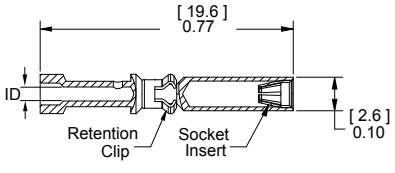


Auxiliary Pin Contact Lengths	- L -		- L1 -	
	in.	mm	in.	mm
Standard Length 7.7mm	0.77	19.6	0.30	7.7
Pre-Mate 9.3mm	0.83	21.2	0.37	9.3
Post-Mate 6.4mm	0.72	18.3	0.25	6.4

Socket Contacts for 1x4 Auxiliary Connector

Selectively gold plated contacts offer low resistance and durability up to 10,000 mating cycles.

Description	AWG	mm²	---------- Part Numbers ----------	
Minimum Quantity			500	50 .....
Socket Contact	12	2.5	PM16S12S32	PM16S12S32-50
	16 to 14	1.0 to 1.5	PM16S1416S32	PM16S1416S32-50
	20 to 16	0.75 to 1.0	PM16S1620S32	PM16S1620S32-50
	24 to 20	0.50 to 0.75	PM16S2024S32	PM16S2024S32-50

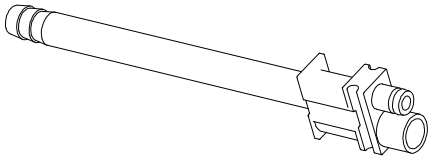


Auxiliary Socket Contacts Crimp Barrel ID		
Wire Gauge	in.	mm.
#24 / 20	0.04	1.1
#20 / 16	0.07	1.7
#16 / 14	0.08	2.1
#12	0.10	2.6

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SBE® Air Tubes

Air tubes fit into SBE® housings to allow electrolyte circulation while charging the battery. Genderless tube design allows the same part to be used on both sides. (2) Retaining pins or (1) Retaining clip is required to hold the air tube in place. Retaining pins are included in Air Tube Kit.

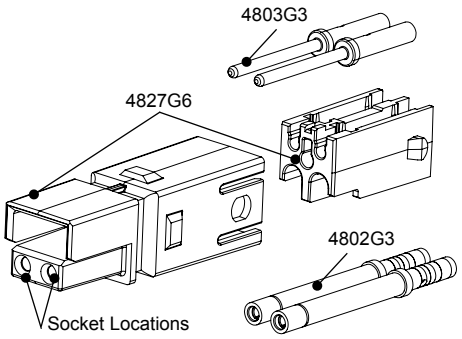


Description	---- Part Numbers ----	
Minimum Quantity	500	25 ...
Air Tube Kit, Black	-	6396G1
Air Tube Only	3-5798P1	-

NEW PPMX Auxiliary Connector

The PPMX auxiliary connector allows up to 8 auxiliary circuits to be used in the SBE®, SBO®, & SBX® housings. There are 4 auxiliary circuits per PPMX connector and two PPMX housings fit into the auxiliary port in the main connector housing. Rated up to 7 amps 300 volts per contact, the genderless design holds two each gold plated pin & socket contacts. This innovation allows the very durable and cost effective design of SBE®, O, X connectors to be used for applications requiring up to 8 battery monitoring or equipment vehicle communication circuits. (2) Retaining pins or (1) Retaining clip is required to hold the auxiliary housing in place.

Auxiliary Kits includes: (1) Auxiliary Housing, (2) Pin Contacts, and (2) Socket Contacts.



Description	AWG	mm²	---------- Part Numbers ----------		
Minimum Quantity			1,000	100	25 .....
PPMX Auxiliary Kit	24 to 20	0.50 to 0.25	-	4850G6	-
1x4 Auxiliary Housing	Contacts Sold Seperately		4827G6-BK	-	4827G6

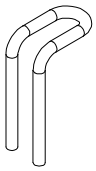
NEW Pin & Socket Contacts for PPMX Auxiliary Connector

Gold plated contacts are ideal for signal or low power use with durability up to 5,000 mating cycles.

Description	AWG	mm²	------ Part Numbers ------	
Minimum Quantity			2,000	50 ...
Pin Contacts	24 to 20	0.50 to 0.25	4803G3-BK	4803G3
Socket Contacts	24 to 20	0.50 to 0.25	4802G3-BK	4802G3

Retaining Clip

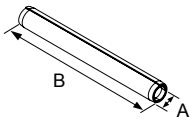
Retaining clips can be used in place of two retaining pins to hold auxiliary connectors or air tubes. Allows easier removal of auxiliary modules.



Description	-- Part Number --
Minimum Quantity	100 .....
For SBE®320 & SBX®350	2-8675P1

Retaining Pins

Retaining pins are used to hold acessories in the auxiliary port in SBE®, SBO®, & SBX® housings. Dimension “B” is +/- 0.015 in or 0.38 mm.



		Dimensions			
		- A -		- B -	
Description	- Part Number -	inches	mm	inches	mm
Minimum Quantity	1,000	.....			
For SBE®320 & SBX®350	110G59-BK	0.093 / 0.103	2.36 / 2.62	1.000	38.100

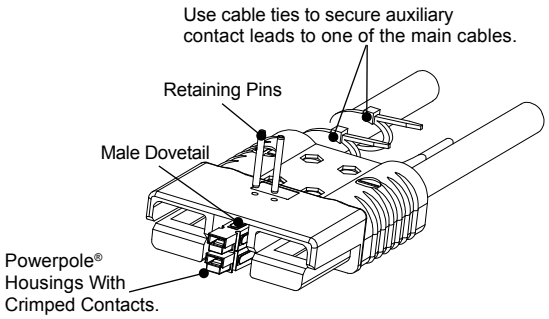
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Zip Cable Straps

Zip cable straps are used to secure auxiliary wires to the side of the main power cables.

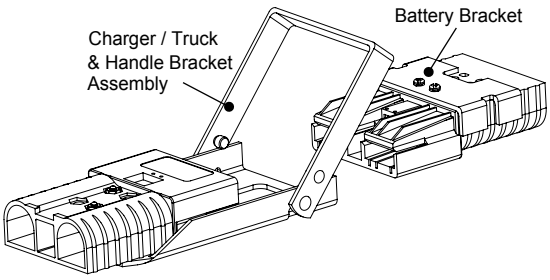
Description	--- Part Number ---
Minimum Quantity	1,000 .....
White	H1835P3



Manual Release - Battery Side

Works with the Charger / Truck side to ease mating and unmating connectors.

Description	---- Part Numbers ---	
Minimum Quantity	72	25 ....
Bracket and Hardware Kit	-	993G1
Battery Bracket Only	111961P1	-
Hardware Bag	-	106G6



Manual Release - Charger/ Truck Side

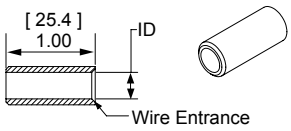
Works with the Battery side to ease mating and unmating connectors.

Description	- Part Numbers -
Minimum Quantity	25 .....
Bracket and Hardware Kit	994G1
Bracket / Lever Only	B00511G4
Hardware Bag	106G6

Reducing Bushings: for Use with Contact # 6354 and Bushing # 5918

Use with contact part number 6354-BK and bushing part number 5918-BK to allow a smaller wire to be used with the connector. Electrical capability is derated with smaller wire.

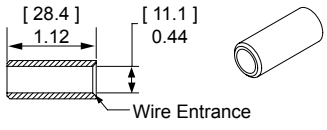
Bushing # 5918 Barrel Size	Wire Size	---------- Part Numbers ----------				Dimensions - ID - inches	mm
Minimum Quantity		1,500	1,000	500	100	.....	
1/0 AWG [53.5 mm²]	#1 AWG [42.4 mm²]	-	-	5687-BK	5687	0.39	9.91
1/0 AWG [53.5 mm²]	#2 AWG [33.6 mm²]	5690-BK	-	-	5690	0.34	8.64
1/0 AWG [53.5 mm²]	#4 AWG [21.2 mm²]	-	5693-BK	-	5693	0.27	6.86
1/0 AWG [53.5 mm²]	#6 AWG [13.3 mm²]	-	5663-BK	-	5663	0.22	5.59
1/0 AWG [53.5 mm²]	#10 - 8 AWG [5.3 - 8.4 mm²]	5648-BK	-	-	5648	0.19	4.83



Reducing Bushings: for Use with Contact # 6354

Use with contact part number 6354-BK to allow a smaller wire to be used with the connector. Electrical capability is derated with smaller wire.

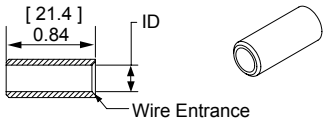
Contact Barrel Size	Wire Size	--- Part Number ---	
Minimum Quantity		500	100 ...
2/0 AWG [67.4 mm²]	1/0 AWG [53.5 mm²]	5918-BK	5918



Reducing Bushings: for Use with Contact # 6394

Use with contact part number 6394-BK to allow a smaller wire to be used with the connector. Electrical capability is derated with smaller wire.

Contact Barrel Size	Wire Size	-- Part Numbers --		Dimensions - ID - inches	mm
Minimum Quantity		1,000	100		
35 mm²	16 mm²	5920-BK	5920	0.23	5.8



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SBO® / SBE® / SBX®
- Tooling Information

Wire Size		Loose Piece Part Numbers	Loose Piece Contact Crimp Tool				
AWG	mm²	Contacts	Pneumatic Bench Tool +	Die +	Locator	Number of Crimps or	Hand Tool
SBE 320 / SBX 350							
300 MCM	152	6358	N/A	N/A	N/A	N/A	1368 Series
4/0 AWG	107.2	6356	1387G2	1303G12	1304G28	Double	
3/0 AWG	85	6355					
2/0 AWG	67.4	6354					
#2	N/A	6394		1303G2	1304G28		
N/A	95 mm²	1341G3	1387G2	1303G17	1304G35	Double	
N/A	70 mm²	1341G2		1303G12	1304G34		
N/A	50 mm²	1341G1		1303G8	1304G36		
SBE 160 / SBX 175							
1/0 AWG	53.5	6384G1	1387G2	1303G2	1304G13	Single	1368 Series
#2	35 mm²	6384G2	1387G1	1388G3	1389G3		
			1387G2	1303G2	1304G13		
SBO 60 / SBE 80							
#4	25	1339G4	1387G1	1388G7	1389G9	Single	N/A
#6	16	1339G1		1388G6			1309G4
Powerpole 15/45 Auxiliary Contacts **							
#16 / 20	1.3 / .52	1332	1367G1	N/A	N/A	Single	1309G2 or 1309G8
#12 / 16	3.3 / 1.3	1331					
PowerMod 1x4 Auxiliary Contacts							
#12 / 24	2.5 / .25	All Crimp Pins	TP0001*	N/A	TL0001	Single	TM0001*
		All Crimp Sockets			TL0002		PM1000G1
		PPMX Auxiliary Contacts					
#20 / 24	0.50 / 0.25	4803G3	TP0001*	N/A	TL0005	Single	TM0001* or
		4802G3					PM1000G1

* TP0001 and TM0001 tools require locators to properly position contacts.
** See Powerpole® family tooling chart for other Powerpole® contacts

SBE®160 / SBX®175 Power Contact Extraction Tool: 969P1
SBE®320 / SBX®350 Power Contact Extraction Tool: 970P1
1 x 4 Auxiliary contact Insertion Tool: PM10023G1
1 x 4 Auxiliary Contact Extraction Tool: PM1003G1

The auxiliary contacts used with wire sizes #16 - #24 AWG cannot be properly inserted without the insertion tool. Properly installed auxiliary contact of al wire gauges cannot be removed from the hosing without the extraction tool.

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