CATALOG

Russellstoll®

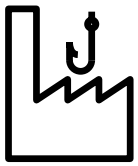
Pin & sleeve power connectors

Thomas & Betts is now ABB Installation Products, but our long legacy of quality products and innovation remains the same. From connectors that help wire buildings on Earth to cable ties that help put machines in space, we continue to work every day to make, market, design and sell products that provide a smarter, safer and more reliable flow of electricity, from source to socket.

Table of contents

Russellstoll® interconnection systems Overview/application guide

This catalog has been divided into sections based on standard application groups. The following is a description of each of the six general categories in which Russellstoll products appear. Applications are not limited to those listed below.

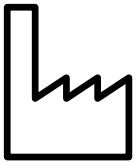


Heavy industrial/marine applications: outdoor, severe or high abuse environments

- Industrial hook-ups
- Shore-to-ship power connections stations
- Portable generator sets
- Mills and process plants
- Agriculture
- Portable power connections
- Aerospace manufacturing and airports
- Lift stations
- Irrigation and wastewater equipment
- Industrial and shipyard welding
- Power distribution centers
- Job site power: For telephone power and communications equipment

Washdown and light marine applications: watertight/waterproof

- Food processing plants
- Pharmaceutical manufacturing
- Bottling and beverage plants
- Barge and workboat applications
- Pulp and paper factories
- Outdoor construction sites



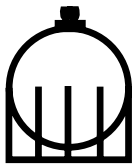
Industrial and commercial applications

- Entertainment (lighting and sound systems)
- Machinery
- Computer-related equipment
- Welding installations
- Construction sites
- Facilities' electrical power

Control circuit and industrial interlock applications

Automotive/industrial Interlock systems were designed for the needs of the manufacturing industry. These devices are used where safety requirements mandate a mechanically interlocked system for connection and removal of plugs under full load.

- Automatic press
- Heavy-duty portable welding
- Portable systems
- Machine tool control or Servo systems
- Shipyard maintenance power
- Battery chargers
- Automated welder applications
- Food processing
- Temporary power connections



Hazardous location applications: Class I, Div. 1/Class II, Div. 1

- Aerospace
- Steel mills and mining
- Petroleum
- Chemical
- Food processing
- Waste treatment

Computer systems: data center and OEM products

- Raised floor applications
- Main power connections
- Critical power for test, instrumentation, telephone and medical equipment

Overview/application guide

		Amperage						
Type		**20**	**30**	**50**	**60**	**100**	**200**	**400**
Heavy industrial/marine (pages 6–65)	Max-Gard®	–	●	–	●	●	●	●
	J-Line™	–	●	–	●	●	●	–
Washdown and light marine (pages 66–96)	DuraGard®	●	●	●	●	–	–	–
	FS/FD™	●	●	–	–	–	–	–
	Mechanically interlocked receptacles	●	●	●	–	–	–	–
Industrial and commercial (pages 113–138)	DuraTite™	●	●	–	–	–	–	–
	Standard Ever-Lok® (+midget)	●	●	●	–	–	–	–
	Heavy service Ever-Lok	–	●	–	●	●	–	–
Control circuit and industrial interlock (pages 139–157)	Control circuit connectors	●	–	–	–	–	–	–
	Industrial interlock systems (custom products)	●	●	–	●	●	●	●
Hazardous location (pages 158–165)	Max-Gard	–	●	–	●	●	–	–
	Interlocked switch receptacles	●	●	–	–	–	–	–
	Delayed action circuit breaking receptacles	●	●	–	–	–	–	–
	Safe ground indicator system	–	–	–	–	–	–	–
Computer systems (pages 167–175)	FS/FD and angle type DP	●	●	●	●	–	–	–
	Spec grade	●	●	●	–	–	–	–
	DuraGard	●	●	●	●	–	–	–

Max-Gard® interconnection systems
Overview

30 A–400 A (30–200 A load breaking), maximum 600 V AC/250 V DC receptacles, inlets, plugs, connectors, interlocked receptacles, explosion-proof interlocked receptacles.

Safety

- **Different power supply ratings can't mix:** 24 single-rate device polarizations ensure exact voltage, frequency and phase differentiation
- **Safe connections:** Safely connect and disconnect, even in the most extreme conditions such as heavy industrial and explosion-proof environments
- **Added safety measures:** Explosion-proof rating on all plugs
- **Plugs stay in:** Standard delayed-action pull-and-turn withdrawal offers all plugs an explosion-proof rating
- **Waterproof construction:** Standard O-ringed interior components provide environmental separation; watertight mated or unmated

Durability

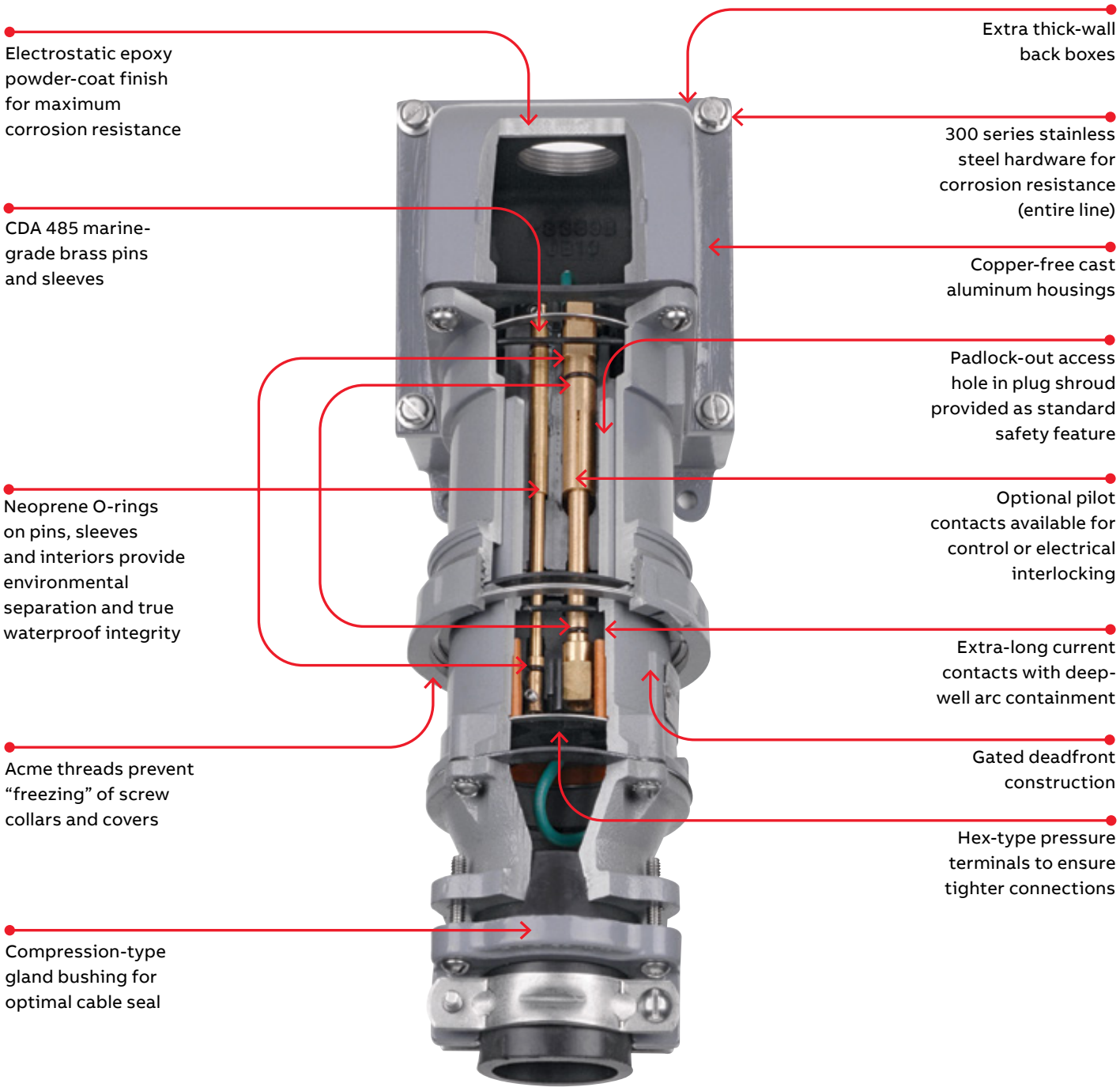
- **Built for durability:** Rugged cast aluminum housings with an electrostatic epoxy coating are standard, along with stainless steel hardware
- **The best connections for life:** Pins and sleeves are made from marine-grade CDA 485 brass; 200 A and 400 A pins and sleeves are silver plated

Performance

- **Foreign objects stay out:** All receptacles and connectors have a gated rotating disk (gated deadfront) on the face of the interior, which engages upon insertion
- **Any configuration you need:** Through 4-pole 5-wire configurations, all have a safety center earth ground pin design that makes first and breaks last
- **Ease of assembly:** Solderless pressure-type screw terminals with hex socket heads and rear-access, take-apart housings provide quick wiring access – No interior removal required for wiring receptacles and connectors
- **More control available:** Two optional pilot/control pins for contactors, load monitoring circuit, shunt trip or any other communication function you need
- **More power:** 150% non UL® rating enables Max-Gard installations to be extended up to 600 A custom loads with separate disconnect service

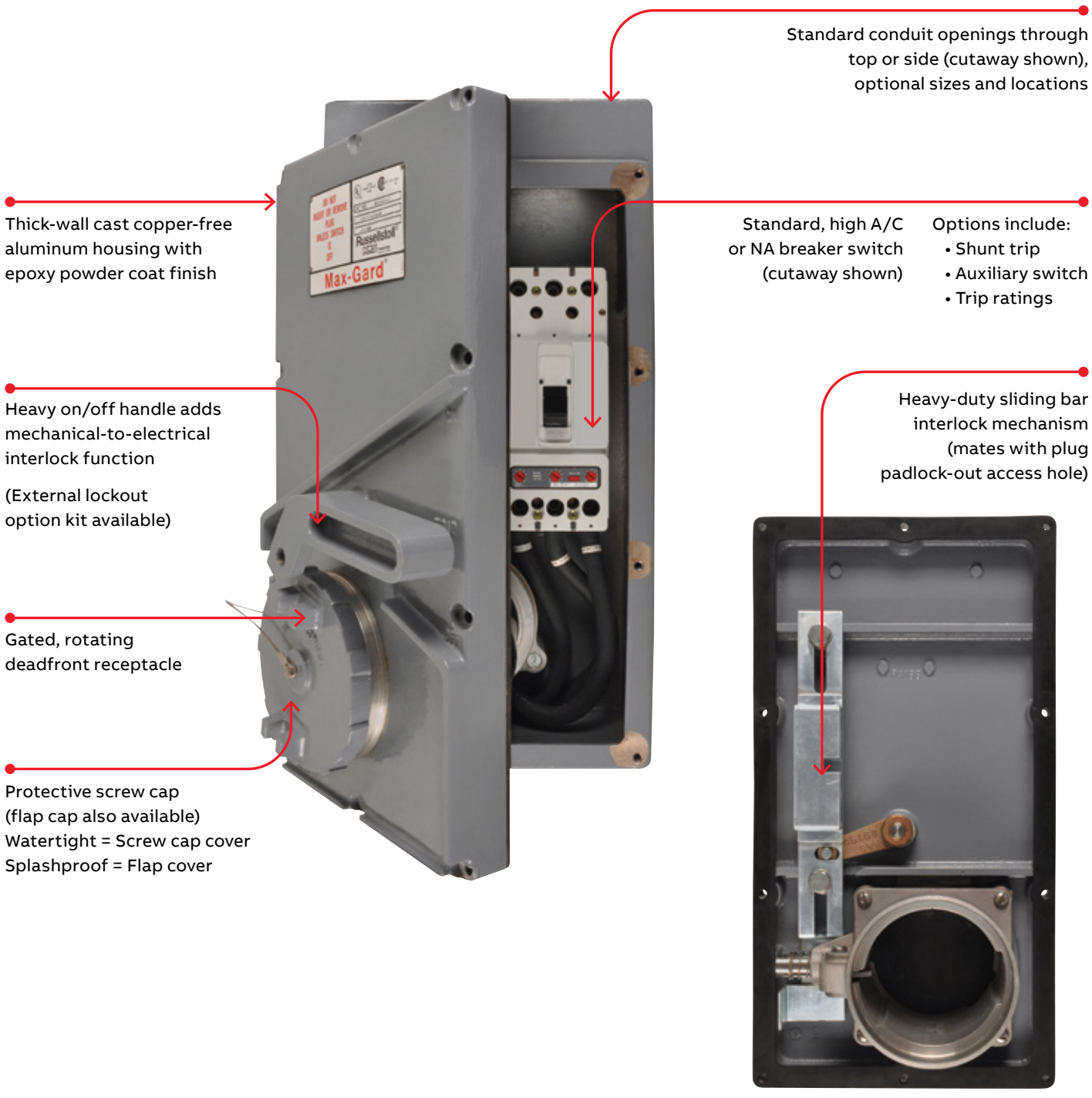
Plug and receptacle with angle adapter and junction box

- Delayed insertion/removal keyways provide explosion-proof approval for standard 30 A, 60 A and 100 A plugs and receptacles
- Available up to 4P5W + pilot; circuit interrupting/load breaking 30 A to 200 A
- Center ground contacts: Make first, break last
- Optional control/pilot contacts: Make last, break first



Cast aluminum circuit breaker interlocked receptacle (cutaway view)

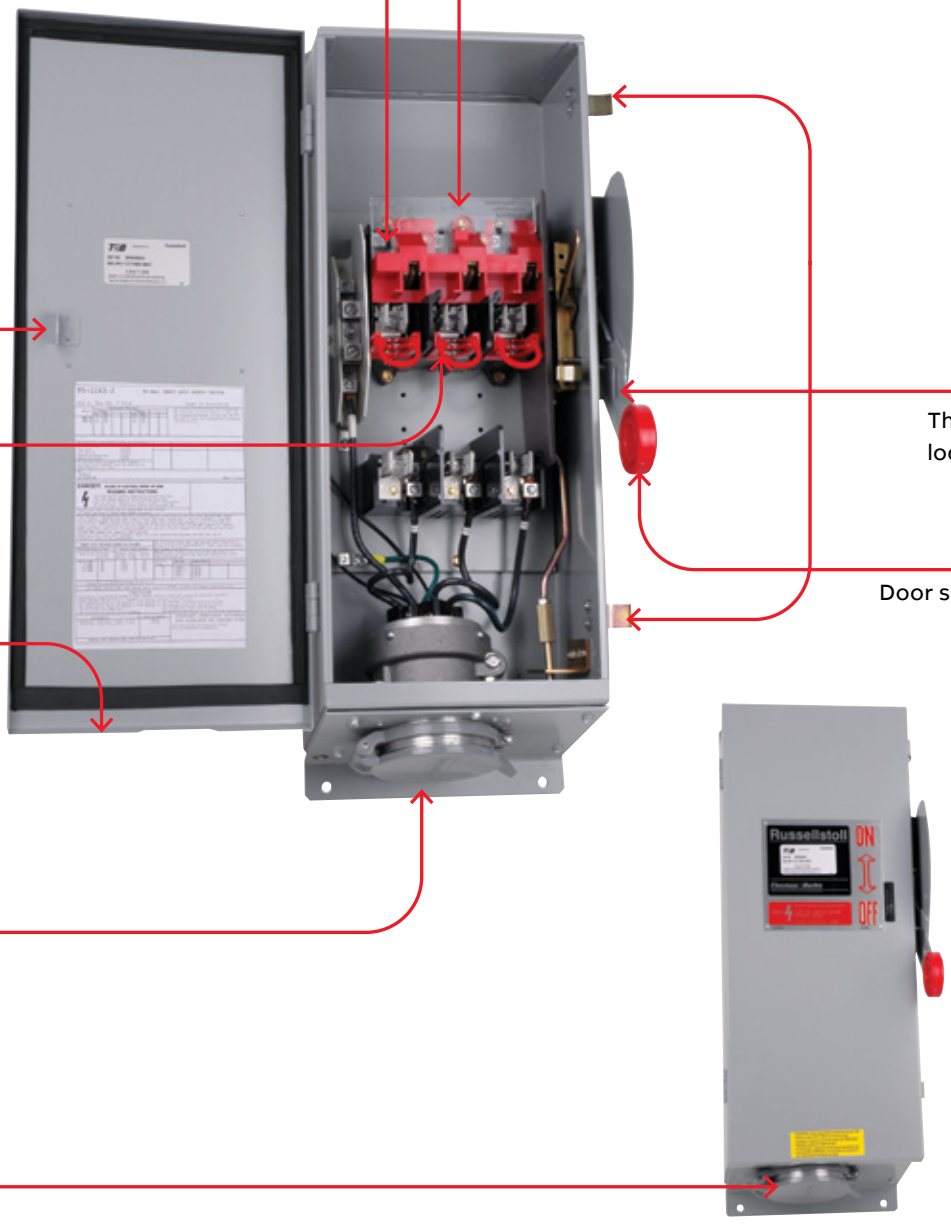
- 30 A–400 A (30–200 A load breaking), maximum 600 V AC/250 V DC receptacles, inlets, plugs, connectors, interlocked receptacles, explosion-proof interlocked receptacles
- NEMA 4X interlocks available in 30 A–400 A ranges through 4P5W, with two optional pilot/control contacts



Fused-disconnect switch* interlocked receptacle

- 30 A–400 A (30 A–200 A load breaking), maximum 600 V AC/250 V DC receptacles, inlets, plugs, connectors, interlocked receptacles, explosion-proof interlocked receptacles
- Available in 30 A, 60 A and 100 A sizes, all polarizations through 600 V AC
- Meets Federal specification WS865C, UL file #E5239 Meets UL 98, 50, 1682, 508, 231
- Meets NEC® Table 373-6(b)
- Meets major automotive specs

* Also available as switch only



Max-Gard® interconnection systems
Explosion-proof waterproof receptacles

Max-Gard DBRE and DSRE series interlocks are explosion proof and waterproof (O-ring sealed), along with optional control contacts, and are fully UL® listed.

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01 Approvals
- UL and CSA listed for hazardous locations
- Class I, Division 1, Groups B, C and D
- Class II, Division 1, Groups F and G UL File E10919
- NEMA 7, 8, 9
- CSA
- DOT shipboard used above deck “green water”
- NEMA 4X
- USCG approved

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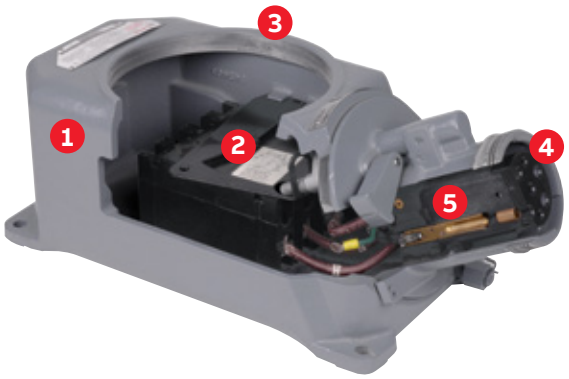
02 Approvals
- UL and CSA listed for hazardous locations
- Class I, Division 1, C and D
- Class II, Division 1, Groups F and G
- UL File E10919
- NEMA 7, 8, 9
- CSA
- DOT shipboard used above deck “green water”
- NEMA 4X
- USCG approved



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01

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02

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Explosion-proof waterproof circuit breaker interlocked receptacle

Available in 30 A, 60 A and 100 A sizes, all polarizations.

1. Heavy-duty cast aluminum housing, electrostatic epoxy coat finish
2. Standard, high AIC and NA (switched only) breakers available
3. Threaded access (cover not shown) with O-ring for explosion-proof and waterproof integrity
4. Gated deadfront safety
5. Drain plug
6. Factory-sealed receptacle interior – Accepts standard Max-Gard plugs

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Explosion-proof waterproof non-interlocked receptacle

Available in 30 A 480 V AC max, all polarizations.
- Factory-sealed interior (no filled conduits)
- Easy low-cost installation

1. Heavy-duty cast aluminum housing, electrostatic epoxy coat finish
2. Threaded access (cover not shown) with O-ring for explosion-proof and waterproof integrity
3. Gated deadfront for safety
4. All standard polarizations available to 480 V AC
5. Factory-sealed receptacle interior – Accepts standard Max-Gard plugs

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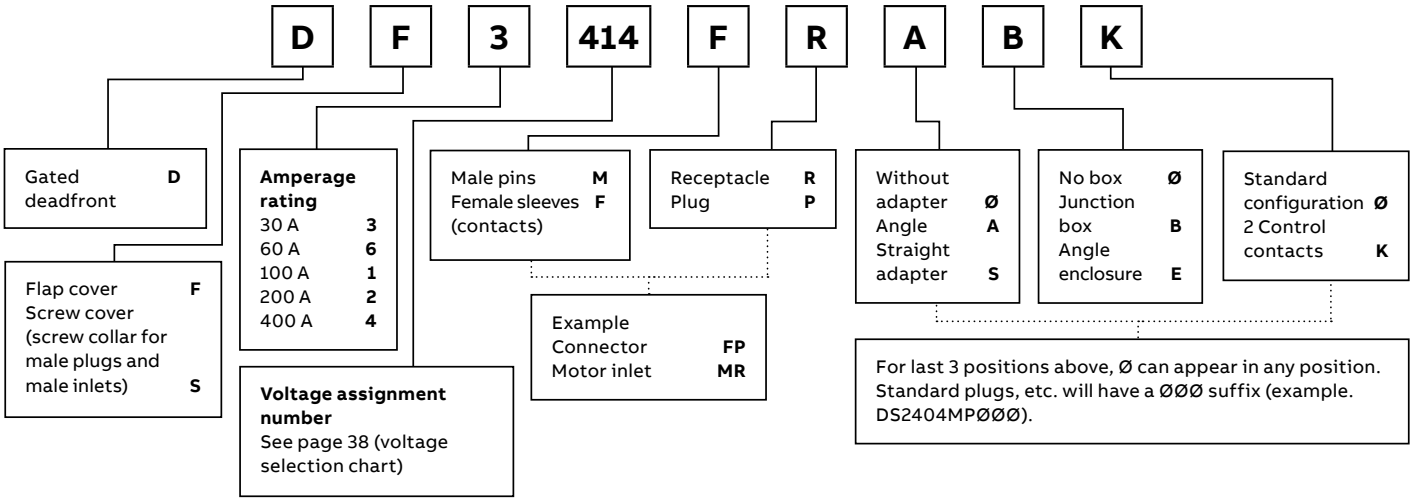
Receptacles, plugs and connectors

Feature	Russellstoll Max-Gard	Crouse-Hinds Arktite®**	Appleton Powertite®***
Center ground contact	Yes	No	No
24 single-rated factory polarizations	Yes	No	No
Gated deadfront construction	Yes	No	No
Two optional control contacts	Yes	No	No
Marine-grade CDA485 brass pins/sleeves (200 A–400 A silver-plated)	Yes	No	No
O-rings/environmental separation, full line	Yes	No	No
Available to 5-wire (4-pole, 5-wire)	Yes	30 A and 60 A only	No
Complete line epoxy powder coated – Standard	Yes	No	Some



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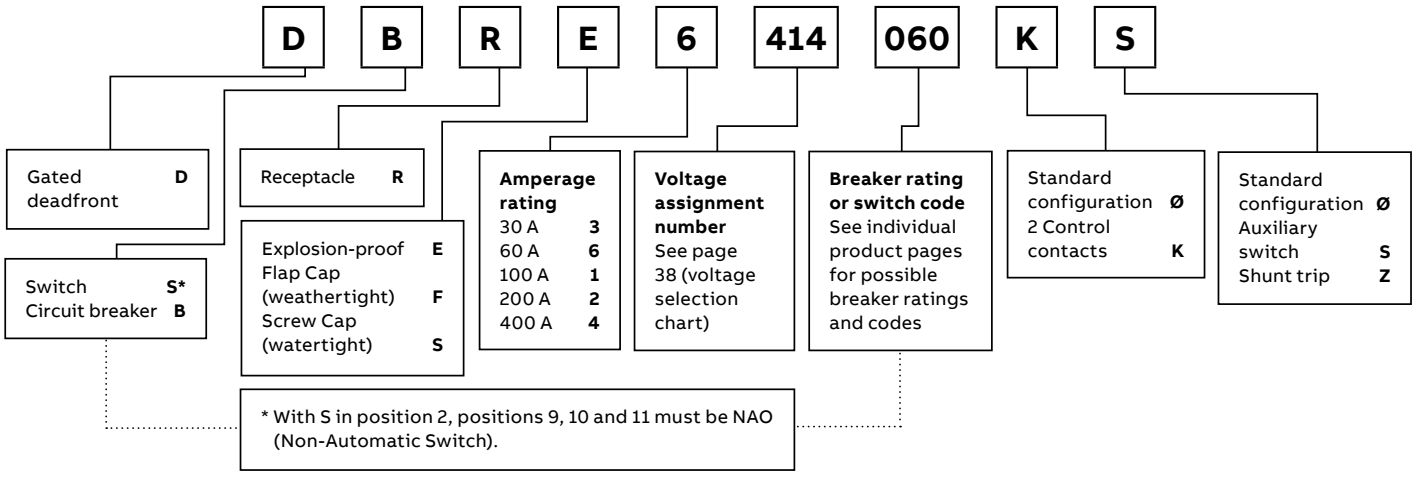
Interlocked receptacles

Feature	Russellstoll DBRE/DSRE series	Crouse-Hinds EPC series	Appleton EBR series (with FB breaker)
Waterproof (DurORing™) O-ring sealing	Yes	No	No
Available to 5-wire (4-pole, 5-wire) through 100 A	Yes	No	No
Gated deadfront	Yes	No	No
Center ground sleeve contact	Yes	No	No
24 single-rated factory polarizations	Yes	No	No
Class I, Div. 1, Groups B, C, D	Yes	Yes	Yes
Class II, Div. 1, Groups F and G	Yes	Yes	Yes*
Meets Coast Guard (was CG259) approvals	Yes	No	No

* Group F excepting electrically conductive dusts. ** Crouse-Hinds and Arktite are trademarks of Cooper Industries, Inc. *** Appleton and Powertite are trademarks of Appleton Electric Inc.



Max-Gard® interconnection systems

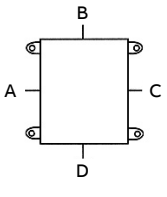
30 A standard service

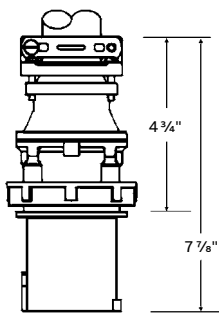
Device ratings and polarizations

Pole	Wire	Conductor placement	Voltage 60 Hz	Cat. no. ▼	Standard bushing I.D.† (in.)	Cat. no. ▼	Standard bushing I.D.† (in.)
Product type				**Male plug††**		**Female connector**	
2	3		277	DS3**104**MPØØØ	7/8	DF3**104**FPØØØ	7/8
			125	DS3**107**MPØØØ		DF3**107**FPØØØ	
2	3		480	DS3**204**MPØØØ	7/8	DF3**204**FPØØØ	7/8
			250	DS3**207**MPØØØ		DF3**207**FPØØØ	
			600	DS3**214**MPØØØ		DF3**214**FPØØØ	
			208	DS3**216**MPØØØ		DF3**216**FPØØØ	
3	4		277/480	DS3**304**MPØØØ	1	DF3**304**FPØØØ	1
			125/250	DS3**307**MPØØØ		DF3**307**FPØØØ	
			120/208	DS3**316**MPØØØ		DF3**316**FPØØØ	
3	4		3Ø 480	DS3**404**MPØØØ	1	DF3**404**FPØØØ	1
			3Ø 250	DS3**407**MPØØØ		DF3**407**FPØØØ	
			3Ø 600	DS3**414**MPØØØ		DF3**414**FPØØØ	
			3Ø 208	DS3**416**MPØØØ		DF3**416**FPØØØ	
			3Ø 440	DS3**421**MPØØØ		DF3**421**FPØØØ	
4	5		3ØY 277/480	DS3**504**MPØØØ	1 3/16	DF3**504**FPØØØ	1 3/16
			3ØY 347/600	DS3**514**MPØØØ		DF3**514**FPØØØ	
			3ØY 120/208	DS3**516**MPØØØ		DF3**516**FPØØØ	
			3ØY 250/440	DS3**521**MPØØØ		DF3**521**FPØØØ	

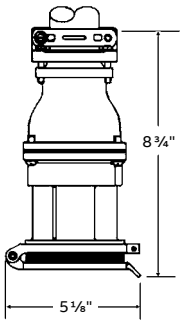
Maximum 600 V AC or 250 V DC.
** If receptacle is desired with a straight adapter instead of standard angle adapter, substitute "S" for the "A" in the catalog number of the receptacle with angle adapter or adapter and box.
† Standard cable bushings shown; see page 32 for other sizes available at no extra cost if specified on order.
†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS3CC.
▼ Control contacts for plug/receptacles: Use "K" where noted. Ex: DS3104MP00K. For adapters, junction boxes and accessories, see pages 32–35.

Dimensions





Male plug



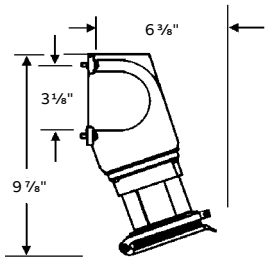
Female connector



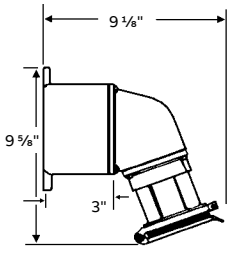

Cat. no. ▼ Female receptacle with angle enclosure	Cat. no. ▼ Female receptacle with angle adapter** and junction box	Cat. no. ▼ Female receptacle with angle adapter**	Cat. no. ▼ Female receptacle
DF3**104**FRØEØ	DF3**104**FRABØ	DF3**104**FRAØØ	DF3**104**FRØØØ
DF3**107**FRØEØ	DF3**107**FRABØ	DF3**107**FRAØØ	DF3**107**FRØØØ
DF3**204**FRØEØ	DF3**204**FRABØ	DF3**204**FRAØØ	DF3**204**FRØØØ
DF3**207**FRØEØ	DF3**207**FRABØ	DF3**207**FRAØØ	DF3**207**FRØØØ
DF3**214**FRØEØ	DF3**214**FRABØ	DF3**214**FRAØØ	DF3**214**FRØØØ
DF3**216**FRØEØ	DF3**216**FRABØ	DF3**216**FRAØØ	DF3**216**FRØØØ
DF3**304**FRØEØ	DF3**304**FRABØ	DF3**304**FRAØØ	DF3**304**FRØØØ
DF3**307**FRØEØ	DF3**307**FRABØ	DF3**307**FRAØØ	DF3**307**FRØØØ
DF3**316**FRØEØ	DF3**316**FRABØ	DF3**316**FRAØØ	DF3**316**FRØØØ
DF3**404**FRØEØ	DF3**404**FRABØ	DF3**404**FRAØØ	DF3**404**FRØØØ
DF3**407**FRØEØ	DF3**407**FRABØ	DF3**407**FRAØØ	DF3**407**FRØØØ
DF3**414**FRØEØ	DF3**414**FRABØ	DF3**414**FRAØØ	DF3**414**FRØØØ
DF3**416**FRØEØ	DF3**416**FRABØ	DF3**416**FRAØØ	DF3**416**FRØØØ
DF3**421**FRØEØ	DF3**421**MRABØ	DF3**421**FRAØØ	DF3**421**FRØØØ
DF3**504**FRØEØ	DF3**504**FRABØ	DF3**504**FRAØØ	DF3**504**FRØØØ
DF3**514**FRØEØ	DF3**514**FRABØ	DF3**514**FRAØØ	DF3**514**FRØØØ
DF3**516**FRØEØ	DF3**516**FRABØ	DF3**516**FRAØØ	DF3**516**FRØØØ
DF3**521**FRØEØ	DF3**521**FRABØ	DF3**521**FRAØØ	DF3**521**FRØØØ

Maximum lug wire 8 AWG 7-strand or flexible, cable entrance 0.187" diameter.
Receptacles furnished with flap cap also have screw thread to accept male collar on plug.
Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.
Boldface figures are for voltage assignment. For different ratings, see page 38.
Outlet furnished at location "B" unless otherwise specified. 1" NPT.
For full polarization, see page 38.

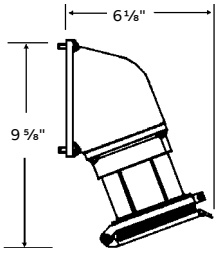
Dimensions



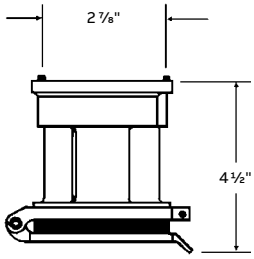
Female receptacle with angle enclosure



Female receptacle with angle adapter and junction box



Female receptacle with angle adapter

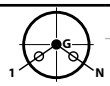
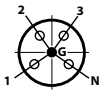


Female receptacle

Max-Gard® interconnection systems

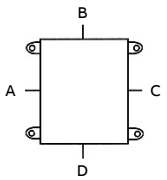
30 A reverse service

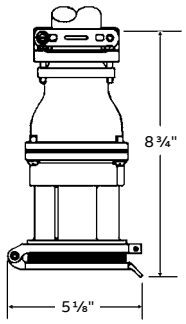
Device ratings and polarizations

Pole	Wire	Conductor placement	Voltage 60 hz	Cat. no. ▼	Standard bushing I.D.† (in.)	Cat. no. ▼	Standard bushing I.D.† (in.)
Product type				**Female connector**		**Male plug††**	
2	3		277	DF3**104**FPØØØ	⅞	DS3**104**MPØØØ	⅞
			125	DF3**107**FPØØØ		DS3**107**MPØØØ	
2	3		480	DF3**204**FPØØØ	⅞	DS3**204**MPØØØ	⅞
			250	DF3**207**FPØØØ		DS3**207**MPØØØ	
			600	DF3**214**FPØØØ		DS3**214**MPØØØ	
			208	DF3**216**FPØØØ		DS3**216**MPØØØ	
3	4		277/480	DF3**304**FPØØØ	1	DS3**304**MPØØØ	1
			125/250	DF3307FPØØØ		DS3**307**MPØØØ	
			120/208	DF3**316**FPØØØ		DS3**316**MPØØØ	
3	4		3Ø 480	DF3**404**FPØØØ	1	DS3**404**MPØØØ	1
			3Ø 250	DF3**407**FPØØØ		DS3**407**MPØØØ	
			3Ø 600	DF3**414**FPØØØ		DS3**414**MPØØØ	
			3Ø 208	DF3**416**FPØØØ		DS3**416**MPØØØ	
			3Ø 440	DF3**421**FPØØØ		DS3**421**MPØØØ	
4	5		3ØY 277/480	DF3**504**FPØØØ	1⅜16	DS3**504**MPØØØ	1⅜16
			3ØY 347/600	DF3**514**FPØØØ		DS3**514**MPØØØ	
			3ØY 120/208	DF3**516**FPØØØ		DS3**516**MPØØØ	
			3ØY 250/440	DF3**521**FPØØØ		DS3**521**MPØØØ	

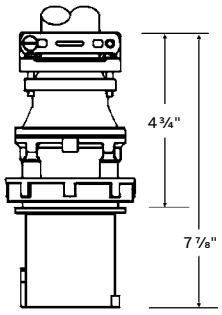
Maximum 600 V AC or 250 V DC.
** If receptacle is desired with a straight adapter instead of standard angle adapter, substitute "S" for the "A" in the catalog number of the receptacle with angle adapter or adapter and box.
† Standard cable bushings shown; see page 32 for other sizes available at no extra cost if specified on order.
†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS3CC.
▼ Control contacts for plug/receptacles: Use "K" where noted. Ex: DS3104MR00K. For adapters, junction boxes and accessories, see pages 32–35.

Dimensions





Female connector



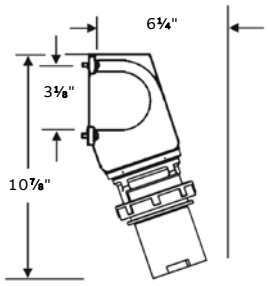
Male plug



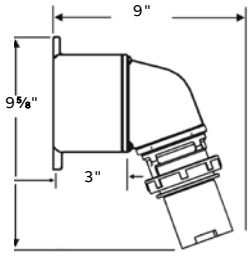

Cat. no. ▼ Male inlet with angle enclosure	Cat. no. ▼ Male inlet with angle adapter** and junction box	Cat. no. ▼ Male inlet with angle adapter**	Cat. no. ▼ Male Inlet††
DS3**104**MRØEØ	DS3**104**MRABØ	DS3**104**MRAØØ	DS3**104**MRØØØ
DS3**107**MRØEØ	DS3**107**MRABØ	DS3**107**MRAØØ	DS3**107**MRØØØ
DS3**204**MRØEØ	DS3**204**MRABØ	DS3**204**MRAØØ	DS3**204**MRØØØ
DS3**207**MRØEØ	DS3**207**MRABØ	DS3**207**MRAØØ	DS3**207**MRØØØ
DS3**214**MRØEØ	DS3**214**MRABØ	DS3**214**MRAØØ	DS3**214**MRØØØ
DS3**216**MRØEØ	DS3**216**MRABØ	DS3**216**MRAØØ	DS3**216**MRØØØ
DS3**304**MRØEØ	DS3**304**MRABØ	DS3**304**MRAØØ	DS3**304**MRØØØ
DS3**307**MRØEØ	DS3**307**MRABØ	DS3**307**MRAØØ	DS3**307**MRØØØ
DS3**316**MRØEØ	DS3**316**MRABØ	DS3**316**MRAØØ	DS3**316**MRØØØ
DS3**404**MRØEØ	DS3**404**MRABØ	DS3**404**MRAØØ	DS3**404**MRØØØ
DS3**407**MRØEØ	DS3**407**MRABØ	DS3**407**MRAØØ	DS3**407**MRØØØ
DS3**414**MRØEØ	DS3**414**MRABØ	DS3**414**MRAØØ	DS3**414**MRØØØ
DS3**416**MRØEØ	DS3**416**MRABØ	DS3**416**MRAØØ	DS3**416**MRØØØ
DS3**421**MRØEØ	DS3**421**MRABØ	DS3**421**MRAØØ	DS3**421**MRØØØ
DS3**504**MRØEØ	DS3**504**MRABØ	DS3**504**MRAØØ	DS3**504**MRØØØ
DS3**514**MRØEØ	DS3**514**MRABØ	DS3**514**MRAØØ	DS3**514**MRØØØ
DS3**516**MRØEØ	DS3**516**MRABØ	DS3**516**MRAØØ	DS3**516**MRØØØ
DS3**521**MRØEØ	DS3**521**MRABØ	DS3**521**MRAØØ	DS3**521**MRØØØ

Maximum lug wire 4 AWG 7-strand or flexible, cable entrance 0.187" diameter.
Receptacles furnished with flap cap also have screw thread to accept male collar on plug.
Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.
Boldface figures are for voltage assignment. For different ratings, see page 38.
Outlet furnished at location "B" unless otherwise specified. 1" NPT.
For full polarization, see page 38.

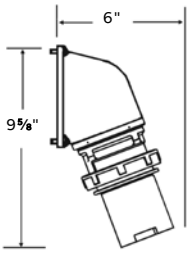
Dimensions



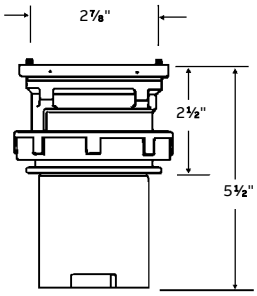
Male inlet with angle enclosure



Male inlet with angle adapter and junction box



Male inlet with angle adapter



Male inlet

Max-Gard® interconnection systems

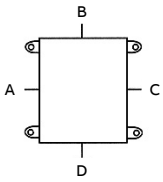
60 A standard service

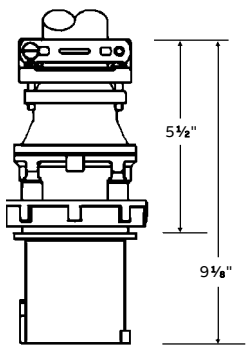
Device ratings and polarizations

Pole	Wire	Conductor placement	Voltage 60 Hz	Cat. no. ▼	Standard bushing I.D.† (in.)	Cat. no. ▼	Standard bushing I.D.† (in.)
Product type				**Male plug††**		**Female connector**	
2	3		277	DS6**104**MPØØØ	1 3/16	DF6**104**FPØØØ	1 3/16
			125	DS6**107**MPØØØ		DF6**107**FPØØØ	
2	3		480	DS6**204**MPØØØ	1 3/16	DF6**204**FPØØØ	1 3/16
			250	DS6**207**MPØØØ		DF6**207**FPØØØ	
			600	DS6**214**MPØØØ		DF6**214**FPØØØ	
			208	DS6**216**MPØØØ		DF6**216**FPØØØ	
3	4		277/480	DS6**304**MPØØØ	1 5/16	DF6**304**FPØØØ	1 5/16
			125/250	DS6**307**MPØØØ		DF6**307**FPØØØ	
			120/208	DS6**316**MPØØØ		DF6**316**FPØØØ	
3	4		3Ø 480	DS6**404**MPØØØ	1 5/16	DF6**404**FPØØØ	1 5/16
			3Ø 250	DS6**407**MPØØØ		DF6**407**FPØØØ	
			3Ø 600	DS6**414**MPØØØ		DF6**414**FPØØØ	
			3Ø 208	DS6**416**MPØØØ		DF6**416**FPØØØ	
			3Ø 440	DS6**421**MPØØØ		DF6**421**FPØØØ	
4	5		3ØY 277/480	DS6**504**MPØØØ	1 1/2	DF6**504**FPØØØ	1 1/2
			3ØY 347/600	DS6**514**MPØØØ		DF6**514**FPØØØ	
			3ØY 110/208	DS6**516**MPØØØ		DF6**516**FPØØØ	
			3ØY 250/440	DS6**521**MPØØØ		DF6**521**FPØØØ	

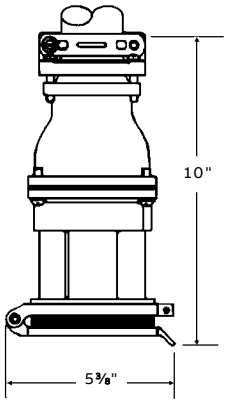
Maximum 600 V AC or 250 V DC.
** If receptacle is desired with a straight adapter instead of standard angle adapter, substitute "S" for the "A" in the catalog number of the receptacle with angle adapter or adapter and box.
† Standard cable bushings shown; see page 32 for other sizes available at no extra cost if specified on order.
†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS6CC
▼ Control contacts for plug/receptacles: Use "K" where noted. Ex: DS6104MP00K. For adapters, junction boxes and accessories, see pages 32–35.

Dimensions





Male plug



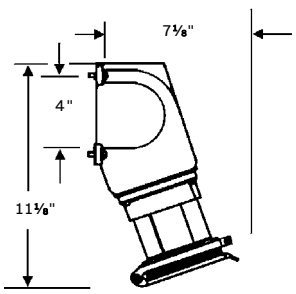
Female connector



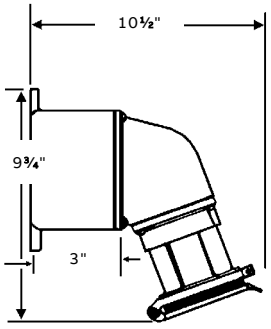

Cat. no. ▼ Female receptacle with angle enclosure	Cat. no. ▼ Female receptacle with angle adapter** and junction box	Cat. no. ▼ Female receptacle with angle adapter**	Cat. no. ▼ Female receptacle
DF6**104**FRØEØ	DF6**104**FRABØ	DF6**104**FRAØØ	DF6**104**FRØØØ
DF6**107**FRØEØ	DF6**107**FRABØ	DF6**107**FRAØØ	DF6**107**FRØØØ
DF6**204**FRØEØ	DF6**204**FRABØ	DF6**204**FRAØØ	DF6**204**FRØØØ
DF6**207**FRØEØ	DF6**207**FRABØ	DF6**207**FRAØØ	DF6**207**FRØØØ
DF6**214**FRØEØ	DF6**214**FRABØ	DF6**214**FRAØØ	DF6**214**FRØØØ
DF6**216**FRØEØ	DF6**216**FRABØ	DF6**216**FRAØØ	DF6**216**FRØØØ
DF6**304**FRØEØ	DF6**304**FRABØ	DF6**304**FRAØØ	DF6**304**FRØØØ
DF6**307**FRØEØ	DF6**307**FRABØ	DF6**307**FRAØØ	DF6**307**FRØØØ
DF6**316**FRØEØ	DF6**316**FRABØ	DF6**316**FRAØØ	DF6**316**FRØØØ
DF6**404**FRØEØ	DF6**404**FRABØ	DF6**404**FRAØØ	DF6**404**FRØØØ
DF6**407**FRØEØ	DF6**407**FRABØ	DF6**407**FRAØØ	DF6**407**FRØØØ
DF6**414**FRØEØ	DF6**414**FRABØ	DF6**414**FRAØØ	DF6**414**FRØØØ
DF6**416**FRØEØ	DF6**416**FRABØ	DF6**416**FRAØØ	DF6**416**FRØØØ
DF6**421**FRØEØ	DF6**421**FRABØ	DF6**421**FRAØØ	DF6**421**FRØØØ
DF6**504**FRØEØ	DF6**504**FRABØ	DF6**504**FRAØØ	DF6**504**FRØØØ
DF6**514**FRØEØ	DF6**514**FRABØ	DF6**514**FRAØØ	DF6**514**FRØØØ
DF6**516**FRØEØ	DF6**516**FRABØ	DF6**516**FRAØØ	DF6**516**FRØØØ
DF6**521**FRØEØ	DF6**521**FRABØ	DF6**521**FRAØØ	DF6**521**FRØØØ

Maximum lug wire 4 AWG 7-strand or flexible, cable entrance 0.302" diameter.
Receptacles furnished with flap cap also have screw thread to accept male collar on plug.
Catalog numbers shown are for flap cap receptacles; change “DF” to “DS” for ordering screw cap.
Boldface figures are for voltage assignment. For different ratings, see page 38.
Outlet furnished at location “B” unless otherwise specified. 1½" NPT.
For full polarization, see page 38.

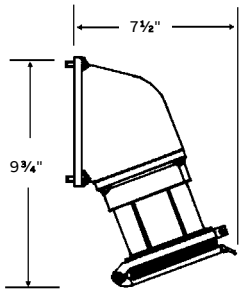
Dimensions



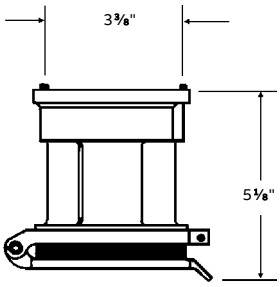
Female receptacle
with angle enclosure



Female receptacle
with angle adapter
and junction box



Female receptacle
with angle adapter



Female receptacle

Max-Gard® interconnection systems

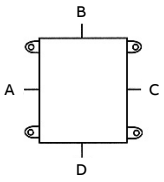
60 A reverse service

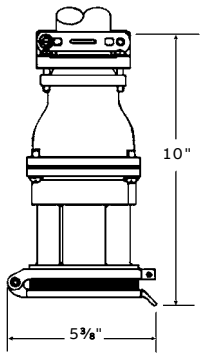
Device ratings and polarizations

Pole	Wire	Conductor placement	Voltage 60 hz	Cat. no. ▼	Standard bushing I.D.† (in.)	Cat. no. ▼	Standard bushing I.D.† (in.)
Product type				**Female connector**		**Male plug††**	
2	3		277	DF6**104**FPØØØ	1 3/16	DS6**104**MPØØØ	1 3/16
			125	DF6**107**FPØØØ		DS6**107**MPØØØ	
2	3		480	DF6**204**FPØØØ	1 3/16	DS6**204**MPØØØ	1 3/16
			250	DF6**207**FPØØØ		DS6**207**MPØØØ	
			600	DF6**214**FPØØØ		DS6**214**MPØØØ	
			208	DF6**216**FPØØØ		DS6**216**MPØØØ	
3	4		277/480	DF6**304**FPØØØ	1 5/16	DS6**304**MPØØØ	1 5/16
			125/250	DF6**307**FPØØØ		DS6**307**MPØØØ	
			120/208	DF6**316**FPØØØ		DS6**316**MPØØØ	
3	4		3Ø 480	DF6**404**FPØØØ	1 5/16	DS6**404**MPØØØ	1 5/16
			3Ø 250	DF6**407**FPØØØ		DS6**407**MPØØØ	
			3Ø 600	DF6**414**FPØØØ		DS6**414**MPØØØ	
			3Ø 208	DF6**416**FPØØØ		DS6**416**MPØØØ	
			3Ø 440	DF6**421**FPØØØ		DS6**421**MPØØØ	
4	5		3ØY 277/480	DF6**504**FPØØØ	1½	DS6**504**MPØØØ	1½
			3ØY 347/600	DF6**514**FPØØØ		DS6**514**MPØØØ	
			3ØY 120/208	DF6**516**FPØØØ		DS6**516**MPØØØ	
			3ØY 250/440	DF6**521**FPØØØ		DS6**521**MPØØØ	

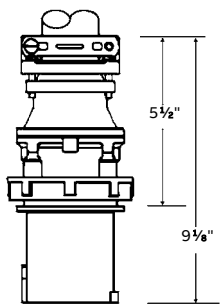
Maximum 600 V AC or 250 V DC.
** If receptacle is desired with a straight adapter instead of standard angle adapter, substitute "S" for the "A" in the catalog number of the receptacle with angle adapter or adapter and box.
† Standard cable bushings shown; see page 32 for other sizes available at no extra cost if specified on order.
†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS6CC
▼ Control contacts for plug/receptacles: Use "K" where noted. Ex: DS3104MP00K. For adapters, junction boxes and accessories, see pages 32–35.

Dimensions





Female connector



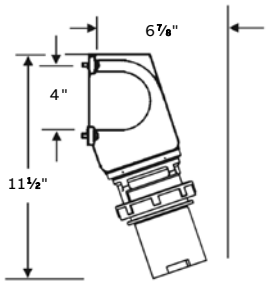
Male plug



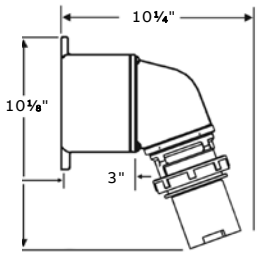

Cat. no. ▼ Male inlet with angle enclosure	Cat. no. ▼ Male inlet with angle adapter** and junction box	Cat. no. ▼ Male inlet with angle adapter**	Cat. no. ▼ Male inlet††
DS6**104**MRØEØ	DS6**104**MRABØ	DS6**104**MRAØØ	DS6**104**MRØØØ
DS6**107**MRØEØ	DS6**107**MRABØ	DS6**107**MRAØØ	DS6**107**MRØØØ
DS6**204**MRØEØ	DS6**204**MRABØ	DS6**204**MRAØØ	DS6**204**MRØØØ
DS6**207**MRØEØ	DS6**207**MRABØ	DS6**207**MRAØØ	DS6**207**MRØØØ
DS6**214**MRØEØ	DS6**214**MRABØ	DS6**214**MRAØØ	DS6**214**MRØØØ
DS6**216**MRØEØ	DS6**216**MRABØ	DS6**216**MRAØØ	DS6**216**MRØØØ
DS6**304**MRØEØ	DS6**304**MRABØ	DS6**304**MRAØØ	DS6**304**MRØØØ
DS6**307**MRØEØ	DS6**307**MRABØ	DS6**307**MRAØØ	DS6**307**MRØØØ
DS6**316**MRØEØ	DS6**316**MRABØ	DS6**316**MRAØØ	DS6**316**MRØØØ
DS6**404**MRØEØ	DS6**404**MRABØ	DS6**404**MRAØØ	DS6**404**MRØØØ
DS6**407**MRØEØ	DS6**407**MRABØ	DS6**407**MRAØØ	DS6**407**MRØØØ
DS6**414**MRØEØ	DS6**414**MRABØ	DS6**414**MRAØØ	DS6**414**MRØØØ
DS64**16**MRØEØ	DS6**416**MRABØ	DS6**416**MRAØØ	DS6**416**MRØØØ
DS6**421**MRØEØ	DS6**421**MRABØ	DS6**421**MRAØØ	DS6**421**MRØØØ
DS6**504**MRØEØ	DS6**504**MRABØ	DS6**504**MRAØØ	DS6**504**MRØØØ
DS6**514**MRØEØ	DS6**514**MRABØ	DS6**514**MRAØØ	DS6**514**MRØØØ
DS6**516**MRØEØ	DS6**516**MRABØ	DS6**516**MRAØØ	DS6**516**MRØØØ
DS6**521**MRØEØ	DS6**521**MRABØ	DS6**521**MRAØØ	DS6**521**MRØØØ

Maximum lug wire 4 AWG 7-strand or flexible, cable entrance 0.302" diameter.
Receptacles furnished with flap cap also have screw thread to accept male collar on plug.
Catalog numbers shown are for flap cap receptacles; change “DF” to “DS” for ordering screw cap.
Boldface figures are for voltage assignment. For different ratings, see page 38.
Outlet furnished at location “B” unless otherwise specified. 1½" NPT.
For full polarization, see page 38.

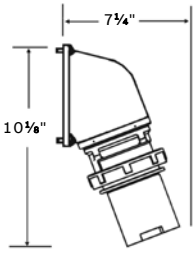
Dimensions



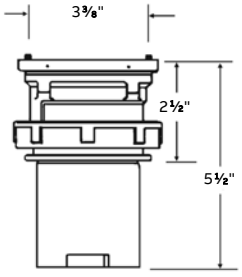
Male inlet with angle enclosure



Male inlet with angle adapter and junction box



Male inlet with angle adapter



Male inlet††

Max-Gard® interconnection systems

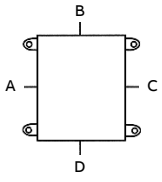
100 A standard service

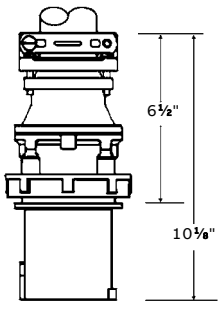
Device ratings and polarizations

Pole	Wire	Conductor placement	Voltage 60 hz	Cat. no. ▼	Standard bushing I.D.† (in.)	Cat. no. ▼	Standard bushing I.D.† (in.)
Product type				**Male plug††**		**Female connector**	
2	3		277	DS1**104**MPØØØ	1 11/16	DF1**104**FPØØØ	1 11/16
			125	DS1**107**MPØØØ		DF1**107**FPØØØ	
2	3		480	DS1**204**MPØØØ	1 11/16	DF1**204**FPØØØ	1 11/16
			250	DS1**207**MPØØØ		DF1**207**FPØØØ	
			600	DS1**214**MPØØØ		DF1**214**FPØØØ	
			208	DS1**216**MPØØØ		DF1**216**FPØØØ	
3	4		277/480	DS1**304**MPØØØ	1 13/16	DF1**304**FPØØØ	1 13/16
			125/250	DS1**307**MPØØØ		DF1**307**FPØØØ	
			120/208	DS1**316**MPØØØ		DF1**316**FPØØØ	
3	4		3Ø 480	DS1**404**MPØØØ	1 13/16	DF1**404**FPØØØ	1 13/16
			3Ø 250	DS1**407**MPØØØ		DF1**407**FPØØØ	
			3Ø 600	DS1**414**MPØØØ		DF1**414**FPØØØ	
			3Ø 208	DS1**416**MPØØØ		DF1**416**FPØØØ	
			3Ø 440	DS1**421**MPØØØ		DF1**421**FPØØØ	
4	5		3ØY 277/480	DS1**504**MPØØØ	2	DF1**504**FPØØØ	2
			3ØY 347/600	DS1**514**MPØØØ		DF1**514**FPØØØ	
			3ØY 118/208	DS1**516**MPØØØ		DF1**516**FPØØØ	
			3ØY 250/440	DS1**521**MPØØØ		DF1**521**FPØØØ	

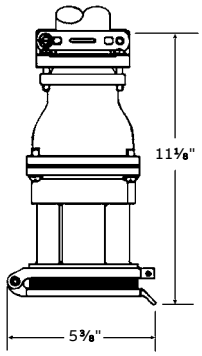
Maximum 600 V AC or 250 V DC.
** If receptacle is desired with a straight adapter instead of standard angle adapter, substitute "S" for the "A" in the catalog number of the receptacle with angle adapter or adapter and box.
† Standard cable bushings shown; see page 32 for other sizes available at no extra cost if specified on order.
†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS1CC.
▼ Control contacts for plug/receptacles: Use "K" where noted. Ex: DS1104MP00K. For adapters, junction boxes and accessories, see pages 32–35.

Dimensions





Male plug



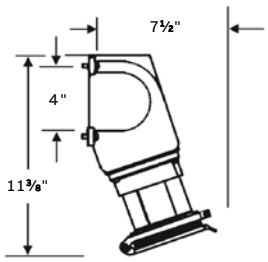
Female connector



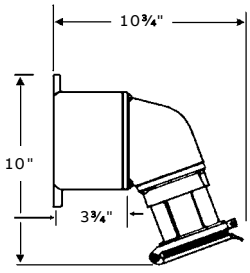

Cat. no. ▼ Female receptacle with angle enclosure	Cat. no. ▼ Female receptacle with angle adapter** and junction box	Cat. no. ▼ Female receptacle with angle adapter**	Cat. no. ▼ Female receptacle
DF1**104**FRØEØ	DF1**104**FRABØ	DF1**104**FRAØØ	DF1**104**FRØØØ
DF1**107**FRØEØ	DF1**107**FRABØ	DF1**107**FRAØØ	DF1**107**FRØØØ
DF1**204**FRØEØ	DF1**204**FRABØ	DF1**204**FRAØØ	DF1**204**FRØØØ
DF1**207**FRØEØ	DF1**207**FRABØ	DF1**207**FRAØØ	DF1**207**FRØØØ
DF1**214**FRØEØ	DF1**214**FRABØ	DF1**214**FRAØØ	DF1**214**FRØØØ
DF1**216**FRØEØ	DF1**216**FRABØ	DF1**216**FRAØØ	DF1**216**FRØØØ
DF1**304**FRØEØ	DF1**304**FRABØ	DF1**304**FRAØØ	DF1**304**FRØØØ
DF1**307**FRØEØ	DF1**307**FRABØ	DF1**307**FRAØØ	DF1**307**FRØØØ
DF1**316**FRØEØ	DF1**316**FRABØ	DF1**316**FRAØØ	DF1**316**FRØØØ
DF1**404**FRØEØ	DF1**404**FRABØ	DF1**404**FRAØØ	DF1**404**FRØØØ
DF1**407**FRØEØ	DF1**407**FRABØ	DF1**407**FRAØØ	DF1**407**FRØØØ
DF1**414**FRØEØ	DF1**414**FRABØ	DF1**414**FRAØØ	DF1**414**FRØØØ
DF1**416**FRØEØ	DF1**416**FRABØ	DF1**416**FRAØØ	DF1**416**FRØØØ
DF1**421**FRØEØ	DF1**421**FRABØ	DF1**421**FRAØØ	DF1**421**FRØØØ
DF1**504**FRØEØ	DF1**504**FRABØ	DF1**504**FRAØØ	DF1**504**FRØØØ
DF1**514**FRØEØ	DF1**514**FRABØ	DF1**514**FRAØØ	DF1**514**FRØØØ
DF1**516**FRØEØ	DF1**516**FRABØ	DF1**516**FRAØØ	DF1**516**FRØØØ
DF1**521**FRØEØ	DF1**521**FRABØ	DF1**521**FRAØØ	DF1**521**FRØØØ

Maximum lug wire 0 AWG 19-strand or 1 AWG flexible, cable entrance 0.386" diameter.
Receptacles furnished with flap cap also have screw thread to accept male collar on plug.
Catalog numbers shown are for flap cap receptacles; change “DF” to “DS” for ordering screw cap.
Boldface figures are for voltage assignment. For different ratings, see page 38.
Outlet furnished at location “B” unless otherwise specified. 2" NPT.
For full polarization, see page 38.

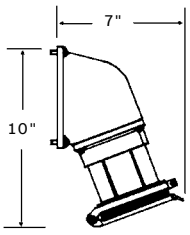
Dimensions



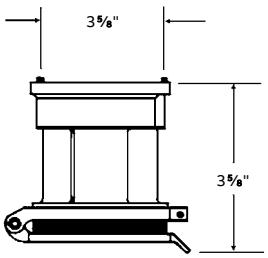
Female receptacle
with angle enclosure



Female receptacle
with angle adapter
and junction box



Female receptacle
with angle adapter



Female receptacle

Max-Gard® interconnection systems

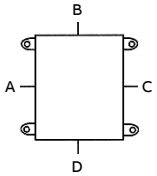
100 A reverse service

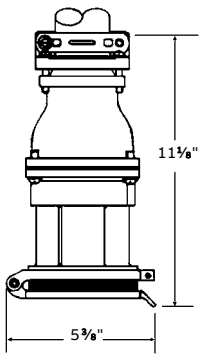
Device ratings and polarizations

Pole	Wire	Conductor placement	Voltage 60 hz	Cat. no. ▼	Standard bushing I.D.† (in.)	Cat. no. ▼	Standard bushing I.D.† (in.)
Product type				**Female connector**		**Male plug††**	
2	3		277	DF1**104**FPØØØ	1 11/16	DS1**104**MPØØØ	1 11/16
			125	DF1**107**FPØØØ		DS1**107**MPØØØ	
2	3		480	DF1**204**FPØØØ	1 11/16	DS1**204**MPØØØ	1 11/16
			250	DF1**207**FPØØØ		DS1**207**MPØØØ	
			600	DF1**214**FPØØØ		DS1**214**MPØØØ	
			208	DF1**216**FPØØØ		DS1**216**MPØØØ	
3	4		277/480	DF1**304**FPØØØ	1 13/16	DS1**304**MPØØØ	1 13/16
			125/250	DF1**307**FPØØØ		DS1**307**MPØØØ	
			120/208	DF1**316**FPØØØ		DS1**316**MPØØØ	
3	4		3Ø 480	DF1**404**FPØØØ	1 13/16	DS1**404**MPØØØ	1 13/16
			3Ø 250	DF1**407**FPØØØ		DS1**407**MPØØØ	
			3Ø 600	DF1**414**FPØØØ		DS1**414**MPØØØ	
			3Ø 208	DF1**416**FPØØØ		DS1**416**MPØØØ	
			3Ø 440	DF1**421**FPØØØ		DS1**421**MPØØØ	
4	5		3ØY 277/480	DF1**504**FPØØØ	2	DS1**504**MPØØØ	2
			3ØY 347/600	DF1**514**FPØØØ		DS1**514**MPØØØ	
			3ØY 110/208	DF1**516**FPØØØ		DS1**516**MPØØØ	
			3ØY 250/440	DF1**521**FPØØØ		DS1**521**MPØØØ	

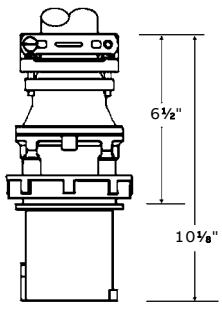
Maximum 600 V AC or 250 V DC.
** If receptacle is desired with a straight adapter instead of standard angle adapter, substitute "S" for the "A" in the catalog number of the receptacle with angle adapter or adapter and box.
† Standard cable bushings shown; see page 32 for other sizes available at no extra cost if specified on order.
†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS1CC.
▼ Control contacts for plug/receptacles: Use "K" where noted. Ex: DS1104MR00K. For adapters, junction boxes and accessories, see pages 32–35.

Dimensions





Female connector



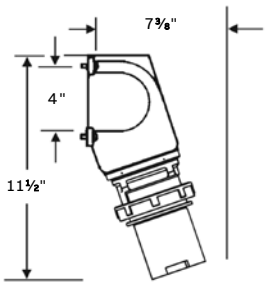
Male plug



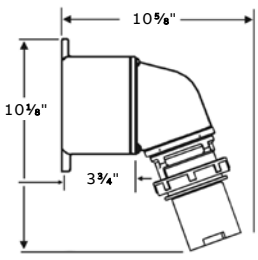

Cat. no. ▼ Male inlet with angle enclosure	Cat. no. ▼ Male inlet with angle adapter** and DJB3 junction box	Cat. no. ▼ Male inlet with angle adapter**	Cat. no. ▼ Male inlet††
DS1**104**MRØEØ	DS1**104**MRABØ	DS1**104**MRAØØ	DS1**104**MRØØØ
DS1**107**MRØEØ	DS1**107**MRABØ	DS1**107**MRAØØ	DS1**107**MRØØØ
DS1**204**MRØEØ	DS1**204**MRABØ	DS1**204**MRAØØ	DS1**204**MRØØØ
DS1**207**MRØEØ	DS1**207**MRABØ	DS1**207**MRAØØ	DS1**207**MRØØØ
DS1**214**MRØEØ	DS1**214**MRABØ	DS1**214**MRAØØ	DS1**214**MRØØØ
DS1**216**MRØEØ	DS1**216**MRABØ	DS1**216**MRAØØ	DS1**216**MRØØØ
DS1**304**MRØEØ	DS1**304**MRABØ	DS1**304**MRAØØ	DS1**304**MRØØØ
DS1**307**MRØEØ	DS1**307**MRABØ	DS1**307**MRAØØ	DS1**307**MRØØØ
DS1**316**MRØEØ	DS1**316**MRABØ	DS1**316**MRAØØ	DS1**316**MRØØØ
DS1**404**MRØEØ	DS1**404**MRABØ	DS1**404**MRAØØ	DS1**404**MRØØØ
DS1**407**MRØEØ	DS1**407**MRABØ	DS1**407**MRAØØ	DS1**407**MRØØØ
DS1**414**MRØEØ	DS1**414**MRABØ	DS1**414**MRAØØ	DS1**414**MRØØØ
DS1**416**MRØEØ	DS1**416**MRABØ	DS1**416**MRAØØ	DS1**416**MRØØØ
DS1**421**MRØEØ	DS1**421**MRABØ	DS1**421**MRAØØ	DS1**421**MRØØØ
DS1**504**MRØEØ	DS1**504**MRABØ	DS1**504**MRAØØ	DS1**504**MRØØØ
DS1**514**MRØEØ	DS1**514**MRABØ	DS1**514**MRAØØ	DS1**514**MRØØØ
DS1**516**MRØEØ	DS1**516**MRABØ	DS1**516**MRAØØ	DS1**516**MRØØØ
DS1**521**MRØEØ	DS1**521**MRABØ	DS1**521**MRAØØ	DS1**521**MRØØØ

Maximum lug wire 0 AWG 19-strand or 1 AWG flexible, cable entrance 0.386" diameter.
Receptacles furnished with flap cap also have screw thread to accept male collar on plug.
Catalog numbers shown are for flap cap receptacles; change “DF” to “DS” for ordering screw cap.
Boldface figures are for voltage assignment. For different ratings, see page 38.
Outlet furnished at location “B” unless otherwise specified. 2" NPT.
For full polarization, see page 38.

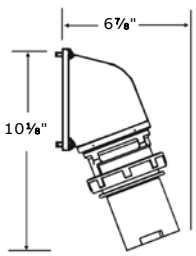
Dimensions



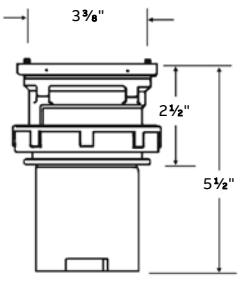
Male inlet with angle enclosure



Male inlet with angle adapter and DJB3 junction box



Male inlet with angle adapter



Male inlet

Max-Gard® interconnection systems

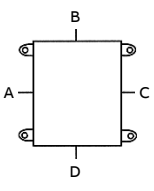
200 A standard service

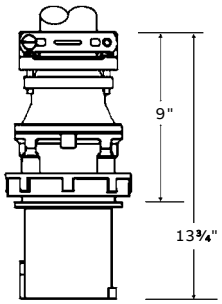
Device ratings and polarizations

Pole	Wire	Conductor placement	Voltage 60 hz	Cat. no. ▼	Standard bushing I.D.† (in.)	Cat. no. ▼	Standard bushing I.D.† (in.)
Product type				**Male plug††**		**Female connector**	
2	3		277	DS2**104**MPØØØ	2⅛	DF2**104**FPØØØ	2⅛
			125	DS2**107**MPØØØ		DF2**107**FPØØØ	
2	3		480	DS2**204**MPØØØ	2⅛	DF2**204**FPØØØ	2⅛
			250	DS2**207**MPØØØ		DF2**207**FPØØØ	
			600	DS2**214**MPØØØ		DF2**214**FPØØØ	
			208	DS2**216**MPØØØ		DF2**216**FPØØØ	
3	4		277/480	DS2**304**MPØØØ	2¼	DF2**304**FPØØØ	2¼
			125/250	DS2**307**MPØØØ		DF2**307**FPØØØ	
			120/208	DS2**316**MPØØØ		DF2**316**FPØØØ	
3	4		3Ø 480	DS2**404**MPØØØ	2¼	DF2**404**FPØØØ	2¼
			3Ø 250	DS2**407**MPØØØ		DF2**407**FPØØØ	
			3Ø 600	DS2**414**MPØØØ		DF2**414**FPØØØ	
			3Ø 208	DS2**416**MPØØØ		DF2**416**FPØØØ	
			3Ø 440	DS2**421**MPØØØ		DF2**421**FPØØØ	
4	5		3ØY 277/480	DS2**504**MPØØØ	2½	DF2**504**FPØØØ	2½
			3ØY 347/600	DS2**514**MPØØØ		DF2**514**FPØØØ	
			3ØY 110/208	DS2**516**MPØØØ		DF2**516**FPØØØ	
			3ØY 250/440	DS2**521**MPØØØ		DF2**521**FPØØØ	

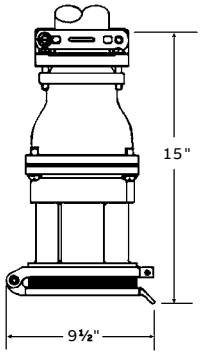
Maximum 600 V AC or 250 V DC.
** If receptacle is desired with a straight adapter instead of standard angle adapter, substitute "S" for the "A" in the catalog number of the receptacle with angle adapter or adapter and box.
† Standard cable bushings shown; see page 32 for other sizes available at no extra cost if specified on order.
†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS2CC.
▼ Control contacts for plug/receptacles: Use "K" where noted. Ex: DS2104MP00K. For adapters, junction boxes and accessories, see pages 32–35.

Dimensions





Male plug



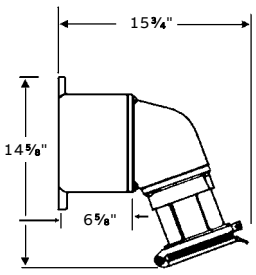
Female connector



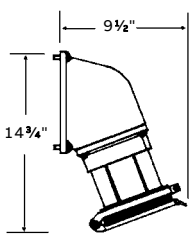
Cat. no. ▼ Female receptacle with angle adapter** and junction box	Cat. no. ▼ Female receptacle with angle adapter**	Cat. no. ▼ Female receptacle
DF2**104**FRABØ	DF2**104**FRAØØ	DF2**104**FRØØØ
DF2**107**FRABØ	DF2**107**FRAØØ	DF2**107**FRØØØ
DF2**204**FRABØ	DF2**204**FRAØØ	DF2**204**FRØØØ
DF2**207**FRABØ	DF2**207**FRAØØ	DF2**207**FRØØØ
DF2**214**FRABØ	DF2**214**FRAØØ	DF2**214**FRØØØ
DF2**216**FRABØ	DF2**216**FRAØØ	DF2**216**FRØØØ
DF2**304**FRABØ	DF2**304**FRAØØ	DF2**304**FRØØØ
DF2**307**FRABØ	DF2**307**FRAØØ	DF2**307**FRØØØ
DF2**316**FRABØ	DF2**316**FRAØØ	DF2**316**FRØØØ
DF2**404**FRABØ	DF2**404**FRAØØ	DF2**404**FRØØØ
DF2**407**FRABØ	DF2**407**FRAØØ	DF2**407**FRØØØ
DF2**414**FRABØ	DF2**414**FRAØØ	DF2**414**FRØØØ
DF2**416**FRABØ	DF2**416**FRAØØ	DF2**416**FRØØØ
DF2**421**FRABØ	DF2**421**FRAØØ	DF2**421**FRØØØ
DF2**504**FRABØ	DF2**504**FRAØØ	DF2**504**FRØØØ
DF2**514**FRABØ	DF2**514**FRAØØ	DF2**514**FRØØØ
DF2**516**FRABØ	DF2**516**FRAØØ	DF2**516**FRØØØ
DF2**521**FRABØ	DF2**521**FRAØØ	DF2**521**FRØØØ

Maximum lug wire 4/0 AWG 19-strand or flexible, cable entrance 0.625" diameter.
Receptacles furnished with flap cap also have screw thread to accept male collar on plug.
Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.
Boldface figures are for voltage assignment. For different ratings, see page 38.
Outlet furnished at location "B" unless otherwise specified. 3" NPT.
For full polarization, see page 38.

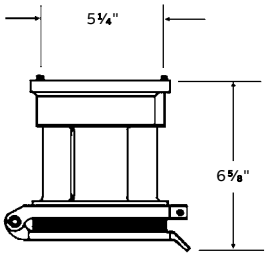
Dimensions



Female receptacle with angle adapter and junction box



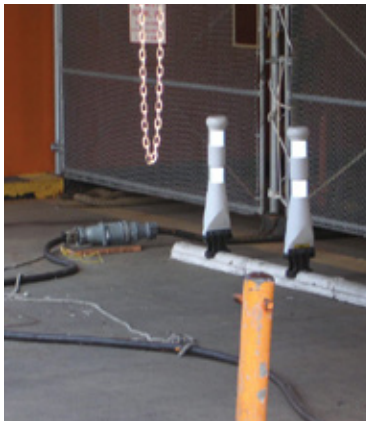
Female receptacle with angle adapter



Female receptacle

Staten Island Ferry

Solution 200 A



01

02

03

04

01 200 A Max-Gard connections on ferry deck

02 200 A Max-Gard inlets with disconnects

03 30 A and 200 A Max-Gard interlocks

04 200 A Max-Gard interlocks in parallel

Max-Gard® interconnection systems

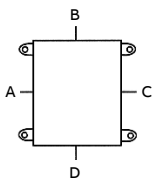
200 A reverse service

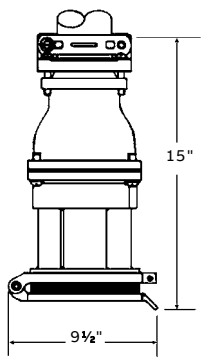
Device ratings and polarizations

Pole	Wire	Conductor placement	Voltage 60 hz	Cat. no. ▼ Female connector	Standard bushing I.D.† (in.)	Cat. no. ▼ Male plug††	Standard bushing I.D.† (in.)
Product type							
2	3		277	DF2**104**FPØØØ	2⅛	DS2**104**MPØØØ	2⅛
			125	DF2**107**FPØØØ		DS2**107**MPØØØ	
2	3		480	DF2**204**FPØØØ	2⅛	DS2**204**MPØØØ	2⅛
			250	DF2**207**FPØØØ		DS2**207**MPØØØ	
			600	DF2**214**FPØØØ		DS2**214**MPØØØ	
			208	DF2**216**FPØØØ		DS2**216**MPØØØ	
3	4		277/480	DF2**304**FPØØØ	2¼	DS2**304**MPØØØ	2¼
			125/250	DF2**307**FPØØØ		DS2**307**MPØØØ	
			120/208	DF2**316**FPØØØ		DS2**316**MPØØØ	
3	4		3Ø 480	DF2**404**FPØØØ	2¼	DS2**404**MPØØØ	2¼
			3Ø 250	DF2**407**FPØØØ		DS2**407**MPØØØ	
			3Ø 600	DF2**414**FPØØØ		DS2**414**MPØØØ	
			3Ø 208	DF2**416**FPØØØ		DS2**416**MPØØØ	
			3Ø 440	DF2**421**FPØØØ		DS2**421**MPØØØ	
4	5		3ØY 277/480	DF2**504**FPØØØ	2½	DS2**504**MPØØØ	2½
			3ØY 347/600	DF2**514**FPØØØ		DS2**514**MPØØØ	
			3ØY 110/208	DF2**516**FPØØØ		DS2**516**MPØØØ	
			3ØY 250/440	DF2**521**FPØØØ		DS2**521**MPØØØ	

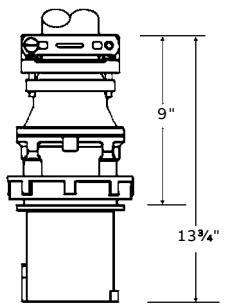
Maximum 600 V AC or 250 V DC.
** If receptacle is desired with a straight adapter instead of standard angle adapter, substitute "S" for the "A" in the catalog number of the receptacle with angle adapter or adapter and box.
† Standard cable bushings shown; see page 32 for other sizes available at no extra cost if specified on order.
†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS2CC.
▼ Control contacts for plug/receptacles: Use "K" where noted. Ex: DS2104MR00K. For adapters, junction boxes and accessories, see pages 32–35.

Dimensions





Female connector



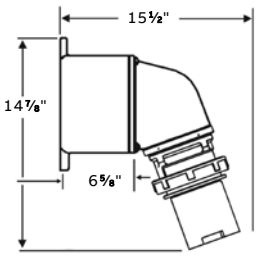
Male plug



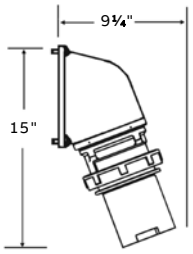
Cat. no. ▼ Male inlet with angle enclosure	Cat. no. ▼ Male inlet with angle adapter**	Cat. no. ▼ Male inlet††
DS2**104**MRABØ	DS2**104**MRAØØ	DS2**104**MRØØØ
DS2**107**MRABØ	DS2**107**MRAØØ	DS2**107**MRØØØ
DS2**204**MRABØ	DS2**204**MRAØØ	DS2**204**MRØØØ
DS2**207**MRABØ	DS2**207**MRAØØ	DS2**207**MRØØØ
DS2**214**MRABØ	DS2**214**MRAØØ	DS2**214**MRØØØ
DS2**216**MRABØ	DS2**216**MRAØØ	DS2**216**MRØØØ
DS2**304**MRABØ	DS2**304**MRAØØ	DS2**304**MRØØØ
DS2**307**MRABØ	DS2**307**MRAØØ	DS2**307**MRØØØ
DS2**316**MRABØ	DS2**316**MRAØØ	DS2**316**MRØØØ
DS2**404**MRABØ	DS2**404**MRAØØ	DS2**404**MRØØØ
DS2**407**MRABØ	DS2**407**MRAØØ	DS2**407**MRØØØ
DS2**414**MRABØ	DS2**414**MRAØØ	DS2**414**MRØØØ
DS2**416**MRABØ	DS2**416**MRAØØ	DS2**416**MRØØØ
DS2**421**MRABØ	DS2**421**MRAØØ	DS2**421**MRØØØ
DS2**504**MRABØ	DS2**504**MRAØØ	DS2**504**MRØØØ
DS2**514**MRABØ	DS2**514**MRAØØ	DS2**514**MRØØØ
DS2**516**MRABØ	DS2**516**MRAØØ	DS2**516**MRØØØ
DS2**521**MRABØ	DS2**521**MRAØØ	DS2**521**MRØØØ

Maximum lug wire 4/0 AWG 19-strand or flexible, cable entrance 0.625" diameter.
Receptacles furnished with flap cap also have screw thread to accept male collar on plug.
Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.
Boldface figures are for voltage assignment. For different ratings, see page 38.
Outlet furnished at location "B" unless otherwise specified. 3" NPT.
For full polarization, see page 38.

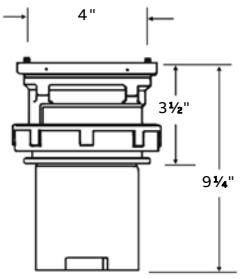
Dimensions



Male inlet with angle enclosure



Male inlet with angle adapter



Male inlet

MMI Trailer

Solution 200 A

Application:
Electrical hook-up of mobile medical imaging (MMI) trailers. Mobile medical units provide trailer-transportable blood banks, dental clinics, magnetic resonance imaging (MRI), X-ray and other diagnostic equipment to many hospitals and clinics throughout the country on a regular leased basis.
Safe outdoor usage connections are required for up to 200 A power supplies at each facility. Major specialized custom trailer manufacturers rely on the Max-Gard 200 A interface.

Installation:
Site-mounted 200 A receptacles with trailer-mounted plugs and connectors. When a mobile medical unit trailer is at the desired location, a heavy-duty Max-Gard 200 A cable assembly connects the trailer with a corresponding receptacle or connector at each site, usually mounted on an outside wall.
A primary safety feature is the receptacle's gated deadfront construction that ensures no exterior access to live receptacle contacts. With so many different hands involved on a daily basis, the Max-Gard epoxy powder-coat finish and rugged waterproof construction provide hospital-safe long service life.

Max-Gard® interconnection systems

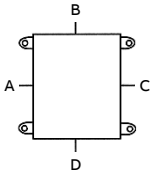
400 A standard service

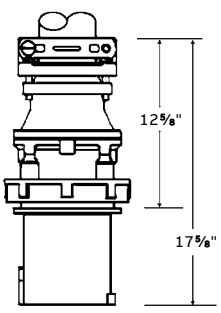
Device ratings and polarizations

Pole	Wire	Conductor placement	Voltage 60 hz	Cat. no. ▼	Standard bushing I.D.† (in.)	Cat. no. ▼	Standard bushing I.D.† (in.)
Product type				**Male plug††**		**Female connector**	
2	3		277	DS4**104**MPØØØ	2¾	DF4**104**FPØØØ	2¾
			125	DS4**107**MPØØØ		DF4**107**FPØØØ	
2	3		480	DS4**204**MPØØØ		DF4**204**FPØØØ	
			250	DS4**207**MPØØØ		DF4**207**FPØØØ	
			600	DS4**214**MPØØØ		DF4**214**FPØØØ	
			208	DS4**216**MPØØØ		DF4**216**FPØØØ	
3	4		277/480	DS4**304**MPØØØ	3	DF4**304**FPØØØ	3
			125/250	DS4**307**MPØØØ		DF4**307**FPØØØ	
			120/208	DS4**316**MPØØØ		DF4**316**FPØØØ	
3	4		3Ø 480	DS4**404**MPØØØ		DF4**404**FPØØØ	
			3Ø 250	DS4**407**MPØØØ		DF4**407**FPØØØ	
			3Ø 600	DS4**414**MPØØØ		DF4**414**FPØØØ	
			3Ø 208	DS4**416**MPØØØ		DF4**416**FPØØØ	
			3Ø 440	DS4**421**MPØØØ		DF4**421**FPØØØ	
4	5		3ØY 277/480	DS4**504**MPØØØ	3¼	DF4**504**FPØØØ	3¼
			3ØY 347/600	DS4**514**MPØØØ		DF4**514**FPØØØ	
			3ØY 110/208	DS4**516**MPØØØ		DF4**516**FPØØØ	
			3ØY 250/440	DS4**521**MPØØØ		DF4**521**FPØØØ	

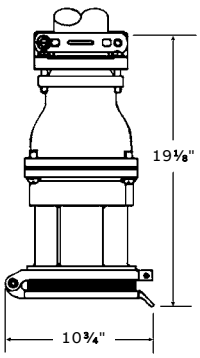
Maximum 600 V AC or 250 V DC.
** If receptacle is desired with a straight adapter instead of standard angle adapter, substitute "S" for the "A" in the catalog number of the receptacle with angle adapter or adapter and box.
† Standard cable bushings shown; see page 32 for other sizes available at no extra cost if specified on order.
†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS4CC.
▼ Control contacts for plug/receptacles: Use "K" where noted. Ex: DS4104MP00K. For adapters, junction boxes and accessories, see pages 32–35.

Dimensions





Male plug



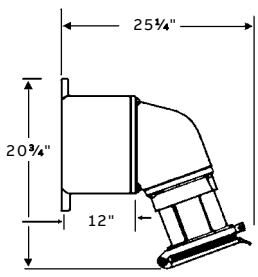
Female connector



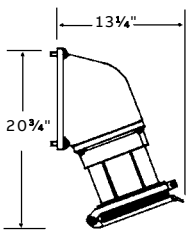
Cat. no. ▼ Female receptacle with angle adapter** and junction box	Cat. no. ▼ Female receptacle with angle adapter**	Cat. no. ▼ Female receptacle
DF4**104**FRABØ	DF4**104**FRAØØ	DF4**104**FRØØØ
DF4**107**FRABØ	DF4**107**FRAØØ	DF4**107**FRØØØ
DF4**204**FRABØ	DF4**204**FRAØØ	DF4**204**FRØØØ
DF4**207**FRABØ	DF4**207**FRAØØ	DF4**207**FRØØØ
DF4**214**FRABØ	DF4**214**FRAØØ	DF4**214**FRØØØ
DF4**216**FRABØ	DF4**216**FRAØØ	DF4**216**FRØØØ
DF4**304**FRABØ	DF4**304**FRAØØ	DF4**304**FRØØØ
DF4**307**FRABØ	DF4**307**FRAØØ	DF4**307**FRØØØ
DF4**316**FRABØ	DF4**316**FRAØØ	DF4**316**FRØØØ
DF4**404**FRABØ	DF4**404**FRAØØ	DF4**404**FRØØØ
DF4**407**FRABØ	DF4**407**FRAØØ	DF4**407**FRØØØ
DF4**414**FRABØ	DF4**414**FRAØØ	DF4**414**FRØØØ
DF4**416**FRABØ	DF4**416**FRAØØ	DF4**416**FRØØØ
DF4**421**FRABØ	DF4**421**FRAØØ	DF4**421**FRØØØ
DF4**504**FRABØ	DF4**504**FRAØØ	DF4**504**FRØØØ
DF4**514**FRABØ	DF4**514**FRAØØ	DF4**514**FRØØØ
DF4**516**FRABØ	DF4**516**FRAØØ	DF4**516**FRØØØ
DF4**521**FRABØ	DF4**521**FRAØØ	DF4**521**FRØØØ

Maximum lug wire 500 kcmil 37-strand or flexible, cable entrance 0.937" diameter.
Receptacles furnished with flap cap also have screw thread to accept male collar on plug.
Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.
Boldface figures are for voltage assignment. For different ratings, see page 38.
Outlet furnished at location "B" unless otherwise specified. 4" NPT.
For full polarization, see page 38.

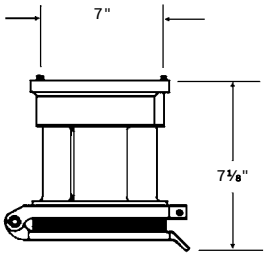
Dimensions



Female receptacle with angle adapter and junction box



Female receptacle with angle adapter



Female receptacle

Shore-to-ship power

Solution 400 A

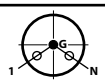
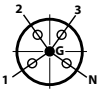
Application:
Shore power to marine vessels – Sightseeing boats. When docked, marine vessels need shore power when their engines aren't running. Dockside designs need to be as safe as possible during heavy use, rough treatment and adverse weather conditions. High amperage-rated systems are installed using parallel power delivery with cross-network protection.

Installation:
400 A male inlets and power connectors with control contacts. Watertight devices are necessary for dockside installations. Max-Gard connections go further with O-rings on both pins and interiors for environmental separation and true waterproof performance. The male inlet center ground pin feature and keyed entry design align easily, make ground first and break last, while quarter-turn insertion delayed-action removal and locking screw collars provide accidental pull-out protection. Upon connector insertion, two auxiliary control contacts complete a contactor circuit, which powers the line through a make-last-and-break-first configuration. Contactors are installed separately in an on-shore sheltered power distribution panel. This can be wired for each contactor or for multiple connections; if one plug is removed, power is cut off.

Max-Gard® interconnection systems

400 A reverse service

Device ratings and polarizations

Pole	Wire	Conductor placement	Voltage 60 hz	Cat. no. ▼ Female connector	Standard bushing I.D.† (in.)	Cat. no. ▼ Male plug††	Standard bushing I.D.† (in.)
2	3		277	DF4**104**FPØØØ	2¾	DS4**104**MPØØØ	2¾
			125	DF4**107**FPØØØ		DS4**107**MPØØØ	
2	3		480	DF4**204**FPØØØ		DS4**204**MPØØØ	
			250	DF4**207**FPØØØ		DS4**207**MPØØØ	
			600	DF4**214**FPØØØ		DS4**214**MPØØØ	
			208	DF4**216**FPØØØ		DS4**216**MPØØØ	
3	4		277/480	DF4**304**FPØØØ	3	DS4**304**MPØØØ	3
			125/250	DF4**307**FPØØØ		DS4**307**MPØØØ	
			120/208	DF4**316**FPØØØ		DS4**316**MPØØØ	
3	4		3Ø 480	DF4**404**FPØØØ		DS4**404**MPØØØ	
			3Ø 250	DF4**407**FPØØØ		DS4**407**MPØØØ	
			3Ø 600	DF4**414**FPØØØ		DS4**414**MPØØØ	
			3Ø 208	DF4**416**FPØØØ		DS4**416**MPØØØ	
			3Ø 440	DF4**421**FPØØØ		DS4**421**MPØØØ	
4	5		3ØY 277/480	DF4**504**FPØØØ	3¼	DS4**504**MPØØØ	3¼
			3ØY 347/600	DF4**514**FPØØØ		DS4**514**MPØØØ	
			3ØY 120/208	DF4**516**FPØØØ		DS4**516**MPØØØ	
			3ØY 250/440	DF4**521**FPØØØ		DS4**521**MPØØØ	

Maximum 600 V AC or 250 V DC

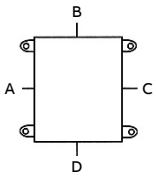
** If receptacle is desired with a straight adapter instead of standard angle adapter, substitute "S" for the "A" in the catalog number of the receptacle with angle adapter or adapter and box.

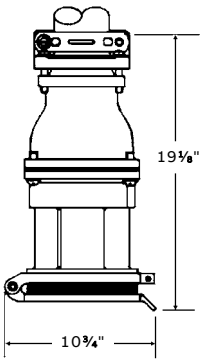
† Standard cable bushings shown; see page 32 for other sizes available at no extra cost if specified on order.

†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS4CC.

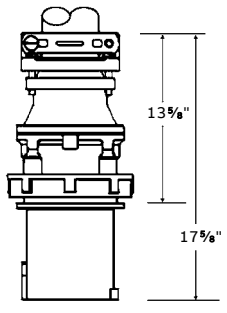
▼ Control contacts for plug/receptacles: Use "K" where noted. Ex: DS4104MR00K. For adapters, junction boxes and accessories, see pages 32–35.

Dimensions





Female connector

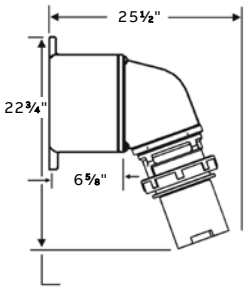


Male plug††

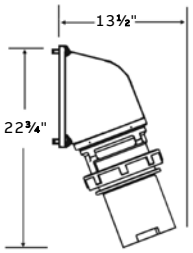
Cat. no. ▼ Male inlet with angle adapter** and junction box	Cat. no. ▼ Male inlet with angle adapter**	Cat. no. ▼ Male inlet††
DS4**104**MRABØ	DS4**104**MRAØØ	DS4**104**MRØØØ
DS4**107**MRABØ	DS4**107**MRAØØ	DS4**107**MRØØØ
DS4**204**MRABØ	DS4**204**MRAØØ	DS4**204**MRØØØ
DS4**207**MRABØ	DS4**207**MRAØØ	DS4**207**MRØØØ
DS4**214**MRABØ	DS4**214**MRAØØ	DS4**214**MRØØØ
DS4**216**MRABØ	DS4**216**MRAØØ	DS4**216**MRØØØ
DS4**304**MRABØ	DS4**304**MRAØØ	DS4**304**MRØØØ
DS4**307**MRABØ	DS4**307**MRAØØ	DS4**307**MRØØØ
DS4**316**MRABØ	DS4**316**MRAØØ	DS4**316**MRØØØ
DS4**404**MRABØ	DS4**404**MRAØØ	DS4**404**MRØØØ
DS4**407**MRABØ	DS4**407**MRAØØ	DS4**407**MRØØØ
DS4**414**MRABØ	DS4**414**MRAØØ	DS4**414**MRØØØ
DS4**416**MRABØ	DS4**416**MRAØØ	DS4**416**MRØØØ
DS4**421**MRABØ	DS4**421**MRAØØ	DS4**421**MRØØØ
DS4**504**MRABØ	DS4**504**MRAØØ	DS4**504**MRØØØ
DS4**514**MRABØ	DS4**514**MRAØØ	DS4**514**MRØØØ
DS4**516**MRABØ	DS4**516**MRAØØ	DS4**516**MRØØØ
DS4**521**MRABØ	DS4**521**MRAØØ	DS4**521**MRØØØ

Maximum lug wire 500 kcmil 37-strand or flexible, cable entrance 0.937" diameter.
Receptacles furnished with flap cap also have screw thread to accept male collar on plug.
Catalog numbers shown are for flap cap receptacles; change “DF” to “DS” for ordering screw cap.
Boldface figures are for voltage assignment. For different ratings, see page 38.
Outlet furnished at location “B” unless otherwise specified. 4" NPT.
For full polarization, see page 38.

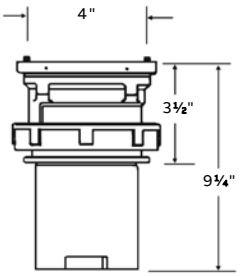
Dimensions



Male inlet with angle adapter and junction box



Male inlet with angle adapter



Male inlet

Max-Gard® interconnection systems

Cable bushings for Max-Gard plugs and connectors

Size No. 3 and 6 (identification letter inside hole)

Size No. 10, 20 and 40

- To order non-standard bushing, add cable bushing number to the end of a catalog number. The bushing is furnished at no additional cost at time of order.

  Ex: DF2504FP000/DF2032.

- Shaded areas show cable bushings provided with a strain-relief neck; larger bushings are collar style.

Cable bushings for Max-Gard plugs and connectors

Hole diameter for cable (in.)	Size 3 30 A		Size 6 60 A		Size 10 100 A		Size 20 200 A		Size 40 400 A	
0.625	**JG63**									
0.750	**JG64**		**JG104**							
0.875	**JG65**	Std. 2P3W	**JG105**							
1.000	**JG66**	Std. 3P4W	**JG106**		**DF1020**		**DF2020**			
1.188	**JG67**	Std. 4P5W	**JG107**	Std. 2P3W	**DF1022**		**DF2022**			
1.313			**JG108**	Std. 3P4W	**DF1024**		**DF2024**			
1.375	**JG69**									
1.500	**JG610**		**JG1010**	Std. 4P5W	**DF1026**		**DF2026**			
1.625										
1.688			**JG1011**		**DF1027**	Std. 2P3W	**DF2027**			
1.813					**DF1029**	Std. 3P4W	**DF2029**			
1.875			**JG1013**		**DF1030**		**DF2032**	Std. 2P3W		
2.000					**DF1032**	Std. 4P5W				
2.125							**DF2034**	Std. 3P4W		
2.250							**DF2036**	Std. 4P5W		
2.500							**DF2040**			
2.625									**DF4042**	
2.750									**DF4044**	
3.000									**DF4048**	Std. 3P4W
3.250									**DF4054**	Std. 4P5W

Standard cable bushings

Notes: When ordering, select bushing size slightly larger than your cable O.D. for best fit.
Material – Neoprene

Max-Gard® interconnection systems

Adapters for conduit and fittings & replacement flap covers and screw covers

JPA conduit adapters

- Adapters are tapped NPT standard pipe thread to accommodate rigid conduit or standard connectors for armored and non-metallic cable or flexible conduit.

Adapters for conduit and fittings

30 Amp cat. no.	Tapped hole size NPT (in.)	60 Amp cat. no.	Tapped hole size NPT (in.)	100 Amp cat. no.	Tapped hole size NPT (in.)	200 Amp cat. no.	Tapped hole size NPT (in.)	400 Amp cat. no.	Tapped hole size NPT (in.)
JPA62	¾	JPA104	1¼	DFA14	1¼	DFA25	1½	DFA46	2
JPA63	1	JPA105	1½	DFA15	1½	DFA26	2	DFA47	2½
JPA64	1¼	JPA106	2	DFA16	2	DFA27	2½	DFA48	3
JPA65	1½	–	–	–	–	–	–	–	–

Material – Cast aluminum, corrosion-resistant copper-free alloy, electrostatic epoxy coated. Furnished complete with gasket and screws.
To specify standard plugs or connectors equipped with one of the above adapters, add the catalog number of the adapter selected to the catalog number of the plug or connector. Complete list price is the list price of the device plus list price of the adapter.
Ex.: Cat. no. DS3107MP000 with adapter tapped 1 would be Cat. no. DS3107MP000/JPA63.

DSC6

DFC6

- For connectors, receptacles and interlocks.

Replacement flap covers and screw covers

Cat. no.	Description	Amperage
DFC3	Flap cover assembly (weathertight)	30
DFC6		60
DFC10		100
DFC20		200
DFC40		400
DSC3	Screw cap and STS – Lanyard assembly (watertight)	30
DSC6		60
DSC10		100
DSC20		200
DSC40		400

Max-Gard® interconnection systems

Accessories for receptacles

Accessories for receptacles

	Description	30 A Cat. no.	60 A Cat. no.	100 A Cat. no.	200 A Cat. no.	400 A Cat. no.
Cup caps						
	For watertight plugs/inlets. Cup caps are used where portable equipment is on a standby basis and plugs are not in use. Effectively protect insulation and contacts from excessive moisture, dirt, dust and corrosion. Material – Cast aluminum, corrosion-resistant copper-free alloy, electrostatic epoxy coated with steel braid cable attached.	DS3CC	DS6CC	DS1CC	DS2CC	DS4CC
Adapter flush frames – Single gang						
	Provide suitable means for mounting box covers of junction box receptacles flush in a wall.	JFA6	JFA10	JFA10	JFA20	–
Adapters for conduit box receptacles						
	Adapters to fit existing boxes and for special mounting requirements can also be furnished. Consult your ABB representative.					
	20° Vertical angle adapter	JAA6-AB6	JAA10	DAA10	DAA20	–
	30° Vertical angle adapter	–	–	–	–	DAA40
	45° Vertical angle adapter	JAA6-45	JAA10-45	–	–	–
	Straight adapter	JRA6-AB6	JRA10	DRA10	DRA20	DRA40
Junction box – Single gang						
		JB6-1	JB10-B150	JB10-B200	DJB20	DJB40
Angle enclosure						
		JE6	JE10	JE10M	–	–
MACK adapter plates						
	Enables mounting of Max-Gard receptacles to competitive existing back boxes. This involves removing the existing non-hazardous location receptacle from back box, inserting adapter plate and installing Max-Gard receptacle. Adapter plates are available for competitors' boxes including Hubbel, Killark, Appleton and Crouse-Hinds.	DCCA3	DCCA6	DCCA10	DCCA20	–
Russellstoll® adapter plates						
	Adapt Max-Gard receptacles to existing J-Line™, angle type and heavy-service Ever-Lok® back boxes.	DRCA3	DRCA6	DRCA10	–	–

Max-Gard® interconnection systems

Replacement interiors for receptacles, connectors, plugs and male inlets

Replacement interiors for receptacles, connectors, plugs and male inlets

Rating	Poles/ wires	Voltage polarization (V AC)	Corresponding male interior assembly		Corresponding female interior assembly	
			Plug/inlet	Male interior	Connector/receptacle*	Female interior
30 A	2P3W	125	DS3107MP000	DFPU3107	DF3107FP000	DFRU3107
	2P3W	250	DS3207MP000	DFPU3207	DF3207FP000	DFRU3207
	3P4W	125/250	DS3307MP000	DFPU3307	DF3307FP000	DFRU3307
	3P4W	3-ph 480	DS3404MP000	DFPU3404	DF3404FP000	DFRU3404
	4P5W	277/480	DS3504MP000	DFPU3504	DF3504FP000	DFRU3504
60 A	2P3W	250	DS6207MP000	DFPU6207	DF6207FP000	DFRU6207
	3P4W	125/250	DS6307MP000	DFPU6307	DF6307FP000	DFRU6307
	3P4W	3-ph 480	DS6404MP000	DFPU6404	DF6404FP000	DFRU6404
	4P5W	277/480	DS6504MP000	DFPU6504	DF6504FP000	DFRU6504
100 A	2P3W	250	DS1207MP000	DFPU1207	DF1207FP000	DFRU1207
	3P4W	125/250	DS1307MP000	DFPU1307	DF1307FP000	DFRU1307
	3P4W	3-ph 480	DS1404MP000	DFPU1404	DF1404FP000	DFRU1404
	4P5W	277/480	DS1504MP000	DFPU1504	DF1504FP000	DFRU1504
200 A	3P4W	277/480	DS2304MP000	DFPU2304	DF2304FP000	DFRU2304
	3P4W	3-ph 480	DS2404MP000	DFPU2404	DF2404FP000	DFRU2404
	4P5W	277/480	DS2504MP000	DFPU2504	DF2504FP000	DFRU2504
400 A	3P4W	277/480	DS4304MP000	DFPU4304	DF4304FP000	DFRU4304
	3P4W	3-ph 480	DS4404MP000	DFPU4404	DF4404FP000	DFRU4404
	4P5W	277/480	DS4504MP000	DFPU4504	DF4504FP000	DFRU4504

Note: For other interiors not shown, use same polarization index as plug, connector, etc. Ex: DS6416MP000 plug uses a DFPU6416 interior. If your original product had option "K - Control Contacts," include a "K" at the end of the replacement part number. Ex: If your plug/inlet is a DS3404MP00K, then the male replacement interior would be a DFPU3404K. If your connector/receptacle is a DF3404FP00K, then your female replacement/interior would be a DFRU3404K.
* To order replacement interior parts for the Max-Gard Interlock, replace "DFRU" with "DFIU".

Accessories for interlocked NEMA 12/3R receptacles

Accessories for interlocked NEMA 12/3R receptacles

Description	30 A Cat. no.	60 A Cat. no.	100 A Cat. no.	200 A Cat. no.	400 A Cat. no.
Fused disconnect interlocked receptacle with safety switch 30–100 A					
1 NO – 1 NC contact	F34757	F34757	F34757	–	–
2 NO – 2 NC contact	F34758	F34756B	–	–	–
Copper body lugs – 6 lugs per kit	F34756A	F34756B	F34756C	–	–
Type R fuse clips – 3 per kit	F34755A	F34755B	F34755C	–	–
Neutral block	F34754A	F34754B	F34754B	–	–

Max-Gard® interconnection systems

Pin and sleeve plugs, receptacles and systems

1.0 Scope

1.1 This document covers multi-contact pin and sleeve, industrial grade, arc-quenching, circuit interrupting-rated electrical plugs, motor plugs, connectors, receptacles, mechanically interlocked receptacles and assorted accessories. Usable in dry, damp, wet, marine and/or hazardous locations for electrical power circuits. Devices are to be rated 30, 60, 100, 200 and/or 400 amperes at 600 V AC, 50–400 Hz and 250 V DC maximum. Devices are also rated for continuous use in temperatures from -40 °C to +130 °C. These devices must provide internal environmental seals for marine and extreme wet applications and can be electrically interlocked.

1.2 The devices described shall be Thomas & Betts/Russellstoll® Max-Gard catalog numbers as specified.

2.0 Product classifications (features)

2.1 **Gated deadfront** – All receptacles and connectors must have a rotating disk on the face of the interior, which provides live contact isolation and environmental separation.

2.2 **Delayed action arc containment** – All devices upon disconnect under load shall have provision so the arc is contained and extinguished within the insulation cavity, making it impossible to withdraw a live plug.

2.3 **Flap cover or screw cover option** – Flap cover option must provide weathertight capability by utilizing a spring actuated self-closing flap. Watertight capability shall be obtained by using a gasketed screw cap.

2.4 **Polarization** – All devices shall be factory polarized for amperage, voltage, frequency and phase; thus providing a single voltage rating, single interface system.

2.5 **Grounding** – The grounding of the device shall be accomplished through a separate center ground (earth) make-first and break-last pole on all devices for complete system grounding.

2.6 **Pole capabilities** – All devices shall accommodate up to four power pins plus a separate center ground pin and they shall be integral with the connector bodies (five pins total).

2.7 **Interior type** – Interiors must be male (pin type) or female (sleeve type). Pins and sleeves shall also be self-aligning and self-wiping/self-cleaning.

2.8 **Control contacts** – All devices must have an option for two control contacts, which shall be make-last and break-first for use in electrical interlocks and/or control circuits. See table below.

2.9 **Conductor terminals** – Pin and sleeve connections shall employ solderless pressure-type screw terminals and be sized to accept stranded or solid copper conductors in AWG sizes (max. O.D.s as noted). The screw terminals shall also have socket heads to ensure proper torquing of wires.

2.10 **Environmental seals** – Each device must have an environmental seal or O-ring around all interiors and around each pin and sleeve to prevent water and contaminants from entering the wiring compartment. This provides waterproof capability, even when not mated.

2.11 **Hazardous location** – All standard plugs 30, 60 and 100 A shall be UL® and CSA listed for hazardous location class I division 1, groups C and D; class II division 1, groups F and G. A hazardous location circuit breaker-protected interlock shall also be applicable to the same environments and possess all the same product features as outlined above. Enclosures shall meet NEMA 8 hazardous outdoor-duty classifications and shall meet shipboard use above deck in accordance with the Department of Transportation (USCG “Green Water”).

Rating for pilot/control contacts

Thermal continuous current amps	Maximum current amps								Max. volt ampere	
	120 V		240 V		480 V		600 V			
	Make	Break	Make	Break	Make	Break	Make	Break	Make	Break
10 (#12 AWG)	60	6	30	3	15	1.5	12	1.2	7200	720

Contact rating code designation A-600, Table 119.1 – UL 508 heavy pilot duty load (720 VA/600 V AC) maximum

Max-Gard® interconnection systems

Pin and sleeve plugs, receptacles and systems

2.12 **Lockout devices –** Plug connection lockout is achieved by a padlock through plug sleeve housing hole provided for this purpose. On Hazardous location/explosion proof interlock receptacles, lockout shall additionally be achieved by separate lockout accessory available from the factory. On standard interlocks, lockout accessory/ construction is available from the factory.

3.0 Materials requirements

3.1 **Housings –** Plug, motor plug, receptacles, connectors and interlock housings, associated covers and caps, screw collars, and clamp holders shall be made of copper-free cast aluminum (max. 0.004% copper).

3.2 **Finish –** All external surfaces except those that provide means of grounding shall be epoxy powder coated to resist corrosion.

3.3 **Hardware –** All hardware, external and springs, shall be stainless steel. Cable clamps shall be stainless steel or epoxy powder coated, copper-free cast aluminum.

3.4 **Insulators –** All device body insulators shall be molded from glass-reinforced high-strength thermoset polyester, minimum of UL® 94-V0 flammability rated.

3.5 **Contacts –** Contacts base material shall be made of a conductive copper alloy (brass CDA485) to prevent dezincification. Accessory material of the contacts shall be made of a compatible corrosion resistant material.

3.6 **Environmental seals –** Environmental gaskets and O-rings shall be made of Neoprene material.

4.0 Design and construction requirements

4.1 **circuit interrupting rating –** All devices 30, 60, 100 and 200 A shall be tested to be interrupted at 150% of rated current. Additionally, all devices shall be designed and tested to interrupt 100% of rated current.

4.2 **Wiring –** All devices shall be wired from the rear requiring no disassembly of the pins and/or sleeves from the insulated body.

5.0 **Applicable documents (compliances)**

5.1 **Underwriters Laboratories (UL) –** The devices specified herein shall be listed in applicable sections of UL Standards 1010, 231, 1682 and 1686, File Nos. E2630, E57324, E68085, E123752.

5.2 **Canadian Standard Association (CSA) –** The devices specified shall be listed in the applicable sections of CSA C22.2-182.1, File Number LR14096.

5.3 **International Electro-Technical Commission (IEC) –** The 30-, 60- and 100 A devices specified shall have been tested and comply with IEC 309-1.

5.4 **Federal Department of Transportation –** Refrigerated National Shipboard location devices shall meet and comply with Federal Register volume 47, number 68, subpart 111.79.

5.5 **Standards –** The devices specified shall comply with Military Standards MIL-STD-105 and 1344; ASTM Standards D570 and D2565: NEMA Standard PR4-1983; and OSHA regulations when installed in accordance with the National Electrical Code® (NEC®).

5.6 NEMA 250 enclosures standard

NEMA 1 – General Purpose for indoor use; guards against contact with equipment.

NEMA 3R – Outdoor use primarily to protect against rain, sleet, wind-blown dust and damage from external ice formation.

NEMA 4 – Indoor or outdoor use to protect against windblown dust and rain; splashing and hose-directed water.

NEMA 4X – Watertight, dust-tight corrosion-resistant for indoor or outdoor applications.

NEMA 6 – Watertight, casual/ temporary immersion.

NEMA 7 – Class I (Hazardous) for indoor use in Class I areas, per NEC.

NEMA 8 – Class I (Hazardous) for indoor use in Class I, oil-immersed equipment.

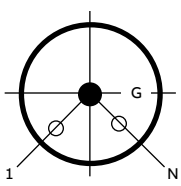
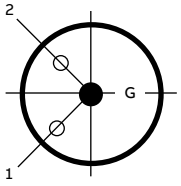
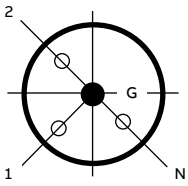
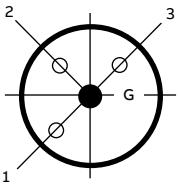
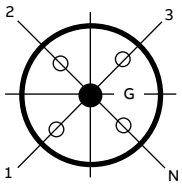
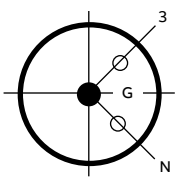
NEMA 9 – Class II (Hazardous) for indoor use in Class II areas, per NEC.

NEMA 12 – Industrial use, dust-tight for indoor use to protect against dust, falling dirt and dripping non-corrosive liquids.

Max-Gard® interconnection systems

Single polarization/multiple service* assigned voltages and wiring systems

Single polarization/multiple service* assigned voltages and wiring systems

N-R1-G		R1-S2-G		N-R1-S2-G		R1-S2-T3-G		N-R1-S2-T3-G		2P+G(DC)		
												
Voltage assign. no.	**Voltage**	**Voltage assign. no.**	**Voltage**	**Voltage assign. no.**	**Voltage**	**Voltage assign. no.**	**Voltage**	**Voltage assign. no.**	**Voltage**	**Voltage assign. no.**	**Voltage**	**Index**
101	220 V–50 Hz	**201**	380 V–50 Hz	**301**	220/380 V–50 Hz	**401**	380 V–50 Hz	**501**	220/380 V–50 Hz	–		01
103	127 V–50 Hz	**203**	220 V–50 Hz	**303**	220/127 V–50 Hz	**403**	220 V–50 Hz	**503**	220/127 V–50 Hz	–		03
104	277 V–60 Hz	**204**	480 V–60 Hz	**304**	277/480 V–60 Hz	**404**	3Ø 480 V–60 Hz	**504**	3ØY 277/480 V–60 Hz	–		04
105	250 V–50 Hz	**205**	440 V–50 Hz	**305**	250/440 V–50 Hz	**405**	3Ø 440 V–50 Hz	**505**	3Ø 250/440 V–50 Hz	–		05
107	125 V–60 Hz	**207**	250 V–60 Hz	**307**	125/250 V–60 Hz	**407**	3Ø 250 V–60 Hz	**507**	3ØY 125/250 V–60 Hz	–		07
108	220 V–60 Hz	**208**	380 V–60 Hz	**308**	220/380 V–60 Hz	**408**	3Ø 380 V–60 Hz	**508**	3Ø 220/380 V–60 Hz	–		08
109	100 V–60 Hz	**209**	220 V–60 Hz	**309**	100/220 V–60 Hz	**409**	3Ø 220 V–60 Hz	**509**	3Ø 100/220 V–60 Hz	–		09
111	115 V–400 Hz	**211**	220 V–400 Hz	**311**	220/115 V–400 Hz	**411**	220 V–400 Hz	**511**	220/115 V–400 Hz	–		11
	–		–		–	–	–	**513**	230 V DC	**613**	250 V DC	13
114	347 V–60 Hz	**214**	600 V–60 Hz	**314**	347/600 V–60 Hz	**414**	3Ø 600 V–60 Hz	**514**	3ØY 347/600 V–60 Hz	–		14
115	100 V–50 Hz	**215**	220 V–50 Hz	**315**	100/220 V–50 Hz	**415**	3Ø 220 V–50 Hz	**515**	3Ø 100/220 V–50 Hz	–		15
116	120 V–60 Hz	**216**	208 V–60 Hz	**316**	120/208 V–60 Hz	**416**	3Ø 208 V–60 Hz	**516**	3ØY 120/208 V–60 Hz	–		16
117	120 V–400 Hz	**217**	208 V–400 Hz	**317**	120/208 V–400 Hz	**417**	3Ø 208 V–400 Hz	**517**	3Ø 120/208 V–400 Hz	–		17
–	–	–	–	–	–	–	208 V		–	**618**	28 V DC	18
–		–	–	–	–	–	–		–	–		20
–	–	**221**	440 V–60 Hz	**321**	250/440 V–60 Hz	**421**	3Ø 440 V–60 Hz	**521**	3ØY 250/440 V–60 Hz	–		21
–	–	–	–	–	–	–	250 V		Reserved	–		22
–	–	–	–	–	–	–	480 V		Reserved	–		23
–	–	–	–	–	–	–	600 V		Reserved	–		24

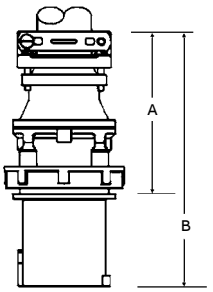
Max-Gard receptacles and plugs may be furnished in any of the above voltage and phasing systems.
To order any device in a voltage and phasing not shown in the preceding catalog pages, substitute the Voltage Assignment Number in the above chart for that portion of the listed catalog number appearing in boldface type.
Example: 200 A weathertight receptacle with flap cover, angle adapter and junction box for 3Ø 480 V (3-pole and ground) is DF2404FRAB0.
To change to 3Ø 208 V, the catalog number becomes DF2416FRAB0.
Note: All devices may be furnished with two control contacts. Add "K" to the end of the catalog number, in place of last position Ø.
* Dual-voltage or multiple-service applications (for any given polarization number) – Example: A factory installation may consist of all receptacles specified and wired at polarization 507. This is a 3-phase. Y–125/250 V–60 Hz supply. However, all circuit requirements "below" 507 ie 407,307,207 and 107 can also all be met. For instance, a 207 plug can draw power from a 507 receptacle. See chart above.
For non-interrupting polarizations at 45, 90, 150, 300, 600 A ratings, consult Technical Services.

Max-Gard® interconnection systems
Dimensions

Male plug

Amp	A (in.)	B (in.)
30	4¾	7⅞
60	5½	9⅛
100	6½	10⅛
200	9	13¾
400	12⅝	17⅝

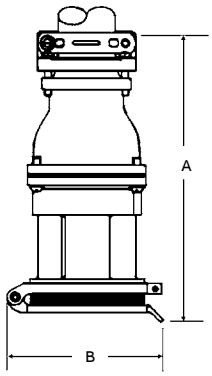
Dimensions*



Connector

Amp	A (in.)	B (in.)
30	8¾	5⅛
60	10	5⅜
100	11⅛	5⅜
200	15	9½
400	19⅛	10¾

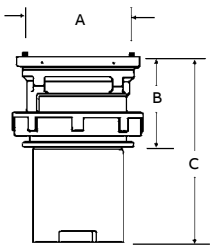
Dimensions*



Male inlet

Amp	A (in.)	B (in.)	C (in.)
30	2⅞	2½	5½
60	3⅜	2½	5½
100	3⅜	2½	5½
200	5¼	3½	9¼
400	3⅝	4⅜	9¼

Dimensions

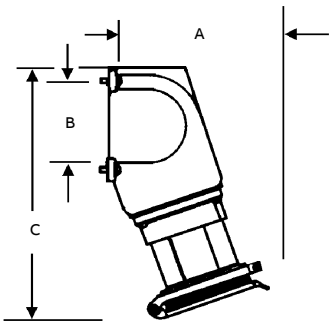


* Flap covers shown – Screw covers available. On all, screw covers have nominal effect on outside dimensions.

Receptacle with angle enclosure

Amp	A (in.)	B (in.)	C (in.)
30	6⅜	3⅛	9⅞
60	7⅛	4	11⅛
100	7½	4	11⅜
200	–	–	–
400	–	–	–

Dimensions



Max-Gard® interconnection systems
Dimensions

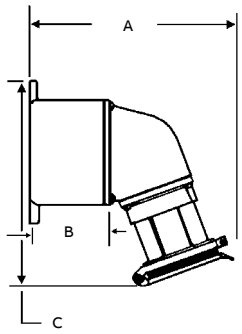
Receptacle with angle adapter and DJB junction box

	Dimensions (in.)		
Amp	**A (in.)**	**B (in.)**	**C (in.)**
30	9⅛	3	9⅝
60	10½	3	9¾
100	10¾	3¾	10
200	15¾	6⅝	14⅝
400	25¼	12	20¾

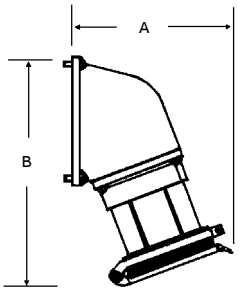
Receptacle with angle adapter

	Dimensions (in.)	
Amp	**A (in.)**	**B (in.)**
30	6⅛	9⅝
60	7½	9¾
100	7	10
200	9½	14¾
400	13¼	20¾

Dimensions*



Dimensions*

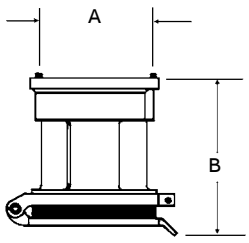


* Flap covers shown — screw covers available. On all, screw covers have nominal effect on outside dimensions.

Receptacle only

	Dimensions (in.)	
Amp	**A (in.)**	**B (in.)**
30	2⅞	4½
60	3⅜	5⅛
100	3⅝	5⅜
200	5¼	6⅝
400	7	7⅛

Dimensions



Max-Gard® interconnection systems

Industrial interlocked receptacles & sample installation

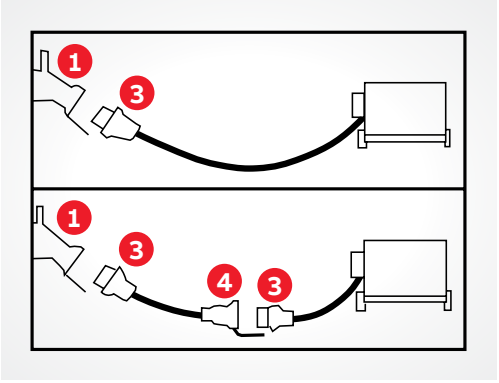
Industrial interlocked receptacles are available in 30 through 400 A. Switched receptacles have mechanical linkages for added safety. Safety features include:

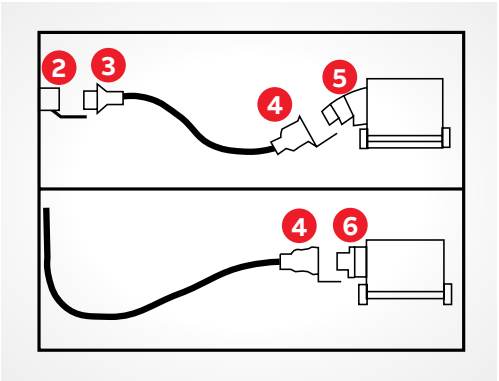
- Plugs cannot be inserted unless power is safely turned off
- Plugs cannot be removed until power is safely turned off
- Specialty designs may also automatically disengage power if plug is removed while power is on, either mechanically or electrically

Applications

Applications where these units are most commonly used are:

- Welding stations in automotive and heavy industry
- Temporary and portable power distribution for construction
- Marine shore-to-ship power
- Industrial machinery installation
- Portable power distribution, vehicle and gen-set power for aerospace
- Custom systems in all industries





Sample installation: Fixed power source (wall) to remote/portable location

1. Receptacle (wall-mounted female)
2. Receptacle (panel-mounted female)
3. Plug (attachment)
4. Female connector
5. Male Inlet with angle adapter
6. Male inlet with straight adapter

Other installations: generator power sources, custom control circuits, multiple voltage service — contact Technical Services.

Max-Gard® interconnection systems

Max-Gard fused-disconnect** interlocked receptacle with disconnect switch

Max-Gard fused-disconnect interlocked receptacle with safety switch meets UL®, NEC® and major automotive specifications. This unit is the maximum in:

Safety
- Door safety switch with three external lockout points
- Safety fuse pulls for standard class R fuses
- Backup door safety latch

Durability
- Heavy 0.060" steel galvaneel with baked enamel, NEMA 3R/12 construction
- Clear shield for test probes

Performance
- Standard 600 V cartridge fuse clips and spacing
- Fully interlocked Max-Gard receptacle
- Angled front receptacle for easier access

User made possible conduit hubs

Amp	Std. NPT thread outlet (in.)	Max. (in.)
30	1½	2½
60	2	2½
100	2	2½

Specifications on pages 38–39.

Ordering information

E5239

Amp	Poles/ wires	Voltage	Fused disconnect** interlocked receptacle NEMA 12/3R Cat. no. ▼	Mating Max-Gard plug Cat. no. ▼	Std. bushing I.D. (in.)
30	2P3W	125	DFRF3**1070**	DS3**107**MP000	⅞
	2P3W	250	DFRF3**2070**	DS3**207**MP000	⅞
	3P4W	3Ø250	DFRF3**3070**	DS3**307**MP000	1
	3P4W	3Ø480	DFRF3**4040**	DS3**404**MP000	1
	4P5W	277/480	DFRF3**5040**	DS3**504**MP000	1 3/16
60	2P3W	250	DFRF6**2070**	DS6**207**MP000	1 3/16
	3P4W	125/250	DFRF6**3070**	DS6**307**MP000	1 5/16
	3P4W	3Ø480	DFRF6**4040**	DS6**404**MP000	1 5/16
	4P5W	277/480	DFRF6**5040**	DS6**504**MP000	1½
100	2P3W	250	DFRF1**2070**	DS1**207**MP000	1 11/16
	3P4W	125/250	DFRF1**3070**	DS1**307**MP000	1 13/16
	3P4W	3Ø480	DFRF1**4040**	DS1**404**MP000	1 13/16
	4P5W	277/480	DFRF1**5040**	DS1**504**MP000	2

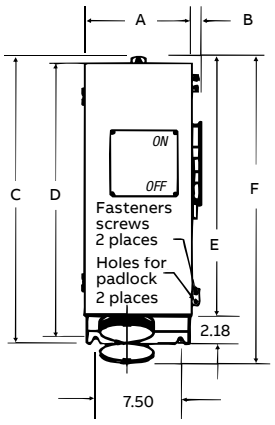
Maximum 600 V AC or 250 V DC
▼Control contacts (position 9) use "K" example: DFRF1207K.
Always use liquidtight fittings to limit condensation entry.
Notes: **Non-fused, non-UL version available:
Specify DNRF _____ .
Standard polarizations shown. Boldface figures are for voltage assignment; For different ratings, see page 38.

Dimensions

E5239

Amp	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)
30	9½	¾	25¾	25	22¾	30
60	9½	¾	25¾	25	22¾	30
100	9½	¾	25¾	25	22¾	30

Dimensions



Max-Gard® interconnection systems

Maximum 600 V AC/250 V DC

Max-Gard NEMA 4X interlocks are ideal for demanding non-hazardous areas where dust, dirt, moisture and corrosion might be a problem – such as shipyards, food processing facilities, manufacturing operations or similar areas.

Safety

- Gated deadfront waterproof receptacle
- Standard, high AIC or NA/switch circuit breaker
- Protective screw cap for watertight protection

Durability

- Thick-wall cast copper-free aluminum housing with epoxy powder-coat finish
- Heavy-duty sliding bar interlock mechanism

Performance

- Heavy on/off handle adds mechanical ability to electrical interlock function
- Standard conduit openings through top or side

Conduit hubs: (at B or E)

Amp	Std. NPT thread outlet (in.)	Max. (in.)
30	1½	2½
60	1½	2½
100	2	2½
200	2	3
400	4	4

Ordering information

Amp	Poles/ wires	Voltage	Mechanically interlocked receptacle NEMA 4X Cat. no. ▼	Mating Max-Gard plug Cat. no. ▼	Std. bushing I.D. (in.)
30	2P3W	125	DBRS3**107**03000	DS3**107**MP000	⅞
	2P3W	250	DBRS3**207**03000	DS3**207**MP000	⅞
	3P4W	3Ø250	DBRS3**307**03000	DS3**307**MP000	1
	3P4W	3Ø480	DBRS3**404**03000	DS3**404**MP000	1
	4P5W	277/480	DBRS3**504**03000	DS3**504**MP000	1 3/16
60	2P3W	250	DBRS6**207**06000	DS6**207**MP000	1 3/16
	3P4W	125/250	DBRS6**307**06000	DS6**307**MP000	1 5/16
	3P4W	3Ø480	DBRS6**404**06000	DS6**404**MP000	1 5/16
	4P5W	277/480	DBRS6**504**06000	DS6**504**MP000	1½
100	2P3W	250	DBRS1**207**10000	DS1**207**MP000	1 11/16
	3P4W	125/250	DBRS1**307**10000	DS1**307**MP000	1 13/16
	3P4W	3Ø480	DBRS1**404**10000	DS1**404**MP000	1 13/16
	4P5W	277/480	DBRS1**504**10000	DS1**504**MP000	2
200	3P4W	277/480	DBRS2**307**20000	DS2**307**MP000	1¼
	3P4W	3Ø480	DBRS2**404**20000	DS2**404**MP000	2¼
	4P5W	277/480	DBRS2**504**20000	DS2**504**MP000	2½
400	3P4W	277/480	DBRS4**307**40000	DS4**307**MP000	3
	3P4W	3Ø480	DBRS4**404**40000	DS4**404**MP000	3
	4P5W	277/480	DBRS4**504**40000	DS4**504**MP000	3¼

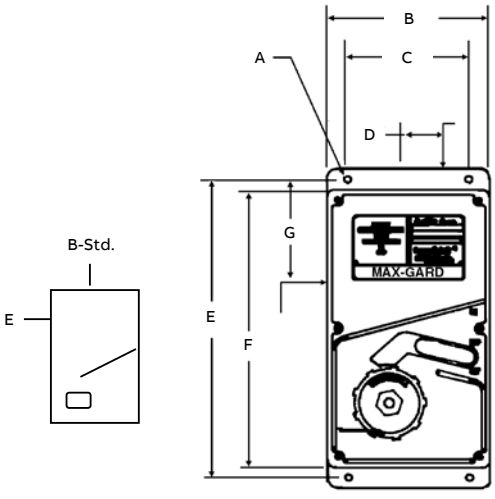
(Flap-cap available by replacing DBRS with DBRF)

▼Control contacts (position 12) use "K" example: DBRS6104060K0
Shunt trip breaker (position 13) add "Z" to above: DBRS6104060KZ
Breaker trip ratings (positions 9, 10, 11) 30 A use 030; 60 A use 060; alternate trip ratings available – Consult Technical Services
Non-Auto Sw. NA0 (repl." DBRF" with "DSRF")
For additional full line and polarization options, see page 38.
Boldface figures are for voltage assignment; For different ratings, see page 38.

Dimensions

Amp	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)
30	⅜	8¾	6½	1½	16¼	15⅛	3⅛
60	⅜	8¾	6½	1½	16¼	15⅛	3⅛
100	⅜	8¾	6½	1½	16¼	15⅛	3⅛
200	9/16	12¼	9	2½	26¼	24¾	5
400	9/16	15½	12	3	30½	29	6

Dimensions



Max-Gard® interconnection systems

Explosion-proof applications

Russellstoll® hazardous-duty plugs, receptacles and interlocks are designed to support a variety of installation needs throughout 20 A, 30 A, 60 A and 100 A ranges where division 1, class 1 NEC® guidelines require the utmost in safety.

Unique among others, the Russellstoll® Max-Gard also offers true O-ring sealed waterproof design protection in addition to standard threaded flame-path construction employed elsewhere. In rough service, washdown and outdoor applications, Max-Gard performance goes beyond normal explosion-proof ratings.

With coming increases in harmonized designations for classifications between NFPA/NEC® and IEC (international) hazardous area standards, a quick reference classification chart is provided below. In all cases, the customer must determine and approve proper area classification standards and degree of harmonized standards acceptance.

Explosion-proof applications

Hazardous materials environment	U.S. NEC standards	Euro IEC standards
Gas or vapor	Div. 1, Class I	Zone 0 and 1
	Div. 2, Class I	Zone 2
Dust	Div. 1, Class II	Zone 10
	Div. 2, Class II	Zone 11
Fibers/flyings	Div. 1, Class III	Zone 10
	Div. 2, Class III	Zone 11
Group applications	NEC Art. 500 Class I: groups	NEC Art. 505 Zones 0, 1 and 2
Div. 1 and 2, Class I	A: Acetylene	IIC
	B: Hydrogen	
	C: Ethylene	IIB
	D: Propane	IIA

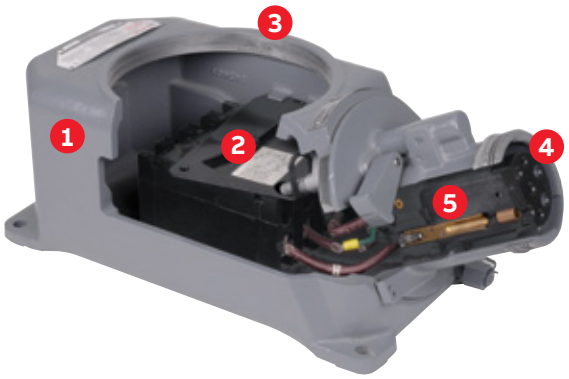
The above chart is presented for quick reference only and should only be used in conjunction with noted articles.
Further definition of harmonized standards will be supported by Russellstoll through appropriate specification efforts whenever practical.

Max-Gard® interconnection systems

Max-Gard DBRE and DSRE series interlocks are the only devices certified both explosion-proof and waterproof, along with optional control contacts, and are fully UL® listed.

01 Approvals
- UL and CSA listed for hazardous locations
- Class I, Division 1, Groups B, C and D
- Class II, Division 1, Groups F and G UL File E10919
- NEMA 7, 8, 9
- CSA
- DOT shipboard used above deck "green water"
- NEMA 4X
- USCG approved

02 Approvals
- UL and CSA listed for hazardous locations
- Class I, Division 1, C and D
- Class II, Division 1, Groups F and G
- UL File E10919
- NEMA 7, 8, 9
- CSA
- DOT shipboard used above deck "green water"
- NEMA 4X
- USCG approved



01

Explosion-proof waterproof circuit breaker interlocked receptacle

Available in 30 A, 60 A and 100 A sizes, all polarizations.

1. Heavy-duty cast aluminum housing, electrostatic epoxy coat finish
2. Standard, high AIC and NA (switched only) breakers available
3. Threaded access (cover not shown) with O-ring for explosion-proof and waterproof integrity
4. Gated deadfront safety
5. Drain plug
6. Factory-sealed receptacle interior – Accepts standard Max-Gard plugs

02

Explosion-proof waterproof non-interlocked receptacle

Available in 30 A 480 V AC max, all polarizations.
- Factory-sealed interior (no filled conduits)
- Easy low-cost installation

1. Heavy-duty cast aluminum housing, electrostatic epoxy coat finish
2. Threaded access (cover not shown) with O-ring for explosion-proof and waterproof integrity
3. Gated deadfront for safety
4. All standard polarizations available to 480 V AC
5. Factory-sealed receptacle interior – Accepts standard Max-Gard plugs

Max-Gard® interconnection systems

Maximum 600 V AC or 250 V DC

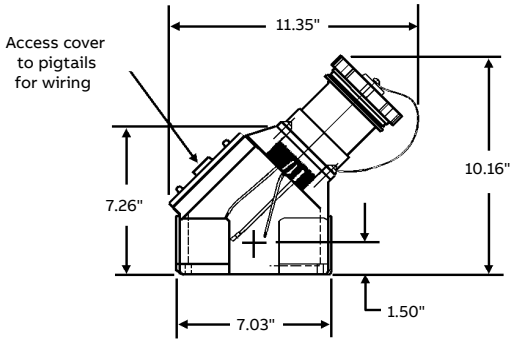
Explosion-proof applications

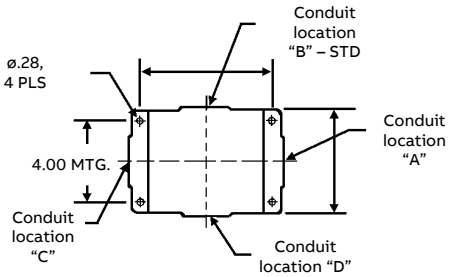
Amp	Poles/ wires	Voltage (V AC)	Cat. no. ▼	Cat. no. ▼	Cat. no. ▼	Std. bushing I.D.* (in.)
Product type			**Explosion-proof interlocked receptacle with circuit breaker, Class I, Class II**	**Explosion-proof receptacle, Class I, Class II**	**Male plug**	
30	2P3W	125	DBRE3**107**03000	DSE3**107**FR0	DS3**107**MP000	7/8
	2P3W	250	DBRE3**207**03000	DSE3**207**FR0	DS3**207**MP000	7/8
	3P4W	3Ø250	DBRE3**307**03000	DSE3**307**FR0	DS3**307**MP000	1
	3P4W	3Ø480	DBRE3**404**03000	DSE3**404**FR0	DS3**404**MP000	1
	4P5W	277/480	DBRE3**504**03000	DSE3**504**FR0	DS3**504**MP000	1 3/16
60	2P3W	250	DBRE6**207**06000	–	DS6**207**MP000	1 3/16
	3P4W	3Ø250	DBRE6**307**06000	–	DS6**307**MP000	1 5/16
	3P4W	3Ø480	DBRE6**404**06000	–	DS6**404**MP000	1 5/16
	4P5W	277/480	DBRE6**504**06000	–	DS6**504**MP000	1 1/2
100	2P3W	250	DBRE1**207**10000	–	DS1**207**MP000	1 11/16
	3P4W	3Ø250	DBRE1**307**10000	–	DS1**307**MP000	1 13/16
	3P4W	3Ø480	DBRE1**404**10000	–	DS1**404**MP000	1 13/16
	4P5W	277/480	DBRE1**504**10000	–	DS1**504**MP000	2

* For additional bushing sizes, accessories and specification information, see pages 32–37.
Note: For additional full line and polarization options, see page 40.
▼ Control contacts (position 12) use "K" example: DBRE6404060K0
Shunt trip breaker (position 13) add "Z" to above: DBRE6404060KZ
Breaker trip ratings (positions 9, 10, 11) 30 amp use 030;
60 A use 060; alternate trip ratings are available – Consult technical services
Non-auto Sw. NA0 (repl. "DBRE" with "DSRE")
Boldface figures are for voltage assignment; For different ratings, see page 38.

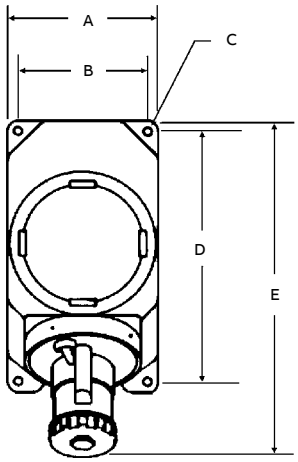
Max-Gard® interconnection systems
Dimensions

Explosion-proof receptacle



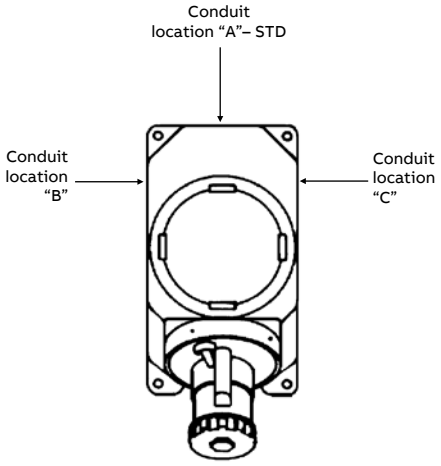


Bottom view
(possible conduit sizing are: 0.750–14 NPT, 1.00–11.5 NPT, 1.25–11.5 NPT with 1.00–11.5 NPT at location “B” as standard)



Explosion-proof interlocked receptacle

	Dimensions (in.)				
Amp	**A**	**B**	**C**	**D**	**E**
30	8¾	7½	½	14¾	20
60	8¾	7½	½	14¾	20
100	8¾	7½	½	14¾	20



Conduit sizing

Amp	Standard (in.)
30	1.25
60	1.50
100	2.00

Note: Range is 0.750–14 NPT through 2.00–11.5 NPT.

GSUL safe ground indicator system

Prevents operation of pumps without a safe ground for static dissipation.

Class I, Division 1, Groups C, D, and Zone 1, Groups IIB, IIA; NEMA 7 Class II, Division 1, Groups E, F, G; NEMA 9

01 Unit shown with covers removed

01

Applications

Volatile or classified areas such as:
- Tank farms
- Petrochem
- Cosmetics
- Grain mills
- Vehicular or rail transport

Specifications

Enclosure: Cast copper-free aluminum with epoxy powder-coated finish
Outlets: Regularly furnished tapped ¾" NPT
Relay Contacts: Rated 1/3 hp, 10 A, 120 V AC; 1/2 hp, 10 A, 240 V AC
Certifications: UL® listed, CSA certified

E33553

Instant visual confirmation of safe ground
The Russellstoll® GSUL safe ground indicator system is designed to ensure that a safe ground has been established for dissipating ever-present static electricity from tank vehicles, carriers, drums and other conductive equipment before allowing the transfer of flammable materials. The GSUL indicates the establishment of a safe ground via two parallel-connected green signal lights. Two lights are used for redundancy – If one lamp burns out, visual indication of safe grounding will be maintained by the other.

Intrinsically safe circuitry
The GSUL safe ground indicator system features an intrinsically safe, low-energy ground-sensing circuit, which does not carry sufficient electrical energy to cause ignition in classified hazardous locations.

In operation, the ground-sensing circuit extends through the grounding clamp and its connection to the ground indicator, the metal portion of the vehicle between the jaw terminals of the clamp and earth ground electrode.

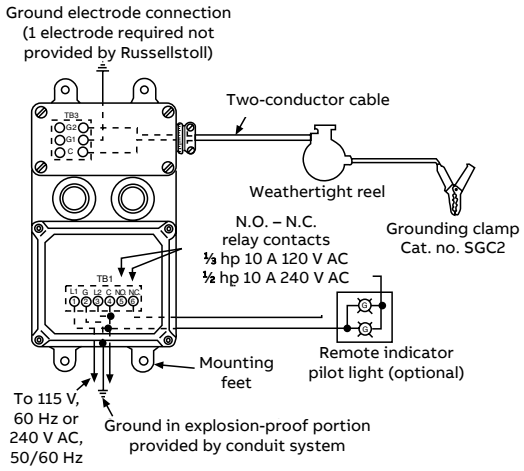
Pumps won't operate until safe ground is established
A control relay in the GSUL safe ground indicator system provides interlocked control of pump motors at the loading platform. The electronic control circuit will be de-energized while the green lights are off. Attaching the clamps to the tank closes the interlocking contact and energizes the control circuits to the motors.

—
01 Wiring diagram

—

GSUL safe operating features

- Two redundant, parallel green indicator lights glow when safe ground is established
- Lamps offer approximately 20,000 hours of operating life
- Unit may be ordered without lights where remote visual indication is desired Intrinsically safe, simplified circuitry
- Integral, intrinsically safe wiring compartment with approved strain-relief fitting for connection of cable from grounding clamp
- Solid-state actuating and control circuits mounted on removable printed circuit board
- Enclosure protects components against moisture
- Control relay provided for interlocked control of pump motor at loading rack
- Grounding clamp (ordered separately) provides dual isolated tip contacts in a heavy-duty cast-aluminum handle design



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01

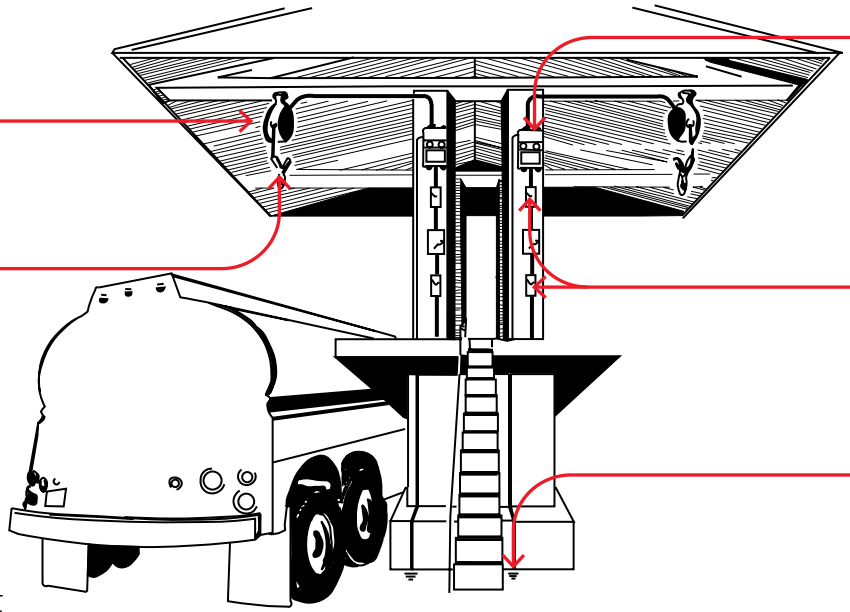
GSUL safe ground indicator system

Prevents operation of pumps without a safe ground for static dissipation.

01 Loading rack illustration suggests a typical installation, which includes an explosion-proof switch, explosion-proof sealing fittings, weathertight reel and the GSUL-2-SS safe ground indicator with 2-wire grounding clamp.

02 GCC1

Typical installation



01

Aerospace/industrial static ground devices
Static grounding receptacles are used in airport and aerospace installations worldwide during fueling, testing and maintenance procedures. Normal mounting is concrete/tarmac floor inset, threaded onto copper ground rod.

Heavy brass construction cup includes optional cover and receptacle's contact pin. Accommodates a wide variety of single-contact (copper on steel wire) static ground wire clamps in service.

02

Cat. no.	Description
GCC1	Ground cup with cover*
GC1	Ground cup without cover*
F06146	Replacement contact tip**

* Hub is tapped for ¾"–10.
** Hub is tapped for ½"–13.

GSUL safe ground indicator system

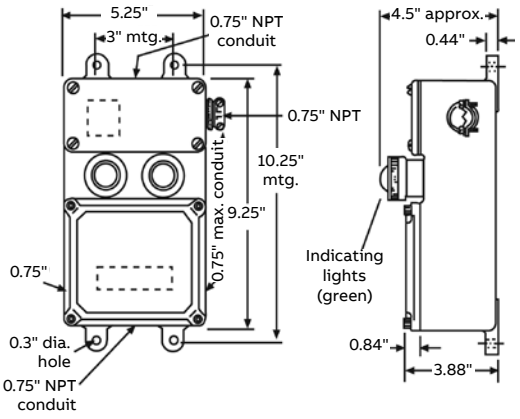
Maximum 600 V AC or 250 V DC

GSUL-2-SS

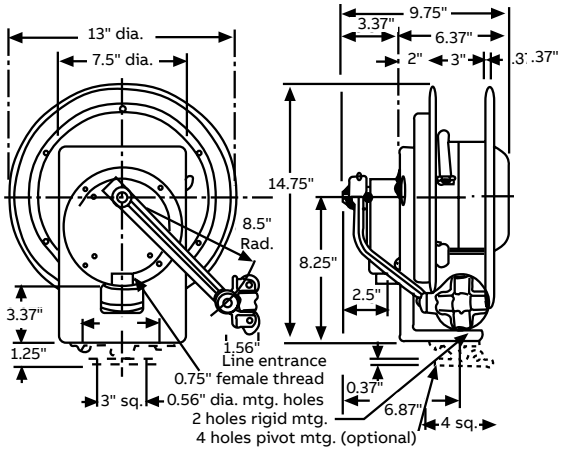
SGR25, SGR50, SGR75

SGC2

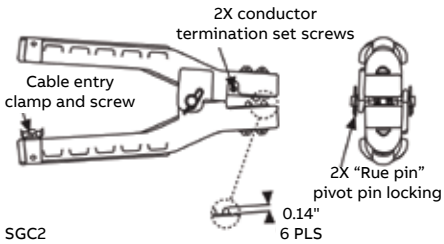
Maximum 600 V AC or 250 V DC



GSUL-2-SS



SGR25, SGR50, SGR75

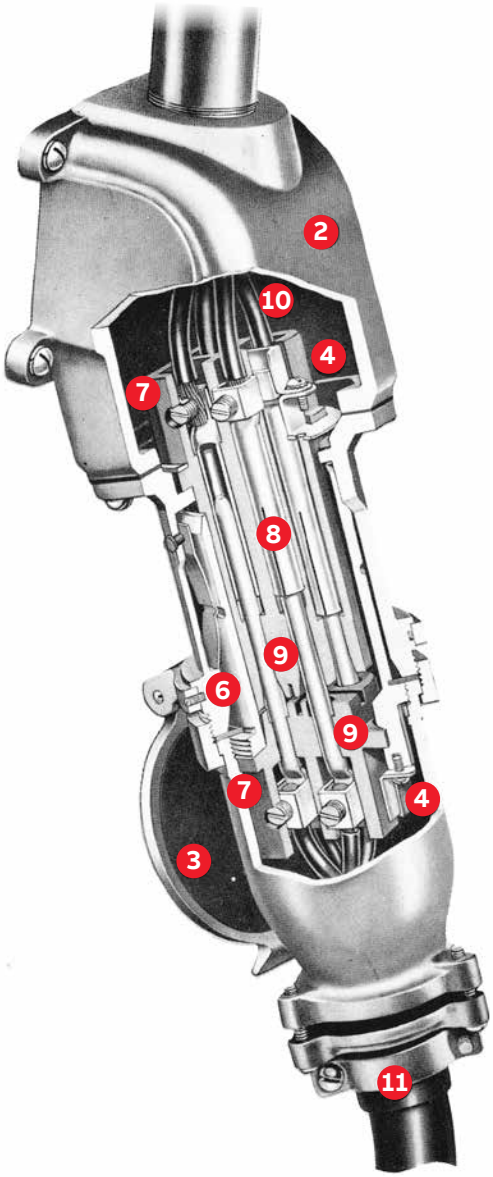


SGC2

Cat. no.	Description
GSUL2SS	Safe ground indicator with indicator lights, 120 V, UL®/CSA
GSUL2SS-240	Safe ground indicator with indicator lights, 240 V, CSA
SGC2	Safe ground static clamp
SGR25	Weathertight retracing reel with 25 ft. of 12/2 SJO-W cable
SGR50	Weathertight retracing reel with 50 ft. of 12/2 SJO-W cable
SGR75	Weathertight retracing reel with 75 ft. of 12/2 SJO-W cable
Replacement parts for GSUL	
C13662	Printed circuit board, 120 V (includes relay)
GX24RCB	Printed circuit board, 240 V (includes relay)
F30674	Control relay
F30602	Lamp socket assembly
ELAG	Pilot light globe assembly (green)
310993	Lamp for GSUL2SS
Replacement parts for SGC2	
GX2TK	Ground clamp repair kit

J-Line™ interconnection systems
J-Line 4P4W max. 30 through 200 A

Robust service in metal for many industrial applications, the J-Line offers a value alternative to Max-Gard® in 3P4W, 30–200 A applications with less severe needs. Unique among competitors, the J-Line™ uses a reversible contract carrier for maximum flexibility in many portable service applications.



Design features

Russellstoll® J-Line load-breaking plugs, connectors and receptacles

1. Circuit-interrupting rated safety
2. Cast aluminum, corrosion-resistant copper-free alloy housings and enclosures provide lightweight and maximum corrosion resistance, along with electrostatic epoxy powder coat finish
3. Quick conversion between weathertight flap cover and watertight screw cap assemblies. Basic receptacle housing accommodates both covers and is the basic component of all complete units. All watertight configured plugs may be used interchangeably
4. Two grounding arrangements (Style No. 1 and Style No. 2)
5. Four complete J-Lines: 30, 60, 100 and 200 A; 600 V AC/250 V DC (plus 150 A/270 A specials)
6. Flap cover can be rotated and locked in any convenient position
7. Pressure-type solderless wiring terminals
8. Silver-plated contacts
9. One-piece interior assemblies interchangeable from regular to reverse service in the field with a screwdriver
10. Wiring space ample for maximum requirements
11. Cable clamps adjustable for maximum range of cable size. Oil-resistant neoprene strain-relief bushing compresses around cable tightly, prevents entry of dust and moisture
12. Polarization provides positive non-interchangeability for different electrical systems
13. Reversed contacts flexibility: male–female reversed installation within any housing

Polarization

Devices offer standard and custom polarization for total operator safety so that plugs will fit only into receptacles or connectors having the same electrical/specification characteristics.

Visual means of aligning units for a specific, positive polarization are provided:

- Button inside of receptacle housing mates to groove on plug shroud
- Smaller primary guides also assist positive part-part mating
- External I.D. of 1 of 8 polarization indexes visible
- Different polarizations assigned to voltages can't mate – a safer system!

01 Weathertight J-Line™ with flap cover assembly

02 Watertight J-Line with screw cap

01

02

Conversion to weathertight and watertight types

Substitution of either the flap cover assembly or the screw cap assembly on the housing of the basic receptacle permits quick and easy conversion between the weathertight and watertight types. Only a small screwdriver is needed to change in the field.

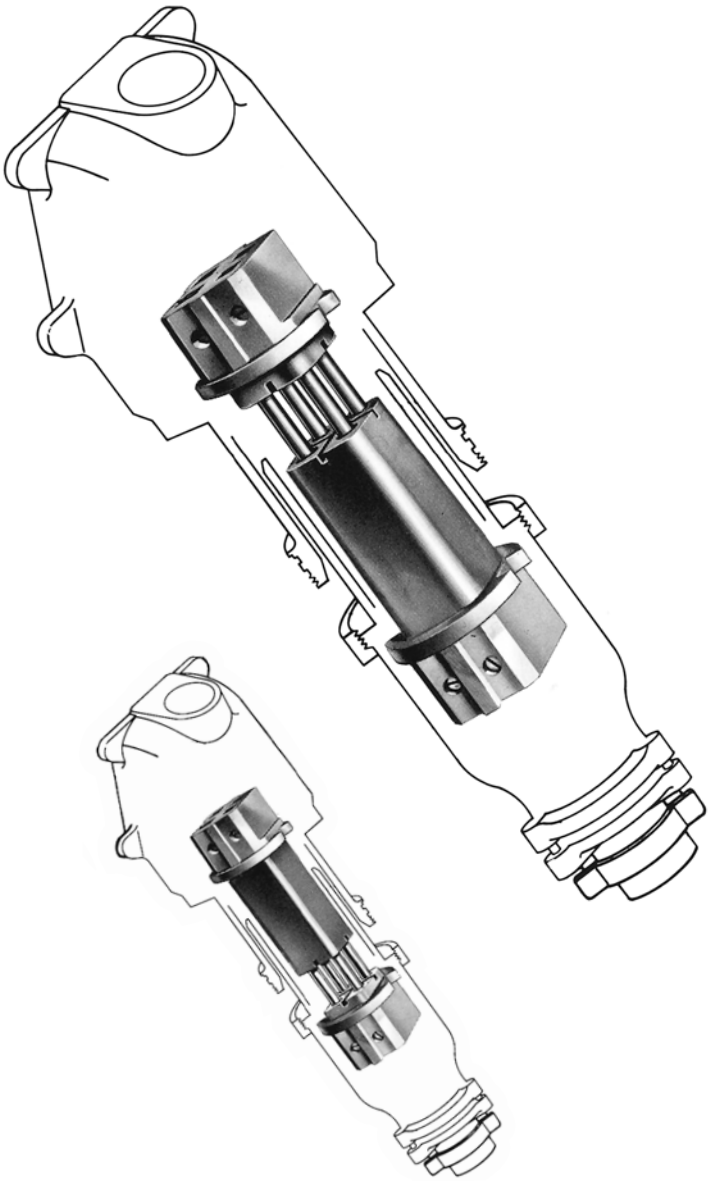
The basic receptacle housing is constructed with a threaded end to accommodate a screw cap or the collar nut of a watertight plug. A special groove above the threads accommodates the flap cover assembly. The flap cover assembly may be rotated around this grooved shell and the set-screw locked in any convenient position.

The watertight plug, with its collar screwed firmly to the basic receptacle shell, forms a completely watertight connection on either type of receptacle assembly.

These conversion features also permit the use of flap cover or screw cap on connector housings.

J-Line™ interconnection systems
For all weathertight and watertight types

30–200/270 A (30–200 A load breaking), maximum 600 V AC/250 V DC load-breaking receptacles, plugs, connectors and inlets



Reversed contacts service

All J-Line plugs, receptacles and connectors can be furnished for reverse service – male (plug) interiors in the receptacles and female (receptacle) interiors in the plugs. When ordering reverse service, add a final suffix “R” to the complete catalog number. Price on request.

Example: JRFA334HR

J-Line receptacle and plug interior assemblies of the same amperage may be quickly interchanged from regular to reverse service (or vice versa) in the field. A screwdriver is the only tool required.

Example: Panel-mounted low-profile receptacles with male interiors act as male inlets in remote equipment; receive power from female plugs. (Cup cap also recommended.)

Regular service
Interior assemblies placed in normal, standard positions – female interior assembly is positioned in the receptacle housing and the male interior assembly is positioned in the plug housing.

Reversed service
Note the complete interior assemblies have now been interchanged so that the male (plug) interior assembly is positioned in the receptacle housing and the female (receptacle) interior assembly is positioned in the plug housing.

—
01 Style 1 — Typical 3P3W plug and receptacle
—
02 Style 2 — Typical 3P4W plug and receptacle

—

Grounding data

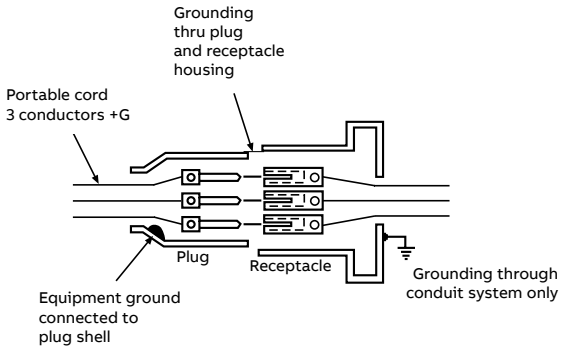
Effective grounding of portable electrical equipment is necessary to protect operators from electric shock. The National Electrical Code® requires that in most cases, exposed non-current-carrying metal parts of portable equipment shall be grounded if operated at more than 150 V to ground. Grounding must be used in other than residential occupancies when used in damp or wet locations, or by persons standing on the ground or on metal floors or working inside of metal tanks or boilers, except where supplied through an insulating transformer with ungrounded secondary of not over 50 V.

Plugs and receptacles provide for grounding of portable equipment in either of two ways:

—

Corrosive locations

The National Electrical Code® requires that under conditions favorable to corrosion, the grounding conductor for enclosures and equipment be of copper or other corrosion-resistant material. In alternating current systems, this necessitates running another conductor back to the common grounding electrode. This may be run through the conduit containing the circuit conductors. At the receptacle, this grounding conductor should be connected to the extra (grounding) pole by the pressure connector provided for that purpose. Where such an extra grounding conductor is required, Style 2 receptacles should be used.



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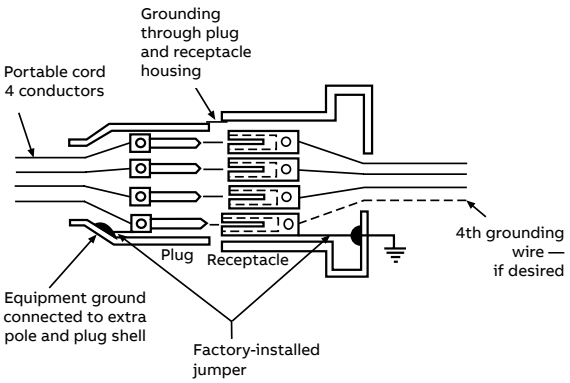

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02

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Style 1

4P4W (or 3P3W) through metal housings of plug and receptacle

In this system shown **above**, the equipment grounding conductor in the flexible cable is electrically connected directly to the plug or cable connector housing by a suitable terminal. The receptacle is grounded by being part of a grounded conduit system.

When inserted, the plug housing makes contact with the grounded receptacle or connector housing by means of the receptacle ground spring before the current-carrying contacts engage. On withdrawal, it remains in contact until after the current-carrying contacts disengage.

—

Style 2

3P4W (or 2P3W) through a separate grounding pole in plug and receptacle

In this system shown **above**, the equipment grounding conductor in the flexible cable is electrically connected to the equipment grounding pole in the plug or cable connector interior. The grounding pole of the receptacle interior is electrically connected by a spring-strap jumper to the receptacle housing, which itself is grounded by being part of the ground spring of the receptacle or connector housing as described in Style 1.

The grounding contact in a type 2 receptacle is longer than the current-carrying contacts so that the ground connection makes first and breaks last.

NEC and National Electrical Code are registered trademarks of the National Fire Protection Association, Inc.

J-Line™ interconnection systems

Plugs, connectors & receptacles

(All plugs come with watertight screw collar)

Max. 600 V AC/250 V DC

Current rating	Weathertight/watertight	Configuration	Plug
			● ●
30 A	Weathertight (spring hinged flap cover)	2P3W	JPS323H __
		3P3W*	JPS333F
		3P4W	JPS334H
		4P4W*	JPS344F
	Watertight (screw cover)	2P3W	JPS323H
		3P3W*	JPS333F
		3P4W	JPS334H
		4P4W*	JPS344F
60 A	Weathertight (spring hinged flap cover)	2P3W	JPS623H
		3P3W*	JPS633F
		3P4W	JPS634H
		4P4W*	JPS644F
	Watertight (screw cover)	2P3W	JPS623H
		3P3W*	JPS633F
		3P4W	JPS634H
		4P4W*	JPS644F
100 A (150 A)**	Weathertight (spring hinged flap cover)	2P3W	JPS1023H
		3P3W*	JPS1033F
		3P4W	JPS1034H
		4P4W*	JPS1044F
	Watertight (screw cover)	2P3W	JPS1023H
		3P3W*	JPS1033F
		3P4W	JPS1034H
		4P4W*	JPS1044F
200 A (270 A)**	Weathertight (spring hinged flap cover)	2P3W	JPS2023H
		3P3W*	JPS2033F
		3P4W	JPS2034H
		4P4W*	JPS2044F
	Watertight (screw cover)	2P3W	JPS2023H
		3P3W*	JPS2033F
		3P4W	JPS2034H
		4P4W*	JPS2044F

* Housing ground only (Style 1 grounding), see page 55.
\+ Shown with 20° angle adapter. Can be furnished with 45° angle at same price. When ordering, add suffix -45 to catalog number.
** Special rated devices (not shown). Consult Customer Service for details.
Note: To order reverse service, add a final suffix "R" to catalog number. Example: JRFA334HR – a receptacle housing with male interior.
● Polarization index (std. shown); consult Technical Services for more information.
● Flap cover "F" noted. Screw cover "S" also available.
● For reversed contacts, use "R" suffix to any catalog number.

Std. cable bushing

Current rating (A)	Bushing I.D. (in.)	Max. AWG size
30	⅞	**#6** 7-strand or **#8** flexible
60	1 3/16	**#4** 7-strand or flexible
100	1½	**#10** 19-strand or **#1** flexible
200	2	**4/0** 19-strand or flexible

See page 63 for other bushings

- 30–270 A (30, 60, 100 and 200 A load-breaking, 150 and 270 A special service), maximum 600 V AC/250 V DC receptacles, plugs, connectors and inlets
- For any J-Line™ catalog numbers not shown here, check page 58 for “series” information. For special polarizations (suffixes), contact Technical Services.



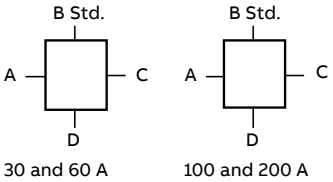

Connector	Panel mount connector	Basic receptacle	Standard series receptacle*
JCF323H __	JRFX323H __	JRF323H __	JRFA323H __
JCF333F	JRFX333F	JRF333F	JRFA333F
JCF334H	JRFX334H	JRF334H	JRFA334H
JCF344F	JRFX344F	JRF344F	JRFA344F
JCS323H	JRSX323H	JRS323H	JRSA323H
JCS333F	JRSX333F	JRS333F	JRSA333F
JCS334H	JRSX334H	JRS334H	JRSA334H
JCS344F	JRSX344F	JRS344F	JRSA344F
JCF623H	JRFX623H	JRF623H	JRFA623H
JCF633F	JRFX633F	JRF633F	JRFA633F
JCF634H	JRFX634H	JRF634H	JRFA634H
JCF644F	JRFX644F	JRF644F	JRFA644F
JCS623H	JRSX623H	JRS623H	JRSA623H
JCS633F	JRSX633F	JRS633F	JRSA633F
JCS634H	JRSX634H	JRS634H	JRSA634H
JCS644F	JRSX644F	JRS644F	JRSA644F
JCF1023H	JRFX1023H	JRF1023H	JRFA1023H
JCF1033F	JRFX1033F	JRF1033F	JRFA1033F
JCF1034H	JRFX1034H	JRF1034H	JRFA1034H
JCF1044F	JRFX1044F	JRF1044F	JRFA1044F
JCS1023H	JRSX1023H	JRS1023H	JRSA1023H
JCS1033F	JRSX1033F	JRS1033F	JRSA1033F
JCS1034H	JRSX1034H	JRS1034H	JRSA1034H
JCS1044F	JRSX1044F	JRS1044F	JRSA1044F
JCF2023H	JRFX2023H	JRF2023H	JRFA2023H
JCF2033F	JRFX2033F	JRF2033F	JRFA2033F
JCF2034H	JRFX2034H	JRF2034H	JRFA2034H
JCF2044F	JRFX2044F	JRF2044F	JRFA2044F
JCS2023H	JRSX2023H	JRS2023H	JRSA2023H
JCS2033F	JRSX2033F	JRS2033F	JRSA2033F
JCS2034H	JRSX2034H	JRS2034H	JRSA2034H
JCS2044F	JRSX2044F	JRS2044F	JRSA2044F

Conduit size (using JPA_ series conduit adapters)

Current rating (A)	Bushing I.D. (in.)	Max. conduit size (in.)
30	1	1¼
60	1½	1½
100	2	2
200	3	3

* Smaller NPT openings available on request.
Cable Conduit Adapters, see page 64.

Conduit entry location: Standard series



J-Line™ interconnection Systems

Receptacle mounting options – J-Line construction

- 30–200/270 A (30–200 A Load Breaking), maximum 600 V AC/250 V DC
- Load-breaking receptacles, plugs, connectors and inlets

Progressive assembly

Mounting style	To order use:	Current rating 30 A	60 A	100/150 A	200/270 A
Standard series **JRFA/JRSA** ●    	Receptacle + Vertical or square mount box + Angle adapter	Basic receptacle* + JB3-B100 1" Std. conduit size + JAA3 (20°) or JAA3-45 (45°)	Basic receptacle* + JB6-B150 1½" Std. conduit size + JAA6-AB6 (20°) or JAA6-45 (45°)	Basic receptacle* + JB10-B200 2" Std. conduit size + JAA10 (20°) or JAA10-45 (45°)	Basic receptacle* + JB20 3" Std. conduit size + JAA20 (20°) or JAA20-45 (45°)
Series **JRFR/JRSR** ● straight    	Receptacle + Vertical mount box + Straight adapter	Basic receptacle* + JB3-B100 1" Std. conduit size + JRA3	Basic receptacle* + JB6-B150 1½" Std. conduit size + JRA6-AB6	Basic receptacle* + JB10-B200 2" Std. conduit size + JRA10	Basic receptacle* + JB20 2½" Std. conduit size + JRA20
Series **JRFB/JRSB** ●   	Receptacle + 30° angle adapter	Basic receptacle* + JAAB3	Basic receptacle* + JAAB6	Basic receptacle* + JAAB10	Basic receptacle* + JAAB20
Series **JRFE/JRSE** ●   	Receptacle + Angle enclosure	Basic receptacle* + JE3 1" Std. conduit size	Basic receptacle* + JE6 1½" Std. conduit size	Basic receptacle* + JE10 2" Std. conduit size	N/A
Series **JRFH/JRSH** ● horizontal    	Receptacle + Horizontal mount box + Angle adapter	Basic receptacle* + JB3-B100 1" Std. conduit size + JAA10 (20°)	N/A	N/A	N/A

* Select appropriate receptacle by rating, configuration and voltage on pages 56–57

● Note: JRXX 3rd letter denotes flap (F) or screw (S) cover.

EX: JRSA – Screw cover

JRFA – Flap cover

JRF – Flap cover, basic receptacle

JRS – Screw cover, basic receptacle

J-Line™ interconnection systems

Plugs and connectors & basic receptacles

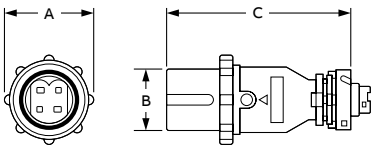
- 30–200/270 A (30–200 A load breaking), maximum 600 V AC/250 V DC
- Load-breaking receptacles, plugs, connectors and inlets

Plugs and connectors — Dimensions for 2-, 3- or 4-wire weathertight and watertight units

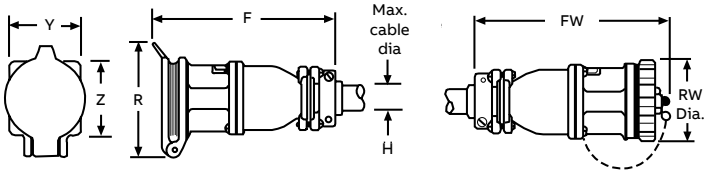
Amp	A (in.)	B (in.)	C (in.)	Weathertight F (in.)	Watertight FW (in.)	Weathertight R (in.)	Watertight RW (in.)	Y (in.)	Z (in.)	H (in.)
30	3	2 1/8	7	8 1/8	8 3/8	4 1/4	3	2 3/4	2 3/4	1
60	3 3/4	2 9/16	8 7/8	10 3/4	10 3/8	5	3 3/4	3 1/2	3 1/2	3 3/8
100/150	4 1/8	2 13/16	10 1/4	10 1/2	10 7/8	5 1/4	4 1/8	4	4	1 7/8
200/270	5 3/4	3 15/16	14 5/8	14 7/8	15 3/8	7 1/8	5 3/4	5 5/8	5 5/8	2 1/2

Dimensions

Watertight male – plug



Female – connector



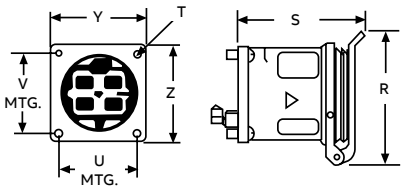
Weathertight

Watertight

Basic Receptacles – Dimensions for 2-, 3- or 4-wire units

Amp	Z (in.)	Y (in.)	X (in.)	Weathertight S (in.)	Watertight SW (in.)	Weathertight R (in.)	Watertight RW (in.)	V (in.)	U (in.)	T (in.)
30	2 3/4	2 3/4	1	3 3/8	3 3/4	4 1/4	3	2 1/4	2 1/4	1/4
60	3 1/2	3 1/2	1 1/4	4 5/8	4 3/4	5	3 3/4	2 7/8	2 7/8	9/32
100/150	4	4	1 1/4	5	5 1/4	5 1/4	4 1/8	3 3/8	3 3/8	9/32
200/270	5 5/8	5 5/8	1 3/4	6 1/8	6 3/8	7 1/8	5 3/4	4 7/8	4 7/8	11/32

Dimensions



J-Line™ interconnection systems

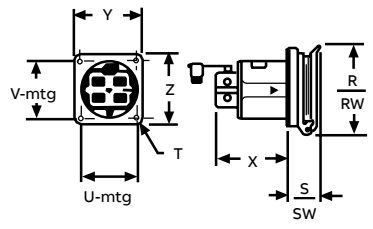
Receptacle mounting options – J-Line construction

Progressive assembly

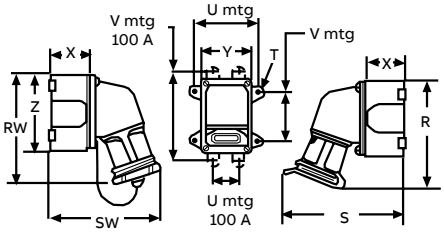
Amp	Series	Z (in.)	Y (in.)	X (in.)	Weathertight S (in.)	Weathertight SW (in.)	Weathertight R* (in.)	Weathertight RW† (in.)	Q (in.)	P (in.)	V (in.)	U (in.)	T (in.)	Panel opening
30	Panel mount	3½	3½	2 9/16	1¾	2	4¼	3	–	–	2⅞	2⅞	¼	2¾
	Standard (20°)	4½	3	2⅛	7	6½	6¾	6¾	–	–	2 11/16	3 11/16	¼	–
	JRFR/JRSR	4½	3	2⅛	6⅛	6½	–	–	–	–	2 11/16	3 11/16	¼	–
	JRFB/JRSB	3⅛	3⅛	–	5¾	5¾	–	–	–	–	21/4	2¼	¼	2¼
	JRFE/JRSE	–	3½	–	5¼	4⅝	7⅛	7⅛	1¼	2⅜	–	4	¼	–
	JRFH/JRSH	3 5/16	4½	2⅛	7	6½	6⅝	6⅝	–	–	2 11/16	3 11/16	¼	–
60	Panel mount	4	4	3⅞	1¾	2	5	3¾	–	–	3⅜	3⅜	9/32	3¼
	Standard (20°)	5⅝	4	3	9¼	8⅝	8⅞	9	–	–	3 13/16	4 13/16	11/32	–
	JRFR/JRSR	5⅝	4	3	8⅜	8½	–	–	–	–	3 13/16	4 15/16	11/32	–
	JRFB/JRSB	3 3/16	3⅝	–	7⅜	7⅜	–	–	–	–	2 3/16	2⅝	9/32	2½
	JRFE/JRSE	–	4¼	–	6⅜	5¾	9¾	9½	1 9/16	3 11/16	3⅛	4½	9/32	–
100/150	Panel mount	4¼	4¼	4 7/16	1¾	2	5¼	4⅛	–	–	3⅝	3⅝	9/32	3½
	Standard (20°)	5½	5½	3½	10½	9⅞	9⅞	9¾	–	–	6¾	4¼	11/32	–
	JRFR/JRSR	5½	5½	3½	11¼	11⅞	–	–	–	–	6¾	4¼	11/32	–
	JRFB/JRSB	3 3/16	3⅝	–	8¼	8¼	–	–	–	–	2 3/16	2⅝	9/32	–
200/270	Panel mount	6	6	5⅞	2	2½	7⅛	5¾	–	–	5¼	5¼	11/32	5⅛
	Standard (20°)	8 5/16	8 5/16	6 5/16	15⅞	15⅝	12 11/16	12 5/16	–	–	9⅝	7⅛	⅜	–
	JRFR/JRSR	8 5/16	8 5/16	6 5/16	15	15½	–	–	–	–	9⅝	7⅛	⅜	–
	JRFB/JRSB	4	4	–	12¼	12¼	–	–	–	–	2¾	2¾	11/32	–

Note: U = horizontal mounting hole centers; V = vertical mounting hole centers.
* = Flap cap.
† = Screen cap.

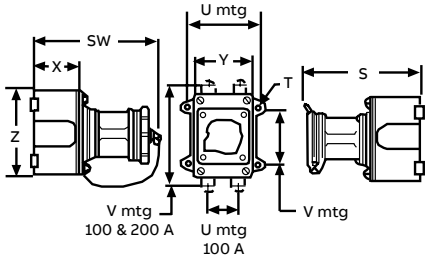
Dimensions



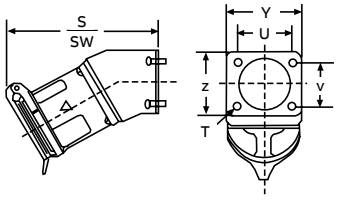
Panel mount series



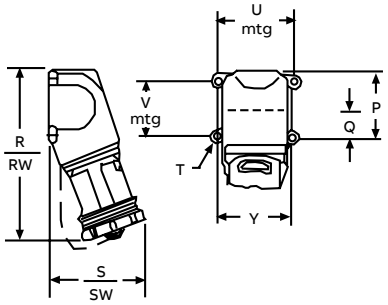
Standard series JRFA/JRSA



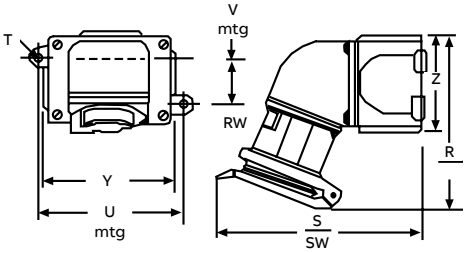
Series JRFR/JRSR



Series JRFB/JRSB



Series JRFE/JRSE



Series JRFH/HRSH

J-Line™ interconnection systems

Replacement interiors for receptacles, connectors, plugs and male inlets

Replacement interiors for receptacles, connectors, plugs and male inlets

	Female interiors: receptacles and connectors cat. nos.				Male interiors: plug and male inlets cat. nos.			
Poles/wires	**30 A**	**60 A**	**100/150 A**	**200/270 A**	**30 A**	**60 A**	**100/150 A**	**200/270 A**
2P2W+	JRU322	JRU622	JRU1022	JRU2022	JPU322	JPU622	JPU1022	JPU2022
2P3W	JRU323	JRU623	JRU1023	JRU2023	JPU323	JPU623	JPU1023	JPU2023
3P3W*	JRU333	JRU633	JRU1033	JRU2033	JPU333	JPU633	JPU1033	JPU2033
3P4W	JRU334	JRU634	JRU1034	JRU2034	JPU334	JPU634	JPU1034	JPU2034
4P4W*	JRU344	JRU644	JRU1044	JRU2044	JPU344	JPU644	JPU1044	JPU2044

* Includes equipment grounding lug for attachment to enclosure.
+ For replacement only – Includes equipment grounding lug.
Material – Molded composition with silvered copper contacts.

J-Line™ interconnection systems

Cup caps for watertight (series JPS) plugs – Standard or reverse service

Cup caps for watertight (series JPS) plugs – Standard or reverse service

Cat. no.	Amps
F30717A	30
F30718A	60
F30814A	100
F30815A	200

Cup caps are used:
* Where portable equipment is on a standby basis and plugs are not in use.
* To effectively protect insulation and contacts from excessive moisture, dirt, dust and corrosion.

Material – Cast aluminum, corrosion-resistant copper-free alloy, electrostatic epoxy coated with steel braid cable attached.

J-Line™ interconnection systems

Cable bushings for J-Line plugs and connectors

01 Standard cable Bushings – Size no. 3, 6, 10 and 20

02 Oversize cable Bushings – Size no. 3, 6, 10 and 20

01

02

Replacement interiors for receptacles, connectors, plugs and male inlets

Hole diameter for cable (in.)	Size 3 30 A	Size 6 60 A	Size 10 100/150 A	Size 20 200/270 A
0.375	JG31	–	–	–
0.500	JG32	–	–	–
0.563	JG325	–	–	–
0.594	JG32B	–	–	–
0.625	JG33	JG63	–	–
0.750	JG34	JG64	JG104	–
0.781	JG341	–	–	–
0.875	**JG35**	JG65	JG105	–
0.938	JG355	–	–	–
1.000	JG36*	JG66	JG106	JG206
1.125	JG361*	–	–	–
1.188	–	**JG67**	JG107	JG207
1.313	–	–	JG108	JG208
1.375	–	JG69*	–	–
1.500	–	JG610*	**JG1010**	JG2010
1.688	–	–	JG1011	JG2011
1.813	–	–	–	JG2012
1.875	–	–	JG1013*	–
2.000	–	–	–	**JG2014**
2.125	–	–	–	JG2015
2.500	–	–	–	JG2016*

Notes: Boxed numbers denote standard bushing size supplied.
When ordering, select bushing size slightly larger than your cable O.D. for best fit.
Material – Neoprene.
Identification letter inside hole.
Boxed catalog numbers are standard bushing sizes.
To order non-standard bushing, specify as follows: example JPS634H/JG65.

J-Line™ interconnection systems

Adapters for conduit and fittings for use on J-Line plugs and connectors

01 JPA62 Conduit adapter (replaces cable gland assembly)

02 JPA106 Conduit adapter

01

02

Plug or connector sizes

30 A Cat. no.	Tapped hole size NPT (in.)	60 A Cat. no.	Tapped hole size NPT (in.)	100/150 A Cat. no.	Tapped hole size NPT (in.)	200/270 A Cat. no.	Tapped hole size NPT (in.)
JPA31	½	JPA62	¾	JPA104	1¼	JPA205	1½
JPA32	¾	JPA63	1	JPA105	1½	JPA206	2
JPA33	1	JPA64	1¼*	JPA106	2	JPA207	2½

* JPA65 at 1½" also available.

Notes: Material – Cast aluminum, corrosion-resistant copper-free alloy, electrostatic epoxy coated.
Furnished complete with gasket and screws.
To specify standard plugs or connectors equipped with one of the above adapters, add the catalog number of the adapter selected to the catalog number of the plug or connector.
Complete list price is the list price of the device plus list price of the adapter.
Adapters are tapped NPT standard pipe thread to accommodate rigid conduit or standard connectors for armored and non-metallic cable or flexible conduit.
Example: Cat. no. JPS634H with adapter tapped 1" would be Cat. no. JPS634H/JPA63.

J-Line™ interconnection systems

Covers

Covers

	Cat. no.	Description	Amps
For connectors and receptacles			
	JFC3	Flap cover assembly (weathertight)	30
	JFC6		60
	JFC10		100/150
	JFC20		200/270
	JSC3	Screw cap and braid cable assembly (watertight)	30
	JSC6		60
	JSC10		100/150
	JSC20		200/270
For plugs			
	JSN3	Plug collar	30
	JSN6		60
	JSN10		100/150
	JSN20		200/270

DuraGard® waterproof connections
Features and benefits

Non-metallic plugs, connectors, receptacles and inlets – 20, 30, 50 and 60 A, maximum 600 V AC/250 V DC

Safety

- **Truly waterproof:** Not just watertight, but waterproof (tested under 1000 PSI)
- **Exclusive waterproof features:** The only thermoplastic connector designed to prevent short circuits due to water ingress under high water pressure
- **Different power supply ratings can't mix:** Six single-rate device polarizations ensure exact voltage, frequency and phase differentiation
- **Added safety measures:** Safety ground makes first, breaks last
- **Ultimate waterproof connection:** Watertight mated or unmated, while many watertight specifications cover mated connections only

Durability

- **Designed for durability:** DuraV® housing material specially selected for hot or cold and chemical washdown duty (flame-safe UL® 94-V0 rated housings)
- **Versatile functionality:** Pin and sleeve design enables higher current flow at cooler temperatures due to large contact circular areas
- **Built to last:** A longer system life under corrosive environments

Performance

- **Long life:** Round, self-cleaning, constant-pressure pin and sleeve contacts of solid CDA 360 brass for long, reliable electrical life
- **Easy installation:** Drop-in assemble interior and easy pressure screw wire termination
- **Reliability:** DurOring™ sealing system for each pin and sleeve and interior assembly
- **Application flexibility:** Bushing size available for every cable diameter
- **Continuous operation:** Superior performance in corrosive environments

Typical application groups

Marine
- Lighting connectors
- Shore-to-ship power
- Low-power welding
- Power distribution panels
- Shipboard power outlets
- Barge power connection

Construction and agricultural
- Generator set panels
- Portable tools and equipment
- Irrigation systems panels
- Portable lighting and equipment

Food processing, brewery/beverage, pulp and paper, pharmaceuticals, portable building power
- Welding outlets
- Motor power connections
- Lighting systems
- Machinery interconnections
- Process control power systems

OEMs
- Export machinery
- Critical power connections and welding systems
- Transportable equipment

Usage

Any application where:
- Electrical connections need protection from water and/or dust entrance to the contacts or the wiring compartment
- Cable-to-connector sealing and device locking designs are critical

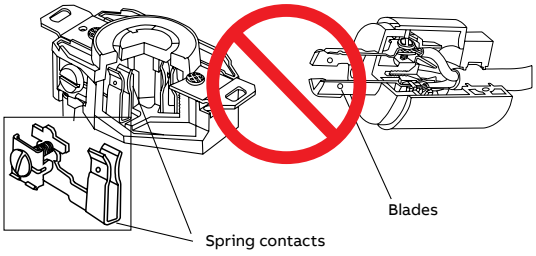
DuraGard® waterproof connections
DuraGard pin and sleeve connections

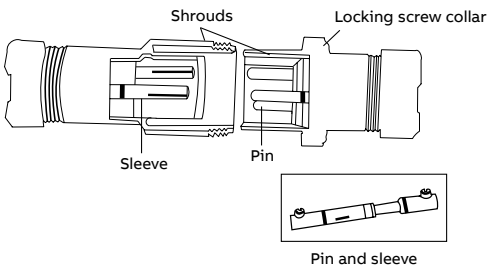
—
01 Pulp and paper
—
02 Food processing
—
03 Beverage and bottling
—
04 Pharmaceutical manufacturing

Washdown duty, chemical, outdoor, industrial and marine use non-metallic plugs, connectors receptacles and inlets – 20, 30, 50 and 60 A, maximum 600 V AC/250 V DC

Pin and sleeve contact devices consist of round male pins that are inserted into tubular female sleeves. Current flows through a large pin-to-sleeve circular contact area. Because current is not restricted through point contact only, higher current flow and cooler operating temperatures are achieved in a compact connection. Wiping action during insertion or withdrawal provides positive self cleaning. Shrouded pins and sleeves are protected from physical damage or casual access and aid in polarization features of the line. The shroud and screw collar completely lock plugs to receptacles or connectors for a reliable connection. Step on the cord, kick or drop a plug – your connection will remain tight.
Pin and sleeve devices are the safety standard for high-current applications worldwide.

Bladed plug and receptacle
Spring blade contact designs offer point contact only, with minimal mechanical support in receptacles. Higher heat is generated in use as contacts loosen with age and dirt accumulation, resulting in failures. Exposed blade contacts can easily be damaged. Contacts are both the electrical and mechanical locking method.





Pin and sleeve connector and plug
Pin and sleeve design enables higher current flow at cooler temperatures due to large circular contact area. Sleeves act as retainers for the pins, making a reliable connection. Shrouded pins and sleeves are protected from damage and inadvertent access. Locking housing screw collars provide for a reliable, long-lasting connection with electrical contacts separate.

The water spray test
1000-PSI water spray was directly applied at the face of DuraGard receptacles. No damage occurred, and no water penetrated the housing or cord seal. DuraGard plugs, connectors and receptacles are designed to withstand water spray test at 1000 PSI. No extra boots or adapters required.

DuraGard: designed for the toughest washdown applications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01


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04

The ultimate in waterproof connections

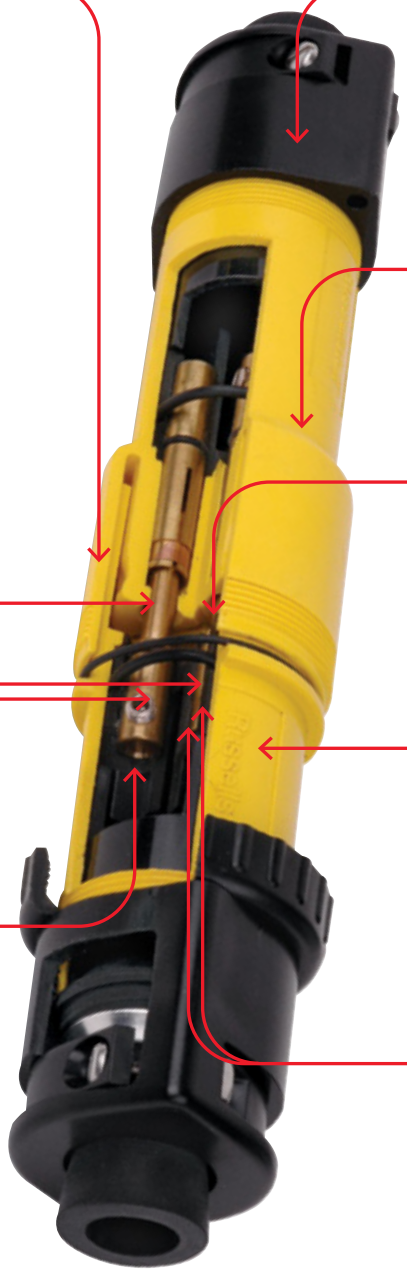
- Washdown duty, chemical, outdoor, industrial and marine use non-metallic plugs, connectors receptacles and inlets – 20, 30, 50 and 60 A, maximum 600 V AC/250 V DC
- 20, 30, 50 and 60 A, 600 V AC, 20 A, 250 V DC

Lockout capable (30/50/60A plugs):
- Access hole (not seen) for padlock hasp
- Interlock engagement CDA 360 solid brass pin and sleeve contacts

High reliability, high-performance connections:
- CDA 360 solid brass pin and sleeve contacts

Long-lasting self-cleaning connections:
- Full round pin and sleeve contacts

Fast, easy, rear-load wiring and assembly:
- Drop-in assembly interior
- Sleeve and cable bushing
- Easy-in pressure screw wiring terminations



Waterproof cable sealing:
- Neoprene compression bushing cable locking system
- Locking bushing nut with external cable clamps
- Bushing sizes available for any cable size

Waterproof locking connections:
- Locking screw collars with O-ring gaskets
- Housing mechanical support and pin and sleeve connection

Safety specified voltage connections:
- Safety ground makes first breaks last
- Voltage polarized to meet NEC 210-7 and OSHA standards

Durable and UL® 94-V0 flame rated housings:
- DuraV® high-impact body and collars
- Thermoset interiors
- Deadfront construction

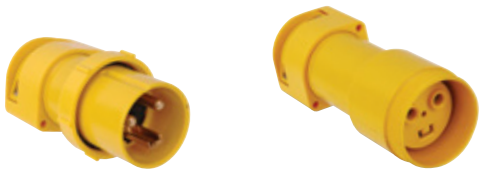
Dry wiring compartments:
- DurOring™ sealing system for each pin and sleeve and interior assembly

01 50 A plug and connector shown

01

DuraGard® waterproof connections

20 A standard service



Device ratings and polarizations

Pole	Wire	Safety polarization (receptacle)	Voltage	❑ Cat. no. ▼	❑ Cat. no. ▼
Product type				**Male plug**	**Female connector**
2	3		125 V AC	9P23U1	9C23U1
			250 V AC	9P23U2	9C23U2
			277 V AC	9P23U3	9C23U3
			480 V AC	9P23U4	9C23U4
			600 V AC	9P23U5	9C23U5
			through 600 V AC/250 V DC	9P23U0	9C23U0
3	4		125/250 V AC	9P24U1	9C24U1
			3Ø 250 V AC	9P24U2	9C24U2
			3Ø 480 V AC	9P24U4	9C24U4
			3Ø 600 V AC	9P24U5	9C24U5
			through 600 V AC/250 V DC	9P24U0	9C24U0

Maximum 600 V AC/250 V DC
❑ Add suffix – / xxxx for bushing I.D. (page 78) or conduit adapter assembled.
♦ "W" suffix is watertight; "F" suffix for splash-proof spring flap cover.
* Consult Technical Services.

Standard bushing I.D.: Plug/conn.*	❑ Cat. no. ▼
	Female receptacle
Standard 0.625"; or optional size, see page 78	9R23U1W
	9R23U2W
	9R23U3W
	9R23U4W
	9R23U5W
	9R23U0W
Standard 0.625"; or optional size, see page 78	9R24U1W
	9R24U2W
	9R24U4W
	9R24U5W
	9R24UOW

Maximum 600 V A/250 V DC
❑ Add suffix – / xxxx for bushing I.D. (page 78) or conduit adapter assembled.
♦ "W" suffix is watertight; "F" suffix for splash-proof spring flap cover.
* Consult Technical Services.

DuraGard® waterproof connections

30 A standard service and 30 A reverse service

Device ratings and polarizations

Pole	Wire	Safety polarization (receptacle)	Voltage	❑ Cat. no. ▼	❑ Cat. no. ▼
Product type				**Male plug**	**Female connector**
2	3		125 V AC	9P33U1	9C33U1
			250 V AC	9P33U2	9C33U2
			277 V AC	9P33U3	9C33U3
			480 V AC	9P33U4	9C33U4
			600 V AC	9P33U5	9C33U5
			through 600 V AC/250 V DC	9P33U0	9C33U0
3	4		125/250 V AC	9P34U1	9C34U1
			3Ø 250 V AC	9P34U2	9C34U2
			3Ø 480 V AC	9P34U4	9C34U4
			3Ø 600 V AC	9P34U5	9C34U5
			through 600 V AC/250 V DC	9P34U0	9C34U0

Maximum 600 V AC/250 V DC

❑ Add suffix – / xxxx for bushing I.D. (page 78) or conduit adapter assembled.

♦ "W" suffix indicates watertight receptacle; "F" suffix indicates splash-proof spring flap cover included.

* Consult Technical Services.



Standard bushing I.D.: Plug/conn.*	❑ Cat. no. ▼ Female receptacle	❑ Cat. no. ▼ Female plug	❑ Cat. no. ▼ Male receptacle
Standard 0.700"; for optional size, see page 78	9R33U1W	9F33U1	9B33U1F
	9R33U2W	9F33U2	9B33U2F
	9R33U3W	9F33U3	9B33U3F
	9R33U4W	9F33U4	9B33U4F
	9R33U5W	9F33U5	9B33U5F
	9R33U0W	9F33UØ	9B33UØF
Standard 0.750"; for optional size, see page 78	9R34U1W	9F34U1	9B34U1F
	9R34U2W	9F34U2	9B34U2F
	9R34U4W	9F34U4	9B34U4F
	9R34U5W	9F34U5	9B34U5F
	9R34UOW	9F34UØ	9B34UØF

❑ Add suffix – / xxxx for bushing I.D. (page 78) or conduit adapter assembled.
♦ "W" suffix indicates watertight receptacle; "F" suffix indicates splash-proof spring flap cover included.
* Consult Technical Services.

DuraGard® waterproof connections

50 A standard service and 50 A reverse service

Device ratings and polarizations

Pole	Wire	Safety polarization (receptacle)	Voltage	❑ Cat. no. ▼	❑ Cat. no. ▼
Product type				**Male plug**	**Female connector**
2	3		125 V AC	9P53U1	9C53U1
			250 V AC	9P53U2	9C53U2
			277 V AC	9P53U3	9C53U3
			480 V AC	9P53U4	9C53U4
			600 V AC	9P53U5	9C53U5
			through 600 V AC/250 V DC	9P53U0	9C53U0
3	4		125/250 V AC	9P54U1	9C54U1
			3Ø 250 V AC	9P54U2	9C54U2
			3Ø 480 V AC	9P54U4	9C54U4
			3Ø 600 V AC	9P54U5	9C54U5
			through 600 V AC/250 V DC	9P54U0	9C54U0

Maximum 600 V AC/250 V DC

❑ Add suffix – / xxxx for bushing I.D. (page 78) or conduit adapter assembled.

♦ "W" suffix is watertight; "F" suffix for splash-proof spring flap cover.

Standard bushing I.D.: Plug/conn.*	❑ Cat. no. ▼ Female receptacle	❑ Cat. no. ▼ Female plug	❑ Cat. no. ▼ Male receptacle
Standard 0.925"; for optional size, see page 78	9R53U1W	9F53U1	9B53U1F
	9R53U2W	9F53U2	9B53U2F
	9R53U3W	9F53U3	9B53U3F
	9R53U4W	9F53U4	9B53U4F
	9R53U5W	9F53U5	9B53U5F
	9R53U0W	9F53UØ	9B53UØF
Standard 0.925"; for optional size, see page 78	9R54U1W	9F54U1	9B54U1F
	9R54U2W	9F54U2	9B54U2F
	9R54U4W	9F54U4	9B54U4F
	9R54U5W	9F54U5	9B54U5F
	9R54U0W	9F54UØ	9B54UØF

❑ Add suffix – / xxxx for bushing I.D. (page 78) or conduit adapter assembled.
♦ "W" suffix is watertight; "F" suffix for splash-proof spring flap cover.
* Consult Technical Services.

DuraGard® waterproof connections

60 A standard service



Device ratings and polarizations

Pole	Wire	Safety polarization (receptacle)	Standard bushing I.D.: Plug/conn.*	Voltage	❑ Cat. no. ▼	❑ Cat. no. ▼	❑ Cat. no. ▼
Product type					**Male plug**	**Female connector**	**Female receptacle**
2	3		Standard 1.000"; for optional size, see page 78	125 V AC	9P63U1	9C63U1	9R63U1
				250 V AC	9P63U2	9C63U2	9R63U2
3	4		Standard 1.000"; for optional size, see page 78	125/250 V AC	9P64U1	9C64U1	9R64U1
				3Ø 250 V AC	9P64U2	9C64U2	9R64U2

Maximum 600 V AC or 250 V DC
❑ Add suffix — / xxxx for bushing I.D. (page 78) or conduit adapter assembled.
♦ "W" suffix is watertight; "F" suffix for splash-proof spring flap cover.

60 A reverse service


Device ratings and polarizations

Pole	Wire	Safety polarization (receptacle)	Standard bushing I.D.: Plug/conn.*	Voltage	❑ Cat. no. ▼	❑ Cat. no. ▼
Product type					**Female plug**	**Male receptacle**
2	3		Standard 1.000"; for optional size, see page 78	125 V AC	9F63U1	9B63U1
				250 V AC	9F63U2	9B63U2
3	4		Standard 1.000"; for optional size, see page 78	125/250 V AC	9F64U1	9B64U1
				3Ø 250 V AC	9F64U2	9B64U2

❑ Add suffix – / xxxx for bushing I.D. (page 78) or conduit adapter assembled.
♦ "W" suffix is watertight; "F" suffix for splash-proof spring flap cover.
* Consult Technical Services.

DuraGard® waterproof connections

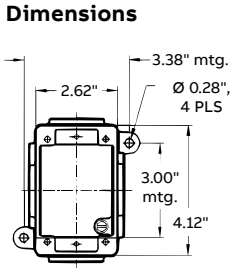
Conduit boxes (for surface mounting)

Type FD

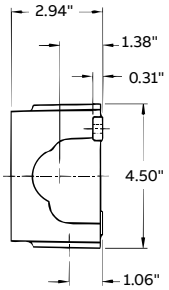
Type	Cast aluminum Cat. no.	Cast brass Cat. no.	Use with
Single	3711A	3731-RS	20 A
Double	3712A	3732-RS	30 A
DSFD	3781A	–	50 A

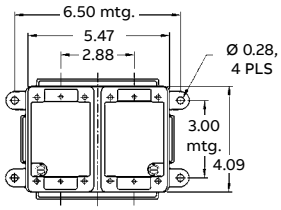
Note: ¾" NPT hole std. additional accessories are available.
Please consult your ABB representative.

Dimensions

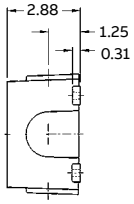


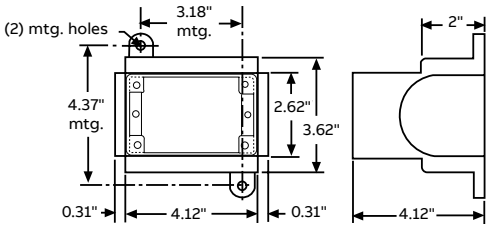
Catalog number 3711A





Catalog number 3712A



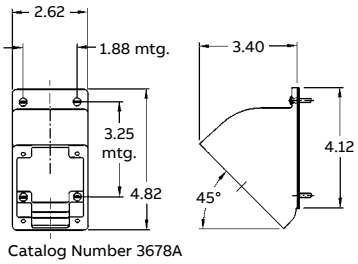


Catalog number 3781A

45° Angle adapter

Cast aluminum Cat. no.	Cast brass Cat. no.
3678A	3678B

Dimensions



Catalog Number 3678A

DuraGard® waterproof connections

Conduit adapter kits, cable busings, and replacement caps

Conduit adapter kits (plugs or connectors)

Size (in.)	20 A Cat. no.	30 A Cat. no.	50 A Cat. no.	60 A Cat. no.
½	9X2C50	9X3C50	–	–
¾	9X2C75	9X3C75	9X5C75	9X6C75
1	–	9X3C10	9X5C10	9X6C10

Cable bushings

20 A
cable bushing

Max. cable O.D. (in.)	20 A Cat. no.	30, 50 & 60 A Cat. no.
0.375	C16984A	–
0.437	C16984B	–
0.500	C16984C	–
0.545	–	2000-11
0.562	C16984D	–
0.606	B16506	–
0.620	–	2000-03
0.625	B16524	–
0.700	–	2000-04
0.750	–	2000-01
0.800	–	2000-06
0.870	–	2000-02
0.925	–	2000-12
1.000	–	2000-05

(Minimum limit 85% of O.D. size for sealing.)
Material – Oil-resistant Neoprene.
State catalog number followed by slash (/) and max. cable O.D.; example: 9P33U1/1000 will order the 1.000" bushing instead of the standard 0.700" bushing for the 9P33U1.

Replacement caps

9X2PSC

7X3RCF

9X3CC

7X6RCW

Description	20 A Cat. no.	30 A Cat. no.	50 A Cat. no.	60 A Cat. no.
Screw cap (connector)	9X2PSC	9X3PSC	9X5PSC	9X6PSC
Cup cap (plug)	–	9X3CC	9X3CC	9X3CC
Screw cap (receptacle)	–	7X3RCW	7X5RCW	7X6RCW
Flap cap (receptacle)	–	7X3RCF	7X5RCF	7X6RCF

DuraGard® waterproof connections

Replacement interiors

Replacement interiors

Amps	Poles/ wires	Voltage polarization	Cat. no. Male interior assembly	Female interior assembly
20	2P3W	125 V AC	9XM23U1	9XF23U1
		250 V AC	9XM23U2	9XF23U2
		277 V AC	9XM23U3	9XF23U3
		480 V AC	9XM23U4	9XF23U4
		600 V AC	9XM23U5	9XF23U5
		through 600 V AC/250 V DC	9XM23U0	9XF23U0
30	2P3W	125 V AC	9XM33U1	9XF33U1
		250 V AC	9XM33U2	9XF33U2
		277 V AC	9XM33U3	9XF33U3
		480 V AC	9XM33U4	9XF33U4
		600 V AC	9XM33U5	9XF33U5
		through 600 V AC/250 V DC	9XM33U0	9XF33U0
50	2P3W	125 V AC	9XM53U1	9XF53U1
		250 V AC	9XM53U2	9XF53U2
		480 V AC	9XM53U4	9XF53U4
		600 V AC	9XM53U5	9XF53U5
		through 600 V AC/250 V DC	9XM53U0	9XF53U0
20	3P4W	125/250 V AC	9XM24U1	9XF24U1
		3Ø 250 V AC	9XM24U2	9XF24U2
		3Ø 480 V AC	9XM24U4	9XF24U4
		3Ø 600 V AC	9XM24U5	9XF24U5
		through 600 V AC/250 V DC	9XM24U0	9XF24U0
30	3P4W	125/250 V AC	9XM34U1	9XF34U1
		3Ø 250 V AC	9XM34U2	9XF34U2
		3Ø 480 V AC	9XM34U4	9XF34U4
		3Ø 600 V AC	9XM34U5	9XF34U5
		through 600 V AC/250 V DC	9XM34U0	9XF34U0
50	3P4W	125/250 V AC	9XM54U1	9XF54U1
		3Ø 250 V AC	9XM54U2	9XF54U2
		3Ø 480 V AC	9XM54U4	9XF54U4
		3Ø 600 V AC	9XM54U5	9XF54U5
		through 600 V AC/250 V DC	9XM54U0	9XF54U0
60	2P3W	125 V AC	9XM63U1	9XF63U1
		250 V AC	9XM63U2	9XF63U2
60	3P4W	125/250 V AC	9XM64U1	9XF64U1
		3Ø 250 V AC	9XM64U2	9XF64U2

DuraGard® waterproof connections

Safety interlocks

Circuit breaker interlocked outlet:
- 30 A and 50 A ranges and polarizations to 480 V AC
- 22 kA interrupt capacity breaker
- Easy handle reset after trip
- Auxiliary switch or other options

User friendly – Flexible mounting:
- Variable footprint mounting tabs
- Compact size fits 8" standard I-beam webs
- Conduit entry from top, bottom or side (¾", 1" or 1¼" NPT)
- Large red handle with lockout access

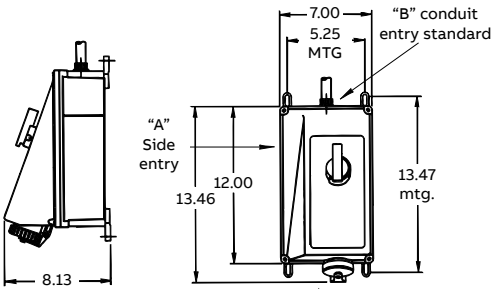
Flame rated and DuraV® tough housing:
- UL® 94-V0 housing and interior with stainless steel components
- High-impact thermoplastic housing
- NEMA 4X construction

Safety interlocks

Amps	Poles/ wires	Voltage	Safety interlock with circuit breaker♦[1]	Circuit breaker trip rating (A)	Mating plug	Rotary controller	Cat. no. Replacement interior
30	3P4W	125/250 V AC	9MT34U1W30B	30	9P34U1	9MI34U1WNAB	9XL34U1
		3Ø 250 V AC	9MT34U2W30B	30	9P34U2	9MI34U2WNAB	9XL34U2
		3Ø 480 V AC	9MT34U4W30B	30	9P34U4	9MI34U4WNAB	9XL34U4
		3Ø 600 V AC	9MT34U5W30B	30	9P34U5	9MI34U5WNAB	9XL34U5
		through 600 V AC/3P4W	9MT34U0W30B	30	9P34U0	9MI34U0WNAB	9XL34U0
50	3P4W	125/250 V AC	9MT54U1W50B	50	9P54U1	9MI54U1WNAB	9XL54U1
		3Ø 250 V AC	9MT54U2W50B	50	9P54U2	9MI54U2WNAB	9XL54U2
		3Ø 480 V AC	9MT54U4W50B	50	9P54U4	9MI54U4WNAB	9XL54U4
		3Ø 600 V AC	9MT54U5W50B	50	9P54U5	9MI54U5WNAB	9XL54U5
		through 600 V AC/3P4W	9MT54U0W50B	50	9P54U0	9MI54U0WNAB	9XL54U0

Note: 1. Change suffix for alternate trip ratings. Example: 9MT54U2W30B – 50 A, 3P4W, safety interlock with 30 A circuit breaker, conduit top entry.
♦ Change "W" to "F" for flap cap access. Example: 9MI34U2F30B – 30 A, 3P4W, safety interlock with rotary controller and flap cap.
(Minimum limit 85% of O.D. size for sealing.)
Foot and hardware replacement Kit: Cat. no. 9XLMF (non-metallic) and Cat. no. 9XLMF-SS (stainless steel).

Dimensions



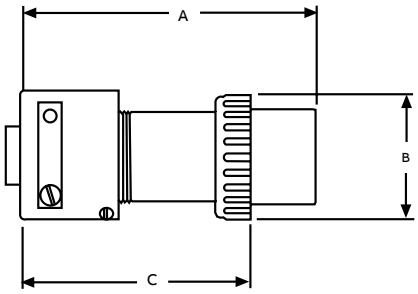
DuraGard® waterproof connections
Dimensions

Plugs and female plugs

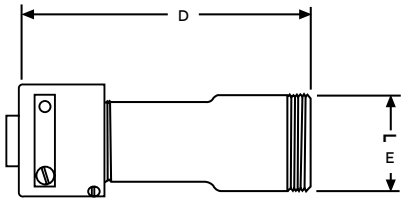
Amps		A*	B	C*	D	E	Max. AWG	Terminal Ø in./mm
20	Inches	3.87	2.16	2.75	4.75	1.88	12	0.140/0.0055
	mm	98.3	54.9	69.9	120.7	47.8		
30	Inches	5.385	2.38	4.16	6.25	2.13	8	0.235/0.0092
	mm	136.6	60.5	105.7	158.8	54.1		
50	Inches	5.75	2.38	4.16	6.25	2.13	6	0.235/0.0092
	mm	146.1	60.5	105.7	158.8	54.1		
60	Inches	5.75	2.38	4.16	6.25	2.13	6	0.235/0.0092
	mm	146.1	60.5	105.7	158.8	54.1		

* Dimensions will vary slightly with assembly.

Dimensions



Plugs and female plugs

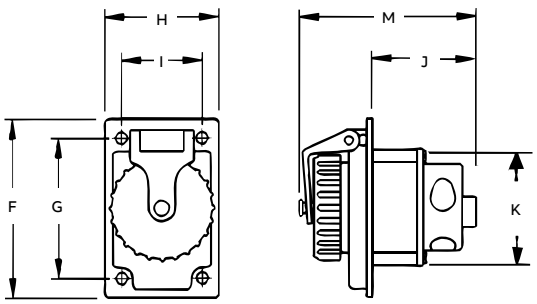


Connectors

Receptacles and male receptacles

Amps		F	G	H	I	J	K	M	Max. AWG	Terminal Ø in./mm
20	Inches	4.14	3.25	2.66	1.88	1.49	2.26	3.17	12	0.140/0.0055
	mm	105.2	82.6	67.6	47.8	37.8	57.4	80.5		
30	Inches	4.14	3.25	2.66	1.88	2.44	2.71	4.12	8	0.235/0.0092
	mm	105.2	82.6	67.6	47.8	62.0	68.8	104.6		
50	Inches	4.14	3.25	2.66	1.88	2.44	2.71	4.12	6	0.235/0.0092
	mm	105.2	82.6	67.6	47.8	62.0	68.8	104.6		
60	Inches	4.14	3.25	2.66	1.88	2.44	2.71	4.12	6	0.235/0.0092
	mm	105.2	82.6	67.6	47.8	62.0	68.8	104.6		

Dimensions



Screw cover shown. Flap cover also available; no dimensional changes.

DuraGard® waterproof connections

Plugs, connectors and receptacles

Materials

Part	Material
Contact carrier interior	Molded arc-resistant UL 94-V0 phenolic thermoset
Housing, gland nuts, screw collar rings	DuraV® UL 94-V0, high-impact thermoplastic
O-rings	Buna-N (nitrile)
Contacts: pins and sleeves	Brass CDA 360
Hinge pins (receptacle)	Stainless steel
Terminals	Brass CDA 360
Terminal screws, flap springs, assembly screws, nuts, hardware	Stainless steel
Gland friction washer	20 A – nylon 30, 50 and 60 A – aluminum
Cable clamp bushing	Neoprene

Approvals

630/E47956 LL14096

* TUV & PSE listed product also available; contact Technical Services.

Performance – Electrical

Application	Performance
Dielectric voltage withstand	3000 V
Max. Working voltage	6000 V RMS (minimum creepage and minimum clearance per UL 840)
Circuit interrupting/ load breaking	UL® listed and CSA certified for circuit interrupting at full rated current
Temperature rise	Max. 30 °C/86 °F temperature rise at full rated current after 50 cycles of overload at 150% rated current at 0.75 pf

Performance – Mechanical

Application	Performance
Impact resistance	Per UL 1682 paragraph 34
Cord accommodation	Round portable service cords. 10 standard diameters from 0.405" to 1.00", custom sizes to spec
Terminal identification	In accordance with UL 1682
Cable pull out force	In accordance with UL 1682
Product identification	Identification label and molded in name
Lockout/tagout	Lockout/tagout hole on plug complies with OSHA Reg. 29 CFR 1910.147

Performance – Environmental

Application	Performance
Moisture resistance	Per UL 1682 paragraph 49 watertight/ flap screw cover on receptacle, O-rings on all pins and sleeves, interiors and plug shell. Watertight even when not engaged
Flammability	V0 or better per UL 94
Operating Temperatures	Maximum continuous: 95 °C/203 °F Minimum: -40 °C/-40 °F without impact
Chemicals	Resists standard industrial hydrocarbons, acids, bases and solvents
UV resistance	UV resistant housing per UL 746C

DuraGard® waterproof connections
Safety interlocks

Performance – Electrical

Application	Performance
Dielectric voltage withstand	3000 V
Max. Working voltage	480 V RMS (minimum creepage distance and minimum clearance per UL® 840) (using circuit breaker)
Circuit interrupting/ load breaking	UL listed and CSA certified for circuit interrupting at full rated current
Temperature rise	Max. 30 °C/86 °F temperature rise at full rated current after 50 cycles of overload at 150% rated current at 0.75 pf
Shrouded contacts	Complies with California Code Title 8, Art. 51, S2510.7(b) for devices exceeding 300 V AC

Performance – Mechanical

Application	Performance
Impact resistance	Per UL 1682 Paragraph 34
Wiring accommodation	Conduit entries at top, side and bottom, 0.750" NPT top entry standard
Terminal identification	In accordance with UL 1682
Plug pull out force	In accordance with UL 1682
Product identification	Identification label
Lockout/tagout	Lockout/tagout access on switch complies with OSHA Reg. 29 CFR 1910.147

Performance – Environmental

Application	Performance
Moisture resistance	Per UL 1682 Paragraph 49. Watertight/ flap screw cover on receptacle, O-rings on all pins and sleeves, interiors and plug shell. Watertight even when not engaged (screw cover closed/locked)
Flammability	V0 or better per UL 94
Operating	Maximum continuous: 95 °C/203 °F
Temperatures	Minimum: -40 °C /-40 °F without impact (Note: per C/B trip at elevated temps.)
Chemicals	Resists standard industrial hydrocarbons, acids, bases and solvents
UV resistance	UV-resistant housing per UL 746C

Materials

Part	Material
Contact carrier interior	Molded arc-resistant UL 94-V0 thermoset material
Housing, gland nuts, screw collar rings	DuraV® UL 94-V0, high-impact Thermoplastic
O-rings	Buna-N (Nitrile)
Contacts: pins and sleeves	Brass CDA 360
Hinge pins (receptacle)	Stainless steel
Terminals	Brass CDA 360
Terminal screws, flap springs, assembly screws, nuts, hardware	Stainless steel
Gland friction washer	20 A – nylon 30, 50 and 60 A – aluminum
Cable clamp bushing	Neoprene

Approvals

FS/FD™ metallic connections
Features and benefits

The FS/FD general-purpose interconnection system is designed for lower-amperage marine and rough service applications with rugged die-cast aluminum housings and epoxy powder-coated finishes. Interlocked receptacles add branch circuit-protected outlet capability and base receptacles fit existing Russellstoll® FS, FD and DSFD single- and multi-gang back boxes. Its versatility and watertight features make it ideal for washdown industrial and light marine applications.

Safety
- Circuit-interrupting up to 30 A, 250 V AC (20 A, 600 V AC)
- Factory-polarized interiors permit mating of same voltage/same type devices through configured ground pins and housing features
- Shell grounding by means of ground strap integral with ground contact for assured assembly safety

Durability
- Constructed of copper-free cast aluminum (brass construction also available)
- Optional conduit adapters, strain reliefs and cable bushings available (modified catalog number construction)
- Non-metallic versions of most metallic plugs and receptacles also available (see DuraGard®, pages 66–83)

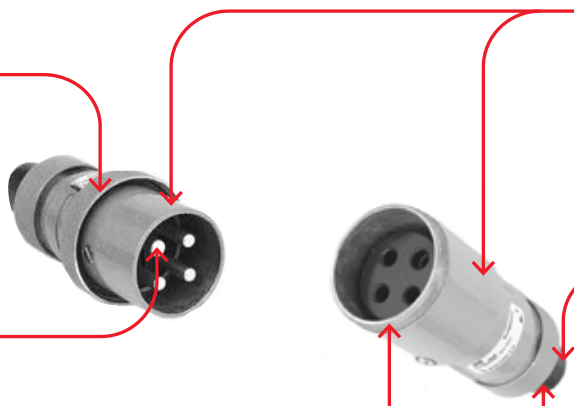
Performance
- Precision-made, self-aligning and self-wiping contacts
- Devices available in watertight and weathertight versions
- Solderless binding screw terminals for convenient wiring (20 A, 2P3W devices have set-screw pressure terminals)

Plug and connector (+ reverse service female plug)

Gasketed screw collar for watertight connection when plug is mated to receptacle or connector

Ground contacts “make first” and “break last” for safety

Six voltage polarizations available from U0–U5 (2P3W; 3P4W in UØ)



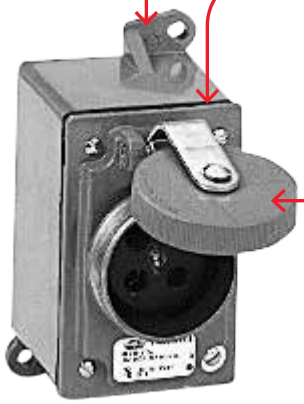
Cast aluminum, corrosion-resistant copper-free alloy or cast brass housings for rough duty or marine service; two-layer electrostatic epoxy powder-coat finish

Gland nut and oil-resistant neoprene cable bushing gland to prevent dust and moisture accumulation

Compression-style cable bushing and gland nut system; external cable clamping or conduit fitting adapters available separately or as standard product; modified catalog number can include special construction or bushing size

Receptacle (+ reverse service male inlet)

Furnished with single-gang conduit box standard; die-cast or heavy-duty thick wall cast boxes available (copper-free aluminum or brass); can be pre-drilled to customer specification



01

Waterproof gasketed flap-screw cap

Molded arc-resisting interiors with precision-made, self-wiping, self-aligning brass contacts; housings positively grounded by phosphor bronze ground straps integral with ground contact; contacts “make first” and “break last” for safe ground; available in brass for marine applications

01 FDWS-62 box shown. See accessories for complete box selections

FS/FD™ metallic connections

10–30 A

10–30 A

Poles/wires	Amps	Voltage	Polarization (receptacle)	Aluminum	Cast brass	Aluminum	Cast brass
Product type					**Male plugs**		**Female connectors**
2P3W	15	125 V AC		3720U-2	3720BU-2	3913U-2	3913BU-2
		177 V AC		3720U-3	3720BU-3	3913U-3	3913BU-3
		480 V AC		3720U-4	3720BU-4	3913U-4	3913BU-4
		600 V AC		3720U-5	3720BU-5	3913U-5	3913BU-5
	20	250 V AC		3720	3720B	3913	3913B
		125 V AC		3720U-1	3720BU-1	3913U-1	3913BU-1
	30	250 V AC		3750	3750B	3933	3933B
3P4W	10	600 V AC		3730	3730B	3914	3914B
	15	250 V AC		3730	3730B	3914	3914B
	20	600 V AC		3760	3760B	3934	3934B
	30	250 V AC		3760	3760B	3934	3934B

Cable bushings – Oil-resistant, neoprene cable bushing is regularly furnished with hole sizes listed above. Other hole sizes are available at no extra cost when specified on order. See page 90 for available sizes.

Screw caps for connectors can be furnished with retained screw cap at extra cost. For kits order:

9X2PSC 20 A screw cap
9X3PSC 30 A screw cap
F26874C 30 A plug cup cap

See the DuraGard® section for thermoplastic families.

Standard cable bushing hole diameter

Prefix	Hole dia.
3720	–
3730	–
3750, 3760	–
3913	5/8
3914	11/16
3933, 3934	3/4
3789	–
3790	–
3809, 3810	–

For other plug and connector accessories, see pages 90–H-93.
Plugs can be furnished with adapters to accommodate rigid conduit or standard connectors. For armored cable or flexible conduit, see page 90.

Inlets

Aluminum with box *	Cast brass with box *	Aluminum	Cast brass	Aluminum with box FDWS-62	Cast brass with box 3731
	Female receptacles		Female plugs reverse service		Male receptacles reverse service
3743U-2	3763U-2	3789U-2	3789BU-2	3776U-2	3779U-2
3743U-3	3763U-3	3789U-3	3789BU-3	3776U-3	3779U-3
3743U-4	3763U-4	3789U-4	3789BU-4	3776U-4	3779U-4
3743U-5	3763U-5	3789U-5	3789BU-5	3776U-5	3779U-5
3743	3763	3789	3789B	3776	3779
3743U-1	3763U-1	3789U-1	3789BU-1	3776U-1	3779U-1
3753	3773	3809[1]	3809B[1]	3796[2]	3799[3]
3744	3764	3790	3790B	3777	3780
3744	3764	3790	3790B	3777	3780
3754	3774	3810	3810B	3797	3800
3754	3774	3810	3810B	3797	3800

* Receptacles come with the following boxes:

Material	Amps	Box
Aluminum	10, 15 and 20	FSWS-62
	30	FDWS-62
Brass	10, 15 and 20	3721
	30	3731

Note:
1. Also in plastic. Use 3809P or 9F33UO.
2. Also in plastic. Use 3796P – Aluminum back box (use 3797-P for brass).
3. Also in plastic. Use 3799P (Brass J-Box) or 9B33UØF (without J-Box).
For 20 A/30 A Thermoplastic devices, see DuraGard® section.
Mating with DuraGard line:
– 20 A devices will mate and lock across lines.
– 30 A metal male devices cannot mate to DuraGard; 30 A female devices can be mixed.

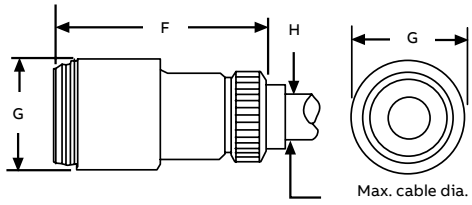
FS/FD™ metallic connections

Dimensions

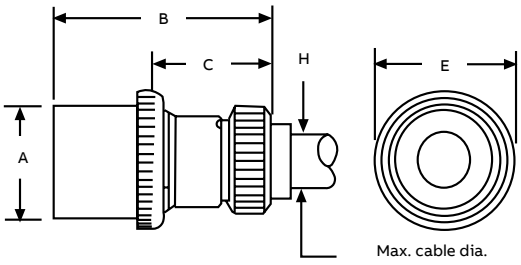
Plug, female plug and connector

	A		B		C		E		F		G		H	
Amps	**(in.)**	**(mm)**	**(in.)**	**(mm)**	**(in.)**	**(mm)**	**(in.)**	**(mm)**	**(in.)**	**(mm)**	**(in.)**	**(mm)**	**(in.)**	**(mm)**
10	1.75	45.66	3.62	92.07	2.25	25.15	2.00	50.80	4.00	101.60	1.87	47.62	0.75	19.050
15	1.75	45.65	3.62	92.07	2.25	57.15	2.00	50.80	4.00	101.60	1.87	47.62	0.75	19.050
20	1.75	45.65	3.62	92.07	2.25	57.15	2.00	50.80	4.00	101.60	1.87	47.62	0.75	19.050
30	1.87	47.62	3.75	92.25	2.25	57.15	2.25	57.15	4.25	107.95	2.25	57.15	1.12	28.57

Dimensions

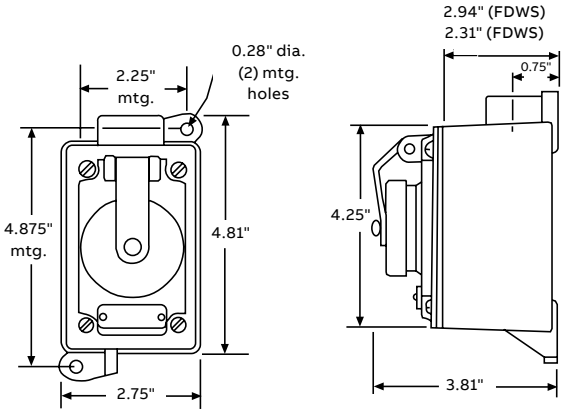


Connectors

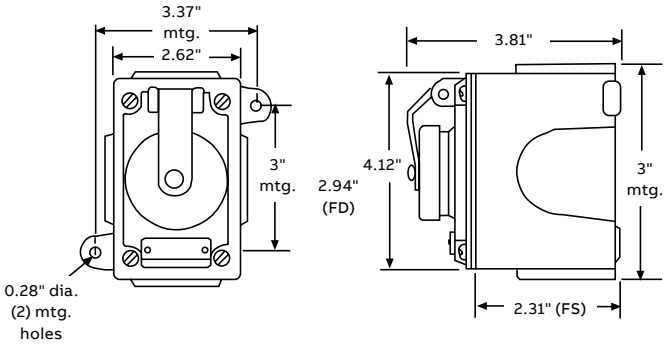


Plugs and female plugs

Receptacles and male receptacles



Standard die-cast aluminum back box
(FSWS/FDWS)



Cast aluminum/cast brass back box
(3701–3732 series)

FS/FD™ metallic connections

Performance, materials & approvals

Performance – Electrical

Application	Performance
Dielectric voltage withstand	3000 V
Max. Working voltage	600 V RMS (minimum creepage distance and minimum clearance per UL® 840)
Circuit interrupting/ load breaking	UL listed and CSA certified for circuit interrupting at full rated current
Temperature rise	Max. 30 °C/86 °F temperature rise at full rated current after 50 cycles of overload at 150% rated current at 0.75 pF
Shrouded contacts	Complies with California code title 8, art. 51, S2510.7(b) for devices exceeding 300 V AC
Horsepower	Per NEC® 430-151 ratings (non-interrupting)

Materials

Part	Material
Contact carrier interior	Thermoset
Housing, gland nuts, screw collar rings	Cast aluminum or brass
Contacts: pins and sleeves	Brass
Hinge pins (receptacle)	Stainless steel
Terminals	Brass
Terminal screws, flap springs, assembly screws, nuts, hardware	Stainless steel
Gland friction washer	Brass or aluminum
Cable clamp bushing	Neoprene

Performance – Mechanical

Application	Performance
Impact resistance	Per UL 1682 paragraph 34
Cord accommodation	Round portable service cords per UL standard 62 and CSA C22.2 No. 49.1
Terminal identification	In accordance with UL 1682
Cable pull out force	In accordance with UL 1682
Product identification	Identification label and name per UL 1686

Approvals

E2630/E47956 LL14096

NEC and National Electrical Code are registered trademarks of the National Fire Protection Association, Inc.

Performance – Environmental

Application	Performance
Moisture resistance	Per UL 1682 paragraph 49 Watertight/flap screw cover on receptacle
Flammability	VØ/5VA per UL 94
Operating Temperatures	Maximum continuous: 95 °C/203 °F Minimum: -40 °C/-40 °F without impact
Chemicals	Resists standard industrial hydrocarbons, acids, bases and solvents

FS/FD™ metallic connections

For plugs and connectors

- Provides extra clamping protection in hard service applications. Relieves terminals and rubber gland of all cable strain.

- Adapter tapped with NPT thread to accommodate armored and non-metallic cable or flexible conduit.

Combination gland nut and cable clamp

Plug or connector size	Cast aluminum Cat. no.	Cast brass Cat. no.	Max. cable dia. (in.)
10–20 A (Ex: 3913)	3905	3905B	0.62
20–30 A (Ex: 3934)	3906	3906B	1.12

Material – Cast aluminum, corrosion-resistant copper-free alloy; cast brass, epoxy powder coat finish.

Conduit adapters

Plug or connector size	Cast aluminum Cat. no.	Cast brass Cat. no.	Tapped NPT (in.)
10–20 A (Ex: 3913)	FSA11	FSA11B	½
	FSA12	FSA12B	¾
20-30 A (Ex: 3934)	FSA21	FSA21B	½
	FSA22	FSA22B	¾
	FSA23	FSA23B	1

Furnished complete with gasket.

Type 2
Cable bushing

Type 3
Cable bushing

Cable bushings

Hole diameter for cable (in.)	Type 2 10 A	Type 3 20 and 30 A
0.313	SG05	–
0.375	SG1	JG31
0.438	SG15	–
0.500	SG2	JG32
0.531	SG2A	–
0.563	SG25	JG325
0.594	SG2B	–
0.625	SG3	JG33
0.688	SG3A	–
0.750	SG4	JG34
0.875	–	JG35
1.000	–	JG36**
1.125	–	JG361**

** Special for large O.D. cable.
Note: When standard plugs or connectors are required to be furnished with one or more of the above accessories, add the suffix and catalog number of the accessory selected to the catalog number of the plug or connector. Complete list price is the total of the list price of the device plus the list price of the accessory.
Examples – Using catalog no. 3934:

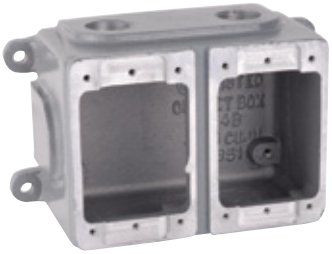
Combo. gland nut and cable clamp	3934-3906
Adapter at ¾"	3934-FSA22
½" Cable bushing	3934-JG32

Material – Oil-resistant neoprene.

FS/FD™ metallic connections

Type FS (shallow) and Type FD (deep)

Single-gang



Two-gang

DSFD

- Aluminum boxes have 6-32 cover mounting holes tapped to accommodate all FS and FD cover assemblies.
- Brass boxes have 10-24 cover mounting holes tapped to accommodate all FS and FD cover assemblies.

Type FS (shallow) and Type FD (deep)

Gangs	Type	Cast aluminum	Cast brass	Overall dimensions* (in.)	For use with
Single	FS	3701A	3721	4.12 x 2.62 x 2.31	15–20 A
	FD	3711A	3731	4.12 x 2.62 x 2.94	30 A
	DSFD	3781A	–	4.12 x 3.62 x 4.12	30 A
Two	FS	3702A	3722	4.12 x 5.5 x 2.25	15–20 A
	FD	3712A	3732	4.12 x 5.62 x 2.87	30 A

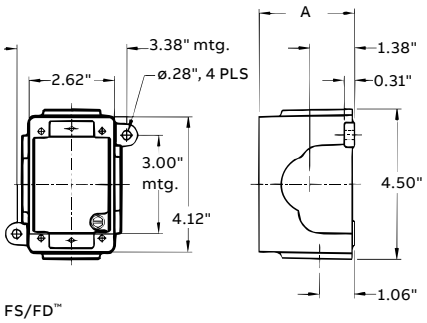
* Dimensions are overall exclusive of conduit pads and mounting lugs
Note: When Type FD devices (20A) are to be mounted in boxes, Type FD boxes should be used.
FS boxes will not accommodate FD devices (30A or 3P4W).
Mounting – All the above boxes are for surface mounting.
For flush mounting, see page 92.
Boxes – Cast brass, natural finish; cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish.
Outlets – Unless otherwise specified, furnished with one 0.75" outlet per gang, top or bottom. Additional outlets charged extra – see price list. Specify size and location.
Maximum conduit – FS and FD: 1", one per gang top and bottom and one each side.
DSFD – One 1.5" or two 0.5" top and bottom.
Cast iron available on special order – consult your ABB representative.

Dimensions

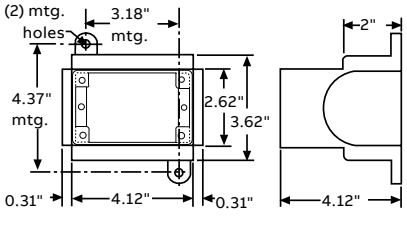
Type	A (in.)
FS	2.31
FD	2.94

A (in.)			B (in.)
FS	FD	FS	FD
6.50	6.50	5.50	5.62

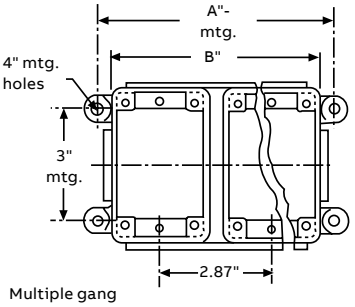
Dimensions



FS/FD™



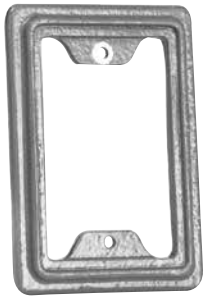
DSFD



Multiple gang

FS/FD™ metallic connections

Adapter flush frames*



- For mounting to standard wall outlet boxes (2-screw mount)

Gangs	Cast aluminum	Cast brass	Overall dimensions (in.)
1	3671A	3681	5 x 3.5
2	3672A	3682	5 x 6.5

Adapters and covers to fit boxes on page 92–93.
* Furnished complete with gasket and screws.

Blank cover*

Covers standard FS/FD box openings.

Cat. no.	Material
3677A	Cast aluminum
3687	Cast brass

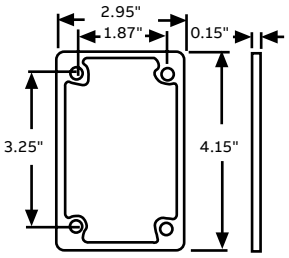
* Furnished complete with gasket and screws.

Flush wall mounting extension*

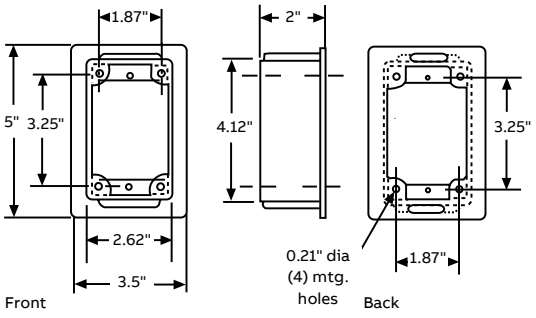
Cat. no.	Material
3679A	Cast aluminum
3679B	Cast brass

* Furnished complete with gasket and screws.

Dimensions



Dimensions



FS/FD™ metallic connections

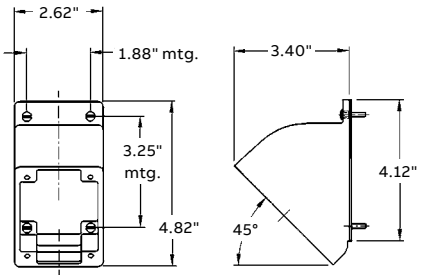
45° Angle adapter*

Mounts to any FS/FD box.

Cat. no.	Material
3678A	Cast aluminum
3678B	Cast brass

* Furnished complete with gasket and screws.

Dimensions



Type FSWS and FDWS (with mounting shelf for box-mounted devices)

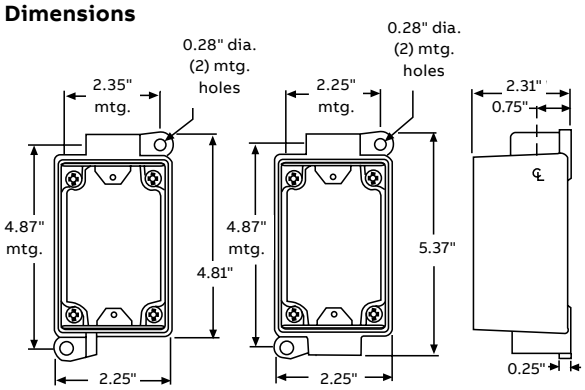
- Aluminum die-cast boxes with cover mounting holes tapped for 6-32 screws to accommodate all FS and FD cover assemblies

Type FSWS and FDWS (with mounting shelf for box-mounted devices)

	Conduit entries	
Cat. no.	Top (in.)	Bottom
FSWS-62	¾	–
FDWS-62	¾	–
FDWS-622	¾	¾
FDWS-63	1	–
FDWS-633	1	1

* Furnished complete with gasket and screws.
Notes: Materials – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish; cast brass, natural finish.
Boxes – Aluminum die-cast, corrosion-resistant copper-free alloy, epoxy powder-coat finish.
Outlets – Standard as listed.
Mounting – All of the above boxes are for surface mounting.

Dimensions



FS/FD™ metallic connections

Marine/Industrial series – 20 and 30 A, 250 V AC

Mechanically interlocked FS/FD interface receptacle outlets, available through 30 A 250 V AC, provide added electrical safety in branch circuits.

By design, the plug must be fully inserted into the interlocked receptacle before the switch or circuit breaker can be turned to the “ON” position, and the switch or circuit breaker must be in the “OFF” position before the plug can be withdrawn. This design ensures that when properly installed and operated, the circuit is made and broken by the switch or circuit breaker, not by the connectors.

As with all Russellstoll products, mechanically interlocked receptacles were designed with safety, durability and performance in mind.

Safety
- Mechanical linkage prevents plug insertion or withdrawal unless switch is in “off” position
- Circuit breaker protection available on many models
- Ground contacts “make first,” “break last”

Durability
- Constructed of copper-free cast aluminum (some types available in brass)
- Sturdy die-cast and sand-cast housings

Performance
- Precision-made, self-aligning and self-wiping contacts
- Receptacles provided with spring-actuated, self-closing flaps
- Devices available in watertight and weathertight versions
- Solderless screw terminals for convenient wiring

FS/FD™ metallic connections

Mechanically interlocked receptacles

Rating:
- 20 A/600 V AC
- 30 A/250 V AC

Mechanically interlocked receptacle with switch

Poles/ wires	Aluminum receptacle w/box**	FS/FD plug	Brass receptacle w/box	FS/FD plug	DuraGard® plug	Bushing I.D. (in.)
2P3W	F20493C	3750	1593LP	3750B	9P33UØ	⅝
3P4W	F20493A**	3760	1594LP	3760B	9P34UØ	¾

** For flap cover brass version, add -B suffix.

Rating:
- 20 A/250 V AC
- 30 A/250 V AC

Mechanically interlocked receptacle with circuit breaker

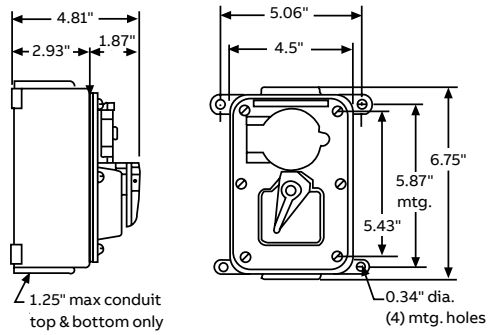
Poles/ wires	Trip rating	Aluminum receptacle w/box	FS/FD plug	DuraGard plug	Bushing I.D. (in.)
2P3W	20 A	F33048B	3750	9P33UØ	⅝
	30 A	F33048C	3750		
3P4W	20 A	F33054B	3760	9P34UØ	¾
	30 A	F33054C	3760		
50 A, 250 V* 3P4W	50 A	C1479AH	3760	9P34UØ*	⅞

* Consult technical services for all 50 A trip applications (30 A device, 50 A trip). Also see DuraGard® Interlocks. For brass versions, contact Technical Services.
Note: For panel mounting or cover assemblies only, please consult your ABB representative.

FS/FD™ metallic connections
Dimensions

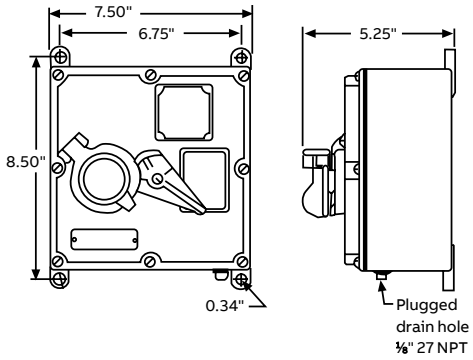
Specifications
- Housings: cast brass, natural finish; cast aluminum, corrosion-resistant copper-free alloy, epoxy powder coat finish
- Cable bushings: oil-resistant, Neoprene strain-relief cable bushings regularly furnished with hole size as listed for plug; other hole sizes available if specified on order; see accessory reference section, bushing sizes on page 90
- Outlets: Unless otherwise specified, boxes are furnished blank
- Receptacle interlocked with switch: maximum conduit outlets 1¾" top and bottom; specify outlets required
- Receptacle interlocked with circuit breaker: maximum conduit outlet 1¾" at locations V, W, X, Y and Z as per diagram; specify outlets required, use symbols

Interlocked with switch, surface mount

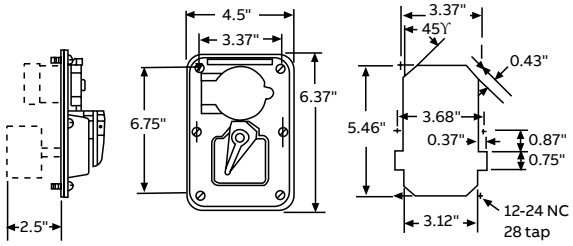


Cat. no. F18196B&C and F20493A&B

Interlocked with circuit breaker

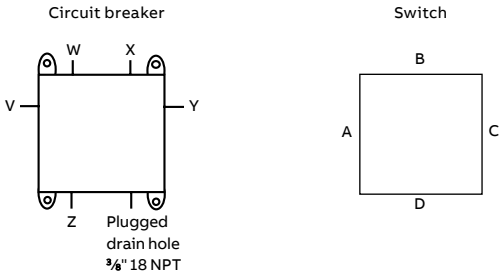


Machine panel mount

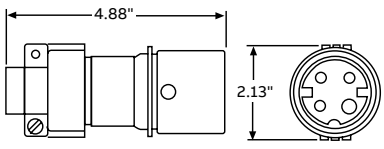


(also as replacement cover assembly)

Floor extension mount



Standard plug



20/30 A FS/FD™

Standard plug

Amps		A	B	C
30	Inches	5.38	2.38	4.16
	mm	136.6	60.5	105.7
50	Inches	5.75	2.38	4.16
	mm	146.1	60.5	105.7

Dimensions

30/50 A DuraGard®

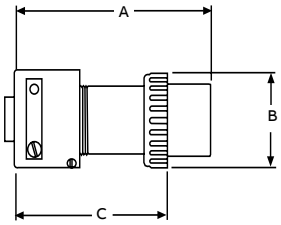


ABB IEC 60 309 international pin and sleeve

Approved according to IEC 60 309-1, -2, -4 - range from 16 up to 125 A, up to 600 V, watertight to IP67 and IP69K

Safety

- **Proven performance:** With more than 30 years of experience, ABB IEC pin and sleeve connectors are the brand of choice around the globe
- **Added safety measures:** Plugs and connectors are equipped with a double cable clamp system to prevent cable detachment and provide a higher level of cable strain relief
- **Safe connections:** Mechanical interlocks guarantee no access to plug insertion or removal until power is off

Durability

- **Designed for durability:** The housings are made of thermoplastic polyester (PBT) grade Valox® 357 material, which guarantees highest possible durability in this industry
- **Superb ingress protection:** IP69K rated to withstand high pressure steamjet washdown
- **Built to last:** Interconnectors are highly resistant to chemicals like mineral and organic acid, organic solvents and petroleum. All external screws are made of stainless steel to prevent corrosion.
- **Reinforced for high reliability:** The contact carrier is made of fiberglass-reinforced nylon material for sizes between 60 A–125 A, which reduces the need for and expense of replacement parts

Performance

- **Continuing operation:** The self-cleaning pin and sleeve design keeps the connection resistance on the lowest level, reducing down time
- **Long lasting:** Machine-calibrated sleeves with stainless steel springs provide accurate contact pressure over time
- **Resilience:** Corrosion-resistant steel screws at terminals provide clamping pressure over time
- **Easy installation:** Clear terminal markings inside and at the front of the devices

Valox is a registered trademark of SABIC.

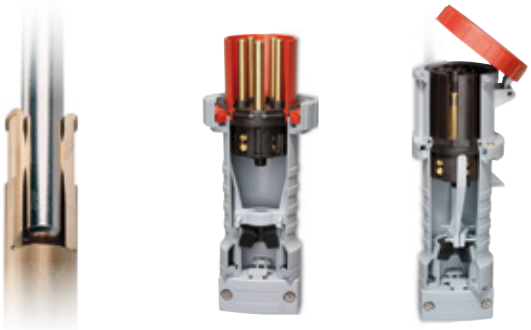
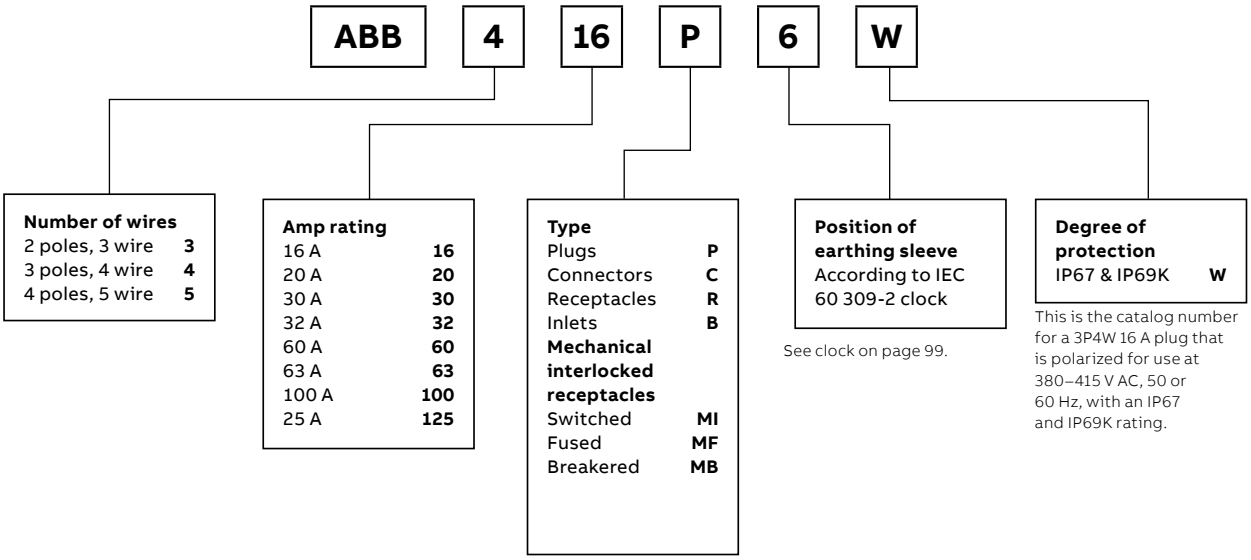


ABB IEC 60 309 international pin and sleeve

Part number configuration

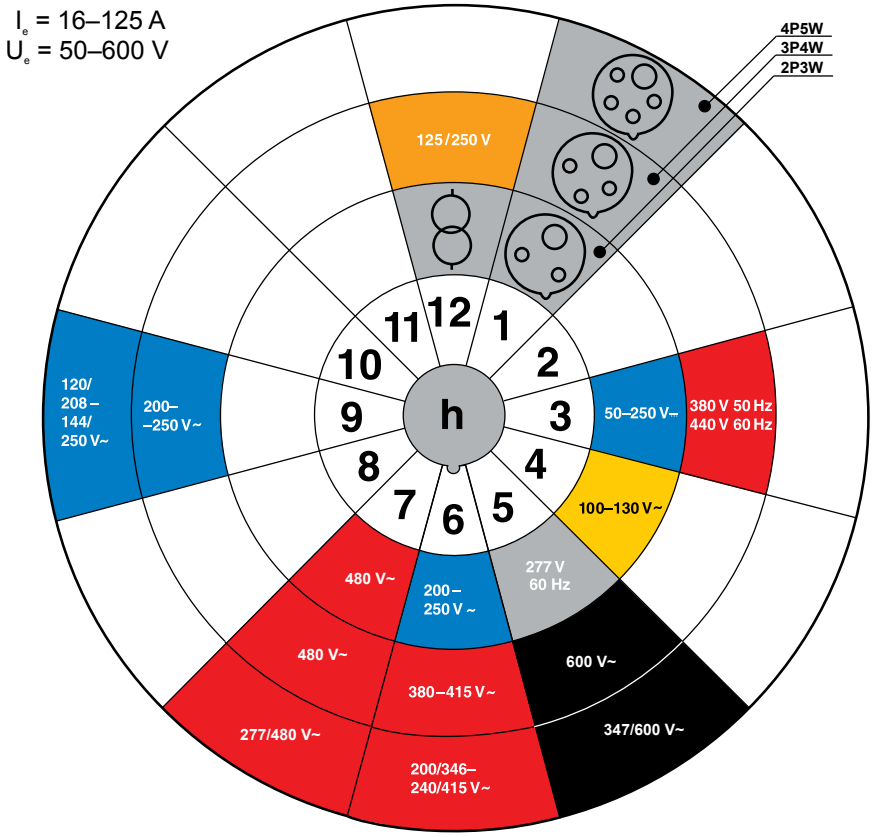


See clock on page 99.

This is the catalog number for a 3P4W 16 A plug that is polarized for use at 380–415 V AC, 50 or 60 Hz, with an IP67 and IP69K rating.

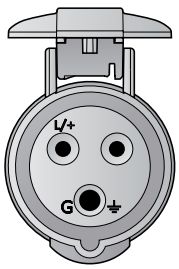
ABB IEC 60 309 international pin and sleeve

IEC 60 309-2 clock

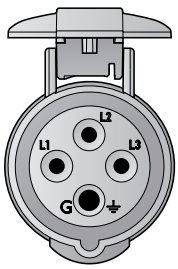


Standard voltages
Color codes according to IEC 60 309-1, -2

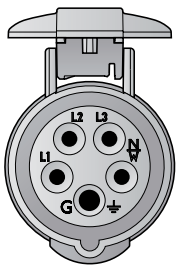
Position of earthing sleeve according to IEC 60309-2 (clock)	2P3W	3P4W	4P5W
1	Optional voltage (not stated below)	Optional voltage (not stated below)	Optional voltage (not stated below)
3	50–250 V DC	380 V 50 Hz to 440 V 60 Hz	–
4	100–130 V 50/60 Hz	–	–
5	277 V 60 Hz	600 V 50/60 Hz	347/600 V 50/60 Hz
6	200–250 V 50/60 Hz	380–415 V 50/60 Hz	200/346–240/415 V 50/60 Hz
7	480 V 50/60 Hz	480 V 50/60 Hz	277/480 V 50/60 Hz
9	–	200–250 V 50/60 Hz	120/208–144/250 V 50/60 Hz
12	Supply from isolating transformer	125/250 V	



2P3W



3P4W



4P5W

ABB IEC 60 309 international pin and sleeve

Pin and sleeve plugs & connectors

Pin and sleeve plugs & connectors are for applications in environments that have high demand of functionality and safety. The robust housing is made of thermoplastic polyester (PBT) grade Valox® 357 material. The product is available as watertight (IP67 & IP69K). The devices are equipped with internal and external cable clamps. The 60 A–125 A devices are equipped with two screws on each terminal.

Features
- IP67 & IP69K watertight
- 16–125 A, 50–600 V AC
- IEC 60 309-1, -2
- All external screws are made of stainless steel

Application examples
- Food & beverage
- Harbors/shipyards
- Mines
- Industry/workshops

Clear marking, at the front and the rear of the terminals
Ground ⏚
Neutral N
Phase L1, L2, L3

External screws made of stainless steel

Internal and external cable clamp

Clean brass pins

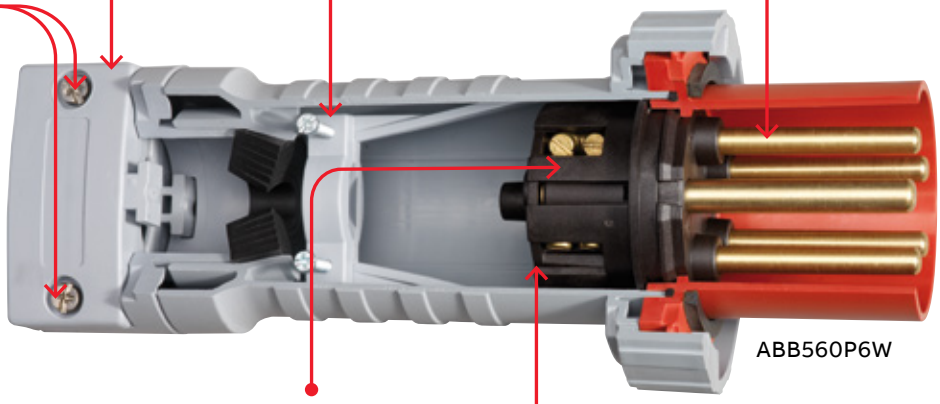


ABB560P6W

Two screws at each terminal to assure safe and reliable cable connection (on 60 A–125 A product; lower amperages have a single screw)

Robust plastic housing that withstands most chemicals found in industrial environments

Rear terminals, raised lettering, identification contacts

Spring loaded replaceable lid covers

Watertight chloroprene onion skin grommet

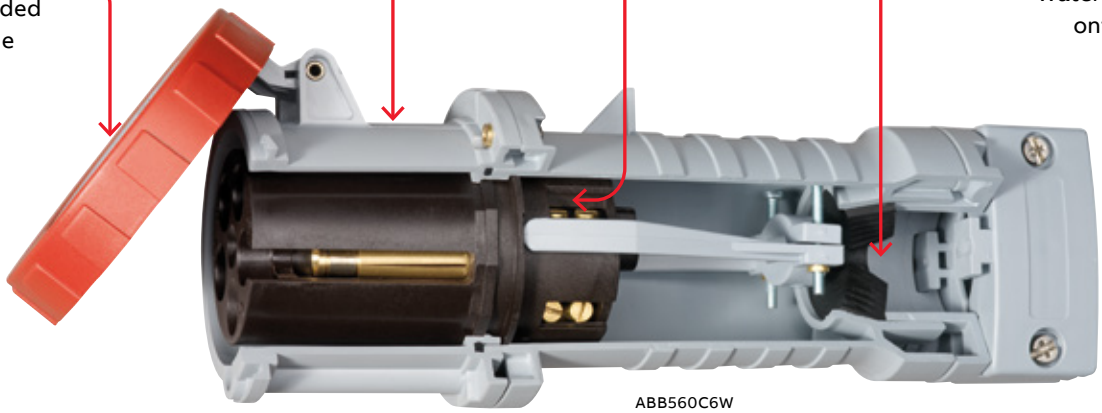


ABB560C6W

Valox is a registered trademark of SABIC.

ABB IEC 60 309 international pin and sleeve

IP67 & IP69K rated (watertight)

IP67 & IP69K rated (watertight)

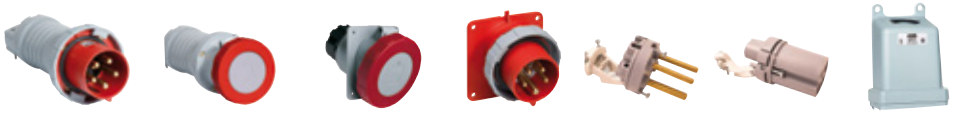
Amps	Poles & wires	Voltage (V AC*)	Clock hour	Plug	Connector	Receptacle	Inlet	Plug insert	Connector insert	Back box
16	2P3W	100–130	4h	ABB316P4W	ABB316C4W	ABB316R4W	ABB316B4W	–	–	BB 30
	2P3W	200–250	6h	ABB316P6W	ABB316C6W	ABB316R6W	ABB316B6W	–	–	BB 30
	3P4W	380–415	6h	ABB416P6W	ABB416C6W	ABB416R6W	ABB416B6W	IN420P	IN420C	BB 30
	4P5W	200/346–240/415	6h	ABB516P6W	ABB516C6W	ABB516R6W	ABB516B6W	–	–	BB 30
20	2P3W	100–130	4h	ABB320P4W	ABB320C4W	ABB320R4W	ABB320B4W	–	–	BB 30
	2P3W	200–250	6h	ABB320P6W	ABB320C6W	ABB320R6W	ABB320B6W	–	–	BB 30
	2P3W	277	5h	ABB320P5W	ABB320C5W	ABB320R5W	ABB320B5W	–	–	BB 30
	2P3W	480	7h	ABB320P7W	ABB320C7W	ABB320R7W	ABB320B7W	–	–	BB 30
	3P4W	125/250	12h	ABB420P12W	ABB420C12W	ABB420R12W	ABB420B12W	IN420P	IN420C	BB 30
	3P4W	3Ø 200–250	9h	ABB420P9W	ABB420C9W	ABB420R9W	ABB420B9W	IN420P	IN420C	BB 30
	3P4W	3Ø 480	7h	ABB420P7W	ABB420C7W	ABB420R7W	ABB420B7W	IN420P	IN420C	BB 30
	3P4W	3Ø 600	5h	ABB420P5W	ABB420C5W	ABB420R5W	ABB420B5W	IN420P	IN420C	BB 30
	4P5W	3ØY 120/208–144/250	9h	ABB520P9W	ABB520C9W	ABB520R9W	ABB520B9W	IN520P	IN520C	BB 30
	4P5W	3ØY 277/480	7h	ABB520P7W	ABB520C7W	ABB520R7W	ABB520B7W	IN520P	IN520C	BB 30
	4P5W	3ØY 347/600	5h	ABB520P5W	ABB520C5W	ABB520R5W	ABB520B5W	IN520P	IN520C	BB 30
30	2P3W	100–130	4h	ABB330P4W	ABB330C4W	ABB330R4W	ABB330B4W	IN330P	IN330C	BB 30
	2P3W	200–250	6h	ABB330P6W	ABB330C6W	ABB330R6W	ABB330B6W	IN330P	IN330C	BB 30
	2P3W	277	5h	ABB330P5W	ABB330C5W	ABB330R5W	ABB330B5W	IN330P	IN330C	BB 30
	2P3W	480	7h	ABB330P7W	ABB330C7W	ABB330R7W	ABB330B7W	IN330P	IN330C	BB 30
	3P4W	125/250	12h	ABB430P12W	ABB430C12W	ABB430R12W	ABB430B12W	IN430P	IN430C	BB 30
	3P4W	3Ø 200–250	9h	ABB430P9W	ABB430C9W	ABB430R9W	ABB430B9W	IN430P	IN430C	BB 30
	3P4W	3Ø 480	7h	ABB430P7W	ABB430C7W	ABB430R7W	ABB430B7W	IN430P	IN430C	BB 30
	3P4W	3Ø 600	5h	ABB430P5W	ABB430C5W	ABB430R5W	ABB430B5W	IN430P	IN430C	BB 30
	4P5W	3ØY 120/208–144/250	9h	ABB530P9W	ABB530C9W	ABB530R9W	ABB530B9W	IN530P	IN530C	BB 30
	4P5W	3ØY 277/480	7h	ABB530P7W	ABB530C7W	ABB530R7W	ABB530B7W	IN530P	IN530C	BB 30
	4P5W	3ØY 347/600	5h	ABB530P5W	ABB530C5W	ABB530R5W	ABB530B5W	IN530P	IN530C	BB 30
32	2P3W	100–130	4h	ABB332P4W	ABB332C4W	ABB332R4W	ABB332B4W	IN330P	IN330C	BB 30
	2P3W	200–250	6h	ABB332P6W	ABB332C6W	ABB332R6W	ABB332B6W	IN330P	IN330C	BB 30
	3P4W	380–415	6h	ABB432P6W	ABB432C6W	ABB432R6W	ABB432B6W	IN430P	IN430C	BB 30
	3P4W	380 50 Hz/440 60 Hz	3h	ABB432P3W	ABB432C3W	ABB432R3W	ABB432B3W	IN430P	IN430C	BB 30
	4P5W	200/346–240/415	6h	ABB532P6W	ABB532C6W	ABB532R6W	ABB532B6W	IN530P	IN530C	BB 30

* Unless otherwise noted.

ABB IEC 60 309 international pin and sleeve

IP67 & IP69K rated (watertight)

IP67 and IP69K rated (watertight)



Amps	Poles & wires	Voltage (V AC*)	Clock hour	Plug	Connector	Receptacle	Inlet	Plug insert	Connector insert	Back box
60	2P3W	100–130	4h	ABB360P4W	ABB360C4W	ABB360R4W	ABB360B4W	IN360P4	IN360C4	BB 60
	2P3W	200–250	6h	ABB360P6W	ABB360C6W	ABB360R6W	ABB360B6W	–	–	BB 60
	2P3W	277	5h	ABB360P5W	ABB360C5W	ABB360R5W	ABB360B5W	IN360P5	IN360C5	BB 60
	2P3W	480	7h	ABB360P7W	ABB360C7W	ABB360R7W	ABB360B7W	IN360P7	IN360C7	BB 60
	2P3W	50–250VDC	3h	ABB360P3W	ABB360C3W	ABB360R3W	ABB360B3W	IN360P3	IN360C3	BB 60
	3P4W	125/250	12h	ABB460P12W	ABB460C12W	ABB460R12W	ABB460B12W	IN460P12	IN460C12	BB 60
	3P4W	3Ø 200–250	9h	ABB460P9W	ABB460C9W	ABB460R9W	ABB460B9W	IN460P9	IN460C9	BB 60
	3P4W	3Ø 480	7h	ABB460P7W	ABB460C7W	ABB460R7W	ABB460B7W	IN460P7	IN460C7	BB 60
	3P4W	3Ø 600	5h	ABB460P5W	ABB460C5W	ABB460R5W	ABB460B5W	IN460P5	IN460C5	BB 60
	4P5W	3ØY 120/208–144/250	9h	ABB560P9W	ABB560C9W	ABB560R9W	ABB560B9W	IN560P9	IN560C9	BB 60
	4P5W	3ØY 277/480	7h	ABB560P7W	ABB560C7W	ABB560R7W	ABB560B7W	IN560P7	IN560C7	BB 60
	4P5W	3ØY 347/600	5h	ABB560P5W	ABB560C5W	ABB560R5W	ABB560B5W	IN560P5	IN560C5	BB 60
63	2P3W	200–250	6h	ABB363P6W	ABB363C6W	ABB363R6W	ABB363B6W	–	–	BB 60
	3P4W	380–415	6h	ABB463P6W	ABB463C6W	ABB463R6W	ABB463B6W	–	–	BB 60
	4P5W	200/346–240/415	6h	ABB563P6W	ABB563C6W	ABB563R6W	ABB563B6W	–	–	BB 60
100	2P3W	100–130	4h	ABB3100P4W	ABB3100C4W	ABB3100R4W	ABB3100B4W	IN3100P4	IN3100C4	BB 100
	2P3W	200–250	6h	ABB3100P6W	ABB3100C6W	ABB3100R6W	ABB3100B6W	IN3100P6	IN3100C6	BB 100
	2P3W	277	5h	ABB3100P5W	ABB3100C5W	ABB3100R5W	ABB3100B5W	IN3100P5	IN3100C5	BB 100
	2P3W	480	7h	ABB3100P7W	ABB3100C7W	ABB3100R7W	ABB3100B7W	IN3100P7	IN3100C7	BB 100
	3P4W	125/250	12h	ABB4100P12W	ABB4100C12W	ABB4100R12W	ABB4100B12W	IN4100P12	IN4100C12	BB 100
	3P4W	3Ø 200–250	9h	ABB4100P9W	ABB4100C9W	ABB4100R9W	ABB4100B9W	IN4100P9	IN4100C9	BB 100
	3P4W	3Ø 480	7h	ABB4100P7W	ABB4100C7W	ABB4100R7W	ABB4100B7W	IN4100P7	IN4100C7	BB 100
	3P4W	3Ø 600	5h	ABB4100P5W	ABB4100C5W	ABB4100R5W	ABB4100B5W	IN4100P5	IN4100C5	BB 100
	4P5W	3ØY 120/208–144/250	9h	ABB5100P9W	ABB5100C9W	ABB5100R9W	ABB5100B9W	IN5100P9	IN5100C9	BB 100
	4P5W	3ØY 277/480	7h	ABB5100P7W	ABB5100C7W	ABB5100R7W	ABB5100B7W	IN5100P7	IN5100C7	BB 100
	4P5W	3ØY 347/600	5h	ABB5100P5W	ABB5100C5W	ABB5100R5W	ABB5100B5W	IN5100P5	IN5100C5	BB 100
125	2P3W	200–250	6h	ABB3125P6W	ABB3125C6W	ABB3125R6W	ABB3125B6W	IN3100P6	IN3100C6	BB 100
	3P4W	380–415	6h	ABB4125P6W	ABB4125C6W	ABB4125R6W	ABB4125B6W	–	–	BB 100
	4P5W	200/346–240/415	6h	ABB5125P6W	ABB5125C6W	ABB5125R6W	ABB5125B6W	–	–	BB 100

* Unless otherwise noted.

ABB IEC 60 309 international pin and sleeve

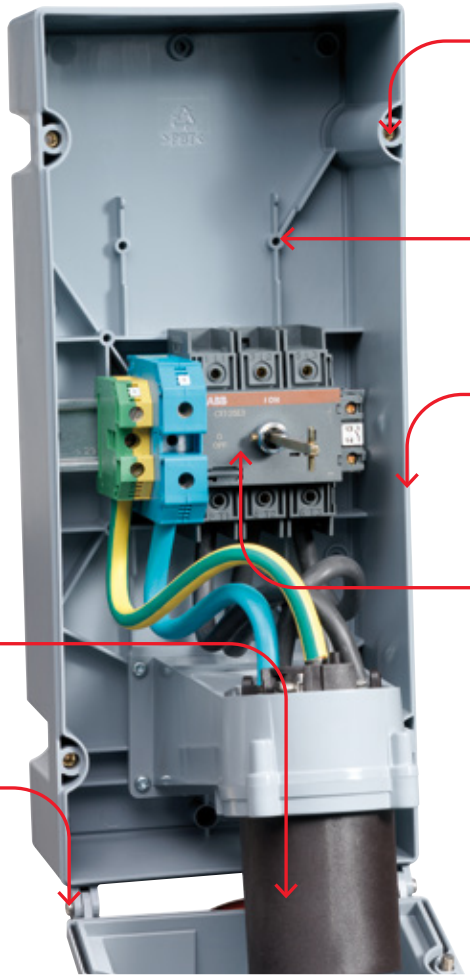
Mechanical interlocks

Mechanical Interlocks are used in applications with high demands on safety, durability and performance. Perfect for applications with frequent connection/disconnection, and to use in public areas.

The housing is made of thermoplastic polyester (PBT) grade Valox® 357 material, which is a tough plastic that withstands heavy-duty usage and most chemicals found in industrial environments.

Features
- IP67 watertight
- 16–125 A, 50–600 V AC
- IEC 60 309-2, -4
- All external screws are made of stainless steel

Application examples
- Chemical industry
- Sawmills
- Airports
- Hospitals



Clear terminal marking, inside and outside the box
Ground ⏚
Neutral N
Phase L1, L2, L3

Cover and mounting screws made of stainless steel

Brass threaded inserts

Padlockable handle

Space for wiring and easy access for cables

Material that withstands heavy-duty usage and most chemicals found in industrial environments

Mechanically interlocked to prevent making and breaking under load

Pre-wired IEC receptacle accepts all manufacturer's IEC 60 309-2 plugs

Robust hinge mechanism pivots >120° for easy access during installation and maintenance

ABB4100MI6W

Valox is a registered trademark of SABIC.

ABB IEC 60 309 international pin and sleeve

IP67 and IP69K rated (watertight)




IP67 and IP69K rated (watertight)

Amps	Poles & wires	Voltage (V AC)	Clock hour	Switched	Fused	Breakered	Mating plug
20	2P3W	200–250	6h	ABB320MI6W	–	–	ABB320P6W
	2P3W	480	7h	ABB320MI7W	–	–	ABB320P7W
	3P4W	125/250	12h	ABB420MI12W	ABB420MF12W	–	ABB420P12W
	3P4W	3Ø 200–250	9h	ABB420MI9W	ABB420MF9W	–	ABB420P9W
	3P4W	3Ø 480	7h	ABB420MI7W	ABB420MF7W	–	ABB420P7W
	3P4W	3Ø 600	5h	ABB420MI5W	ABB420MF5W	–	ABB420P5W
	4P5W	3ØY 120/208–144/250	9h	ABB520MI9W	–	–	ABB520P9W
	4P5W	3ØY 277/480	7h	ABB520MI7W	–	–	ABB520P7W
	4P5W	3ØY 347/600	5h	ABB520MI5W	–	–	ABB520P5W
30	2P3W	100–130	4h	ABB330MI4W	–	–	ABB330P4W
	2P3W	200–250	6h	ABB330MI6W	–	–	ABB330P6W
	2P3W	480	7h	ABB330MI7W	–	–	ABB330P7W
	3P4W	125/250	12h	ABB430MI12W	ABB430MF12W	–	ABB430P12W
	3P4W	3Ø 200–250	9h	ABB430MI9W	ABB430MF9W	–	ABB430P9W
	3P4W	3Ø 480	7h	ABB430MI7W	ABB430MF7W	–	ABB430P7W
	3P4W	3Ø 600	5h	ABB430MI5W	ABB430MF5W	–	ABB430P5W
	4P5W	3ØY 120/208–144/250	9h	ABB530MI9W	–	–	ABB530P9W
	4P5W	3ØY 277/480	7h	ABB530MI7W	ABB530MF7W	–	ABB530P7W
	4P5W	3ØY 347/600	5h	ABB530MI5W	ABB530MF5W	–	ABB530P5W
32	3P4W	380 50 Hz/440 60 Hz	3h	ABB432MI3W	–	–	ABB332P3W
60	2P3W	100–130	4h	ABB360MI4W	–	–	ABB360P4W
	2P3W	200–250	6h	ABB360MI6W	ABB360MF6W	–	ABB360P6W
	2P3W	480	7h	ABB360MI7W	–	–	ABB360P7W
	3P4W	125/250	12h	ABB460MI12W	ABB460MF12W	–	ABB460P12W
	3P4W	3Ø 200–250	9h	ABB460MI9W	ABB460MF9W	–	ABB460P9W
	3P4W	3Ø 480	7h	ABB460MI7W	ABB460MF7W	–	ABB460P7W
	3P4W	3Ø 600	5h	ABB460MI5W	ABB460MF5W	–	ABB460P5W
	4P5W	3ØY 120/208–144/250	9h	ABB560MI9W	ABB560MF9W	–	ABB560P9W
	4P5W	3ØY 277/480	7h	ABB560MI7W	–	–	ABB560P7W
	4P5W	3ØY 347/600	5h	ABB560MI5W	–	–	ABB560P5W
100	2P3W	100–130	4h	ABB3100MI4W	–	–	ABB3100P4W
	2P3W	200–250	6h	ABB3100MI6W	–	–	ABB3100P6W
	2P3W	480	7h	ABB3100MI7W	–	–	ABB3100P7W
	3P4W	125/250	12h	ABB4100MI12W	–	ABB4100MB12W	ABB4100P12W
	3P4W	3Ø 200–250	9h	ABB4100MI9W	–	ABB4100MB9W	ABB4100P9W
	3P4W	3Ø 480	7h	ABB4100MI7W	–	ABB4100MB7W	ABB4100P7W
	3P4W	3Ø 600	5h	ABB4100MI5W	–	–	ABB4100P5W
	4P5W	3ØY 120/208–144/250	9h	ABB5100MI9W	–	ABB5100MB9W	ABB5100P9W
	4P5W	3ØY 277/480	7h	ABB5100MI7W	–	ABB5100MB7W	ABB5100P7W

ABB IEC 60 309 international pin and sleeve

- Lockout/tagout for plugs and inlets. Can be used for any IEC 60309-1 and 60309-2 plug or inlet.

Accessories – Plugblocker

To fit	Cat. no.
Plugs 16–125 A Panel-mounted inlets 16–125 A Surface-mounted inlets 16–125 A	CLF20–100

- Material in EPDM rubber

Accessories – Protective cover 16–125 A, IP67

For inlet and plug	Cat. no.
16 A & 20 A, 2P3W	ABB GP320
16 A & 20 A, 3P4W	ABB GP420
16 A & 20 A, 4P5W	ABB GP520
30 A & 32 A, 2P3W and 3P4W	ABB GP330/430
30 A & 32 A, 4P5W	ABB GP530
60 A & 63 A, 2P3W, 3P4W and 4P5W	ABB GP60
100 A & 125 A, 2P3W, 3P4W and 4P5W	ABB GP100

Accessories – Liquidtight adapter and wire mesh

For connector and plug	Liquidtight adapter cat. no.	Wire mesh cat. no.	Liquidtight adapter hub size (in.)
16&20 A 3-4W	LAA12	5332WMG2	½"
16&20 A 5W, 30&32A 3-4W	LAB12	5332WMG2	½"
16&20 A 5W, 30&32A 3-4W	LAB34	5333WMG3	¾"
30&32 A 5W	LAC34	5333WMG3	¾"
30&32 A 5W	LAC100	5334WMG4	1"
60&63 A	LAD125	5335WMG5	1¼"
60&63 A	LAD34	5333WMG3	¾"
100&125 A	LAE125	5335WMG5	1¼"

ABB IEC 60 309 international pin and sleeve

Accessories – Replacement lids for connector and receptacles

For connector and receptacle	Cat. no.
3W 16/20 A	CA320
4W 16/20 A	CA420
5W 16/20 A	CA520
3-4W 30 A	CA343
5W 30 A	CA530
60/63 A	CA060
100 A	CA100

Accessories – 20˚ Metal angle enclosure

For receptacle and inlet	Cat. no.	Hub size (in.)
60/63 A	AE6-B125	1¼
60/63 A	AE6-B150	1½
100 A	AE10-B150	1½
100 A	AE10-B200	2

Accessories – 20˚ Metal angle adapter

For receptacle and inlet	Cat. no.
60/63 A	AA6L
100 A	AA10L

Accessories – Junction box

For receptacle and inlet	Cat. no.	Hub size (in.)
60/63 A	JB6-B125	1¼
60/63 A	JB6-B150	1½
100 A	JB10-B150	1½
100 A	JB10-B200	2

Accessories – Non-metallic backbox adapter

For receptacle and inlet	Cat. no.
60/63 A	BBA60
100/125 A	BBA100

Accessories – Metal backbox adapter

For receptacle and inlet	Cat. no.
16-32 A	MBA3060*
60/63 A	MBA60
100/125 A	MBA100

* Connects to 60 A 20° angle adapter and enclosure

ABB IEC 60 309 international pin and sleeve

Technical data – Watertight products

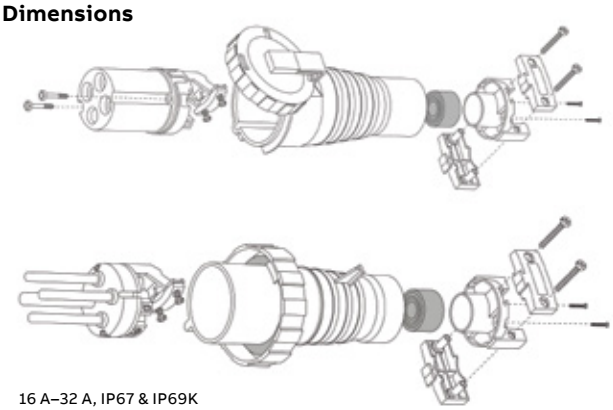
Tightening guide

Device	Terminal screws (in. lbs./nm)	Internal cable clamp screws (in. lbs./nm)	External cable clamp screws (in. lbs./nm)	Assembly screws (in. lbs./nm)
16 A–20 A	7.1/0.8	10.6/1.2	17.7/2.0	10.6/1.2
30 A–32 A	10.6/1.2	10.6/1.2	17.7/2.0	10.6/1.2
60 A–63 A	31/3.5	10.6/1.5	26.6/3.0	10.6/1.2
100 A–125 A	50/5.6	17.7/2.0	26.6/3.0	17.7/2.0

Wire sizes

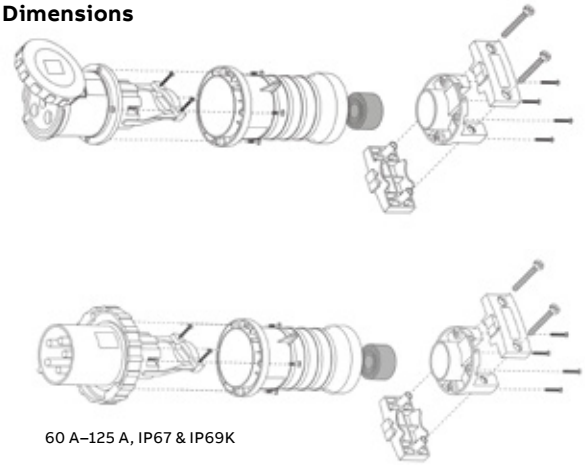
Device	Cable dimension range (in./mm)
16 A–20 A, 2P3W	0.350–0.860/9–22
16 A–20 A, 3P4W	0.350–0.86/9–22
16 A–20 A, 4P5W	0.437–1.187/11–30
30 A–32 A, 2P3W	0.437–1.187/11–30
30 A–32 A, 3P4W	0.437–1.187/11–30
30 A–32 A, 4P5W	0.437–1.450/11–37
60 A–63 A, 2P3W	0.670–1.625/17–41
60 A–63 A, 3P4W	0.670–1.625/17–41
60 A–63 A, 4P5W	0.670–1.625/17–41
100 A–125 A, 2P3W	0.950–1.875/24–48
100 A–125 A, 3P4W	0.950–1.875/24–48
100 A–125 A, 4P5W	0.950–1.875/24–48

Dimensions



16 A–32 A, IP67 & IP69K

Dimensions



60 A–125 A, IP67 & IP69K

ABB IEC 60 309 international pin and sleeve

Dimensions

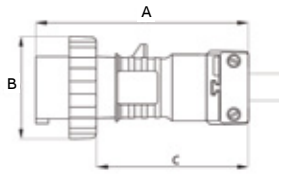
Plugs

Type	A (in./mm)	B (in./mm)	C (in./mm)	D max (in./mm)
16 A–20 A, 2P3W	5.81/147.5	2.80/71	4.47/113.5	0.51/13
16 A–20 A, 3P4W	6.46/164	3.11/79	5.16/131	0.67/17
16 A–20 A, 4P5W	6.61/168	3.43/87	5.28/134	0.67/17
30 A–32 A, 2P3W	6.85/174	3.70/94	4.74/120.5	0.85/21.5
30 A–32 A, 3P4W	6.85/174	3.70/94	5.41/137.5	0.85/21.5
30 A–32 A, 4P5W	7.40/188	3.98/101	5.47/139	0.85/21.5
60 A–63 A, All	10.83/275	4.49/114	8.39/213	1.61/41
100 A–125 A, All	12.32/313	5.12/130	9.53/242	1.89/48

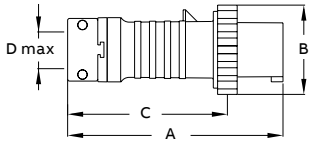
Connectors

Type	A (in./mm)	B (in./mm)	D max (in./mm)
16 A–20 A, 2P3W	6.73/171	3.15/80	0.51/13
16 A–20 A, 3P4W	7.40/188	3.46/88	0.67/17
16 A–20 A, 4P5W	7.68/195	3.82/97	0.67/17
30 A–32 A, 2P3W	7.76/197	3.94/100	0.85/21.5
30 A–32 A, 3P4W	7.76/197	3.94/100	0.85/21.5
30 A–32 A, 4P5W	8.27/210	4.29/109	0.85/21.5
60 A–63 A, All	11.26/286	4.37/111	1.61/41
100 A–125 A, All	12.80/325	4.80/122	1.89/48

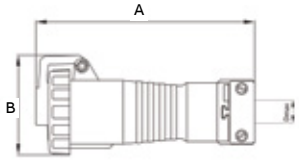
Dimensions



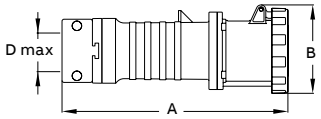
16 A–32 A



60 A–125 A



16 A–32 A

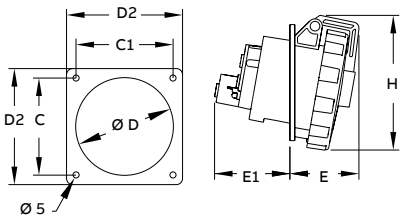


60 A–125 A

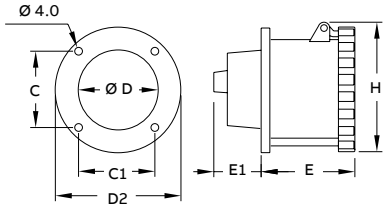
Receptacles

Type	C (in./mm)	C1 (in./mm)	D (in./mm)	D2 (in./mm)	E (in./mm)	E1 (in./mm)	H (in./mm)
16 A–20 A, 2P3W	3.13/79.5	3.13/79.5	3.27/83	3.74/95	1.77/45	2.24/57	3.74/95
16 A–20 A, 3P4W	3.13/79.5	3.13/79.5	3.27/83	3.74/95	1.77/45	2.24/57	3.74/95
16 A–20 A, 4P5W	3.13/79.5	3.13/79.5	3.27/83	3.74/95	1.85/47	2.24/57	3.90/99
30 A–32 A, 2P3W	3.13/79.5	3.13/79.5	3.27/83	3.74/95	2.20/56	2.40/61	4.09/104
30 A–32 A, 3P4W	3.13/79.5	3.13/79.5	3.27/83	3.74/95	2.20/56	2.40/61	4.09/104
30 A–32 A, 4P5W	3.13/79.5	3.13/79.5	3.27/83	3.74/95	2.20/56	2.44/62	4.37/111
60 A–63 A, All	2.40/61	2.40/61	2.76/70	4.09/104	3.50/89	1.89/48	4.37/111
100 A–125 A, All	2.80/71	2.80/71	3.46/88	4.53/115	3.94/100	2.28/58	4.80/122

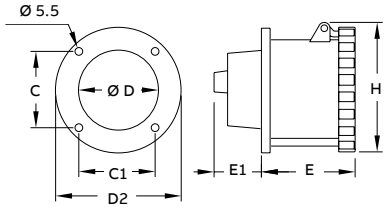
Dimensions



16 A–32 A



60 A–63 A



100 A–125 A

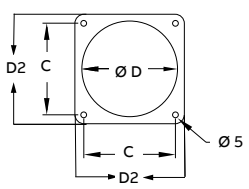
ABB IEC 60 309 international pin and sleeve

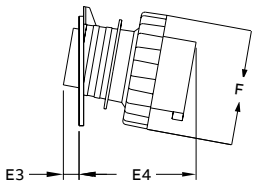
Dimensions

Inlets

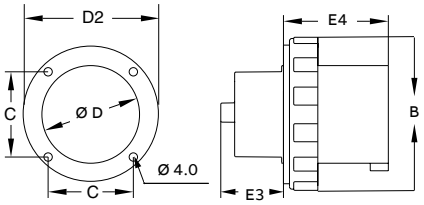
Type	C (in./mm)	D (in./mm)	D2 (in./mm)	E3 (in./mm)	E4 (in./mm)	F (in./mm)
16 A–20 A, 2P3W	3.13/79.5	3.27/83	3.74/95	0.40/10	1.85/47	2.80/71
16 A–20 A, 3P4W	3.13/79.5	3.27/83	3.74/95	0.40/10	2.09/53	3.11/79
16 A–20 A, 4P5W	3.13/79.5	3.27/83	3.74/95	0.40/10	3.43/87	3.43/87
30 A–32 A, 2P3W	3.13/79.5	3.27/83	3.74/95	0.47/12	2.36/60	3.70/94
30 A–32 A, 3P4W	3.13/79.5	3.27/83	3.74/95	0.47/12	2.36/60	3.70/94
30 A–32 A, 4P5W	3.13/79.5	3.27/83	3.74/95	0.47/12	2.64/67	3.98/101
60 A–63 A, All	4.41/112	2.40/61	2.76/70	3.86/98	1.97/50	3.15/80
100 A–125 A, All	4.80/122	2.80/71	3.19/81	4.65/118	2.20/56	3.50/89

Dimensions

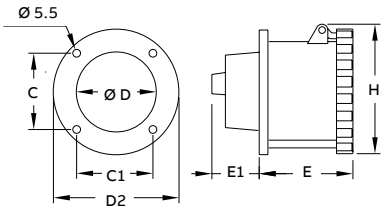




16 A–32 A

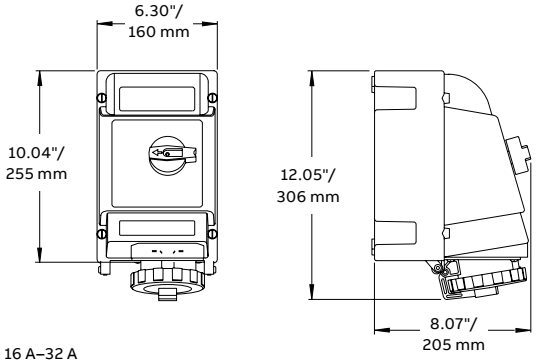


60 A–63 A

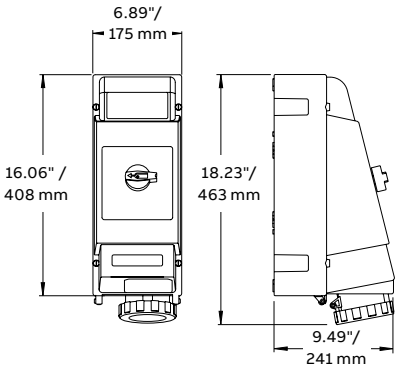


100 A–125 A

Mechanical interlocks: switched (MI), fused (MF) and/or breakered (MB)



16 A–32 A



60 A–125 A

ABB IEC 60 309 international pin and sleeve

Dimensions

20° Angle enclosures*

Cat. no.	Conduit size (in.)	Use	A		B		C		D		E		F		G
			inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	mm
AE6-B125	1¼	60 A Devices	5.13	130	1.41	36	2.05	52	5.62	143	5.00	127	.28	7	3.00	76	
AE6-B150	1½	60 A Devices	5.13	130	1.41	36	2.05	52	5.62	143	5.00	127	.28	7	3.00	76	
AE10-B150	1½	100 A Devices	7.05	179	1.81	46	2.68	68	6.88	175	5.50	140	.34	9	4.00	102	
AE10-B200	2	100 A Devices	7.05	179	1.81	46	2.68	68	6.88	175	5.50	140	.34	9	4.00	102	

* For use where there is no existing ABB Russellstoll JB series junction box installed. For 20/30 A inlets, use 60 A size.

20° Angle adapters*

Cat. no.	Use	A		B		C		D		E		F	
		inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
AA6L	60 A Devices	5.23	133	4.00	102	5.43	138	4.88	124	3.44	87	4.81	122
AA10L	100 A Devices	7.36	187	5.50	140	5.50	140	6.00	152	4.84	124	4.87	124

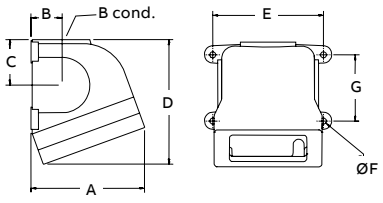
* To be used with JB series junction boxes or panel mount. For 20/30 A inlets, use 60 A size.

Rectangular junction boxes*

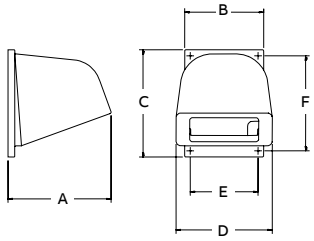
Cat. no.	Conduit size (in.)	Use	A		B		C		D		E		F		G
			inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	mm
JB6-B125	1¼	60 A Devices	4.00	102	5.63	143	4.94	125	3.81	97	.34	9	3.00	76	1.50	38	
JB6-B150	1½	60 A Devices	4.00	102	5.63	143	4.94	125	3.81	97	.34	9	3.00	76	1.50	38	
JB10-B150	1½	100 A Devices	5.50	140	5.50	140	4.25	108	6.75	171	.34	9	3.75	95	2.00	51	
JB10-B200	2	100 A Devices	5.50	140	5.50	140	4.25	108	6.75	171	.34	9	3.75	95	2.00	51	

* Unless otherwise specified, junction boxes are furnished with one conduit size at location B. To be used with AA series angle adapters. For 20/30 A inlets, use 60 A size.

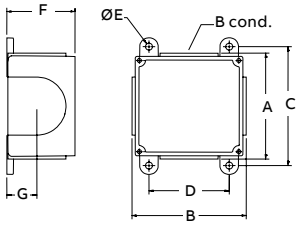
Dimensions



Angle enclosure



Angle adapter



Junction box

ABB IEC 60 309 international pin and sleeve

Plugs, connectors, receptacles and inlets

Performance – Electrical

Application	Performance
Dielectric voltage withstand	3000 V for 1 minute (devices > 300 V)
	2000 V for 1 minute (devices ≤ 300 V)
Maximum working voltage	600 V AC/250 V DC (minimum creepage and clearances per UL 840)
Current interrupting/ load breaking	Tested to 150% of full rated current for circuit interrupting
Temperature rise	Maximum 30 °C rise at full rated current after 50 cycles overload at 150% rated load at 0.75 pF
Endurance with load per IEC 60 309-1 clause 21	20 A: 5000 cycles – Rated current, voltage
	30 A: 1000 cycles – Rated current, voltage
	60 A: 1000 cycles – Rated current, voltage
	100 A: 250 cycles – Rated current, voltage

Performance – Mechanical

Application	Performance
Cold (-25 °C) impact resistance	Per UL 1682 Section 34 and IEC 60 309-1 Clause 24
Cable O.D. accommodation	Round portable service cord from 0.57" O.D. through 1.79" O.D.
Terminal identification	In accordance with UL 1682 standards and wIEC 60 309-1: as L1-L2-L3-N-G
Cable pull-out force	Per UL 1682 Section 33 and IEC 60 309-1 Clause 23
Product identification	Product trademark(s) and UL approved product label

Performance – Environmental

Application	Performance
Moisture resistance	Watertight to IP67 & IP69K
Flammability	All components V2 for internal parts & V0 for external parts on 20 A & 30 A devices per UL94 or CSA 22.2 No. 0.6; V0 on 60 A & 100 A
Operating temperature	-55 °C/-67 °F minimum to 55 °C/131 °F maximum for continuous operations and up to 70 °C/158 °F for intermittent operation
Chemical resistance	Resists standard industrial hydrocarbons, acids, bases and solvents
Corrosion resistance	All metallic components stainless steel or brass sleeve pressure spring of stainless steel
UV resistance	In accordance with UL® 746C F1

Materials

Part	Material
Housing	Valox®
Contact carriers	Polyamide nylon (Fiberglass reinforced for 60 A to 125 A)
Cable clamps	Valox
Cable bushing	Chloroprene, onion-ring type
O-ring, seals and gaskets	Solid chloroprene
Pins & sleeves	Brass
Sleeve force ring	Stainless steel
Terminal screws	Zinc-plated steel
Flap/screw cover springs	Stainless steel
Mounting flanges	Valox

Approvals and compliances	
1682, 1686 E109667 E109550 E163435	
60 309-1, -2, -4 LVD 2006/95/EC EMC 2004/108/EC	
C22.2 No. 182.1 LR 051334	

Valox is a registered trademark of SABIC.

ABB IEC 60 309 international pin and sleeve

Mechanical interlocks (unfused/switched, fused and breakered)

Performance – Electrical

Application	Performance
Dielectric voltage withstand	3000 V
Maximum working voltage	480 V RMS (circuit breaker version) 600 V RMS (switch version)
Current interrupting	Certified for current interrupting at full rated current and voltage
Short-circuit current rating operations	10,000 RMS symmetrical amperes Mechanical:10,000 cycles Electrical: 6000 cycles
Hp ratings (switch version)	Complies with NEC® 430–151 ratings
Circuit breaker UL listed Interrupting rating	22,000 AIC

Performance – Mechanical

Application	Performance
Cold (-35 °C) impact resistance	In accordance with UL 746C
Wiring accommodations	Suitable for metallic conduit. Conduit entry locations at enclosure top and bottom
Terminal identification	In accordance with UL, CSA and IEC 60 309 conventions
Product identification	Identification, ratings and color code in accordance with UL, CSA and IEC 60 309 requirements
Lockout/tagout	“ON” and “OFF” lockout/tagout capability at switch handle. Complies with OSHA Reg. 29CFR 1910.147
Mounting	External adjustable feet

Performance – Environmental

Application	Performance
Moisture resistance	Screw cap version: UL Type 4X & 12K, IP67 & IP69K
Flammability	UL 94-5VA and V0 classifications
Operating temperatures	Maximum continuous: 60 °C (140 °F) Minimum continuous: -40 °C (-40 °F)
UV resistance	UV-stabilized material in accordance with UL® 746C F1
Chemicals	Resists most standard industrial hydrocarbons, acids, bases and solvents

Materials

Part	Material
Enclosure (all exterior components)	UL 94-5VA/V0, UV-stabilized, impact-modified Valox®
Contact carrier	Polyamide nylon (fiberglass reinforced for 60 A to 125 A devices)
Gaskets	Chloroprene or EPDM
Contacts (sleeves)	Brass
Hardware (screws and springs)	Steel with zinc-plated blue chromate or nickel plating

Approvals and compliances	
UL 508 and UL 98 (switch version) UL 231 and UL 489 (circuit breaker version) UL 1682, 1686	
IEC 60 309-1, -2, -4	
CSA C22.2 No. 14, 182.1	

DuraTite® and Ever-Lok® locking connections

Industrial specification grade redefined.

Non-metallic self-locking plugs, connectors and receptacles

From our industry-standard Ever-Lok series of plugs, connectors and receptacles, Russellstoll® has developed DuraTite – the first non-metallic, self-locking pin and sleeve power interconnection system. In 20- and 30 A ranges, DuraTite mates with existing 15–30 A Ever-Lok receptacles already in use.

Industrial "safety grade" construction

- 20 A and 30 A plugs and connectors (600 V AC max.)
- Indoor industrial and heavy-duty use
- Durable, tough and flame safety rated housings
- DuraV® housing material specially selected for hot or cold washdown duty
- Flame safe UL94-V0 rated housings
- Superior performance in corrosive environments
- High-visibility yellow housings

Safe and reliable power connections: pin and sleeve, voltage polarized

- Long life: Round, self-cleaning, constant-pressure pin and sleeve contacts, of solid CDA 360 brass for long reliable electrical life
- More power, operates cooler: Large circular electrical contact area allows more current flow with lower temperature rise
- Ground pin keyed for voltage polarization (O-ring seal)
- Voltage polarized for safe connection (U-ground) (pins shown with optional O-ring seals)

Easy to wire

- "No twist-off" locking plugs: Integral threaded screw collars and compression-type bushings make wiring a snap
- Fast assembly and wiring: "Drop-In" rear loaded interiors use no assembly screws, versus 3–5 or more with other connectors. 30/50 A connectors use unique E-Z Tite™ external gland lock screw
- Set-screw terminals: Are quick and easy to wire, with complete wire capture in deep pin/sleeve barrels

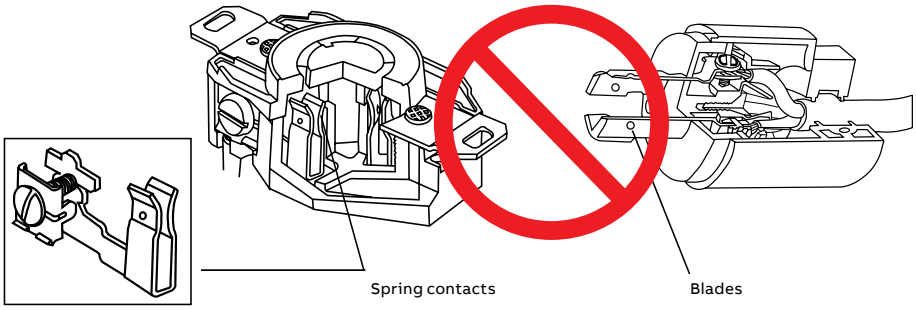
DuraTite® and Ever-Lok® locking connections

Amps at 250 V	Poles/ wires	Voltage	Face recep./ conn.	Cat. nos. Plug DuraTite	Plug Ever-Lok	Connector DuraTite	Connector Ever-Lok	Std. I.D. bushing: plug/ conn.(in.)	Receptacle – Ever-Lok	
20	2P3W	125 V AC		5P23U1LD	8013U1	5C23U1LD	8023U1	0.625	8003U1	8083U1
					8153U1		8093U1			
					8593U1		8683U1			
		250 V AC		5P23U2LD	8013U2	5C23U2LD	8023U2	0.625	8003U2	8083U2
					8153U2		8093U2			
					8593U2		8683U2			
		277 V AC		5P23U3LD	8013U3	5C23U3LD	8023U3	0.625	8003U3	8083U3
					8153U3		8093U3			
					8593U3		8683U3			
		480 V AC		5P23U4LD	8013U4	5C23U4LD	8023U4	0.625	8003U4	8083U4
					8153U4		8093U4			
					8593U4		8683U4			
		600 V AC		5P23U5LD	801345	5C23U5LD	8023U5	0.625	8003U5	8083U5
					8153U5		8093U5			
					8593U5		8683U5			
		Through 600 V AC (all)		5P23U0LD	8013	5C23U0LD	8023	0.625	8003N	8083N
					8153		8093			
					8593		8683			
30	2P3W	125 V AC		5P33U1LD	–	5C33U1LD	–	0.700	–	–
		250 V AC		5P33U2LD	–	5C33U2LD	–	0.700	–	–
		277 V AC		5P33U3LD	–	5C33U3LD	–	0.700	–	–
		480 V AC		5P33U4LD	–	5C33U4LD	–	0.700	–	–
		600 V AC		5P33U5LD	–	5C33U5LD	–	0.700	–	–
		Through 600 V AC (all)		5P33U0LD	8015	5C33U0LD	8025	0.700	8030N	8005N
					8155		8095			
					8656		8646			
20 (10, 600 V)	3P4W	125/250 V AC		5P24U1LD	–	5C24U1LD	–	0.625	–	–
		3Ø 250 V AC		5P24U2LD	–	5C24U2LD	–	0.625	–	–
		3Ø 480 V AC		5P24U4LD	–	5C24U4LD	–	0.625	–	–
		347/600 V AC		5P24U5LD	–	5C24U5LD	–	0.625	–	–
		Through 600 V AC (all)		5P24U0LD	8018	5C24U0LD	8028	0.625	8008	8084
					8158		8098			
					8594		8684			
30 (20 A, 600 V)	3P4W	125/250 V AC		5P34U1LD	–	5C34U1LD	–	0.750	–	–
		3Ø 250 V AC		5P34U2LD	–	5C34U2LD	–	0.750	–	–
		3Ø 480 V AC		5P34U4LD	–	5C34U4LD	–	0.750	–	–
		347/600 V		5P34U5LD	–	5C34U5LD	–	0.750	–	–
		Through 600 V AC (all)		5P34U0LD	8014	5C34U0LD	8024	0.750	8031	8004
					8154		8094			
					8597		8687			
					8657		8647			

Note: DuraTite plugs and connectors will mate but not lock to metal plugs and connectors referenced above.
DuraTite will lock to existing metal receptacles, from standard Ever-Lok line.

DuraTite® and Ever-Lok® locking connections

Bladed plug and receptacle
Spring-blade contact designs offer point contact only, with minimal mechanical support in receptacles. Higher heat is generated with use as contacts loosen due to age and dirt accumulation, resulting in failures. Exposed blade contacts can easily be damaged.



Performance – Electrical

Application	Performance
Dielectric voltage withstand	3000 V
Max. Working voltage	6000 V RMS (minimum creepage and minimum clearance per UL 840)
Circuit interrupting/ load breaking	UL® listed and CSA certified for circuit interrupting at full rated current
Temperature rise	Max. 30° C temperature rise at full rated current after 50 cycles of overload at 150% rated current at 0.75 pF
Horsepower	Per NEC® 430-151 ratings

Performance – Mechanical

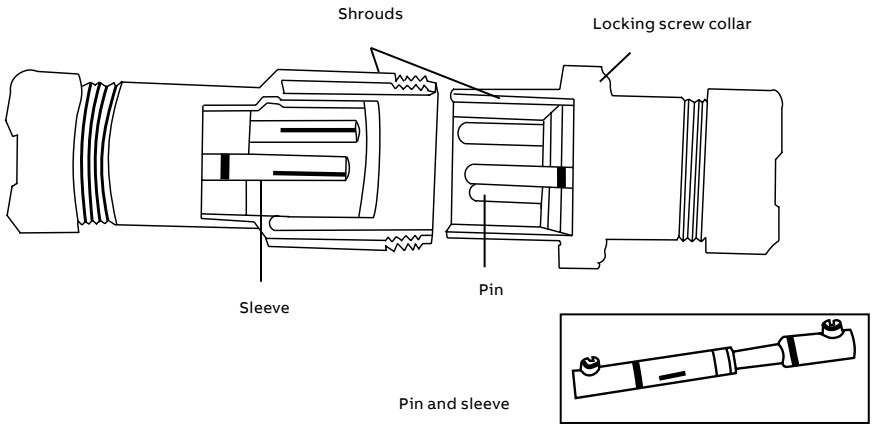
Application	Performance
Impact resistance	Per UL 1682 Paragraph 34
Cord accommodation	Round portable service cords; 10 standard diameters from 0.405" to 1.00", custom sizes to spec
Terminal identification	In accordance with UL 1682
Cable pull-out force	In accordance with UL 1682
Product identification	Identification label and molded-in name

Approvals

NEC is a registered trademark of the National Fire Protection Association, Inc.

DuraTite® and Ever-Lok® locking connections

Pin and sleeve connector and plug
Pin and sleeve design enables higher current flow at cooler temperatures due to the large circular contact area. Sleeves act as retainers for the pins, making a reliable connection. Shrouded pins and sleeves are protected from damage and casual access. Locking screw collars provide for a reliable, long-lasting connection.



Performance – Environmental

Application	Performance
Moisture resistance	Per UL 1682 paragraph 49. Flap cover on receptacle, O-rings optional on all pins, sleeves and interiors. Watertight interiors with optional O-rings. Meets requirements for NEMA 3R/12 and IP44
Flammability	V0 or better per UL 94
Operating temperatures	Maximum continuous: 95 °C/203 °F Minimum: -40 °C/-40 °F without impact
Chemicals	Resists standard industrial hydrocarbons, acids, bases and solvents

Material

Part	Material
Contact carrier interior	Molded arc-resistant UL 94-V0 phenolic thermoset
Housing, gland nuts	DuraV® UL 94-V0, high impact
Screw collar rings	Thermoplastic
O-rings	Buna-N (Nitrile)
Contacts: pins and sleeves	Brass CDA 360
Terminals	Brass CDA 360
All hardware	Stainless steel
Gland friction	20 A – Nylon
Washer	30 and 50 A – Aluminum
Cable clamp bushing	Neoprene

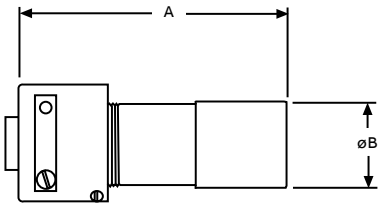
DuraTite® and Ever-Lok® locking connections

Dimensions

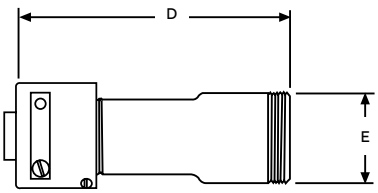
Amps		A*	ØB	C*	Ød
20	inches	3.87	1.53	4.40	1.79
	mm	98.3	38.9	111.8	45.5
30	inches	6.00	1.79	6.25	2.05
	mm	152.4	45.5	158.8	52.1

* Dimensions will vary slightly with assembly.

Plugs



Connectors



Receptacles

DuraTite mates and locks to standard Ever-Lok (see page 120).

Accessories

- Additional boxes and accessories available: Ever-Lok section

Conduit boxes (for surface mounting)

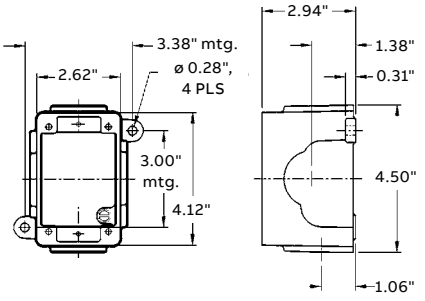
	Cast aluminum	Cast brass
Single	3711A	3731
Double	3712A	3732

Note: ¾" NPT hole standard.
Additional accessories are available. Consult your ABB representative.

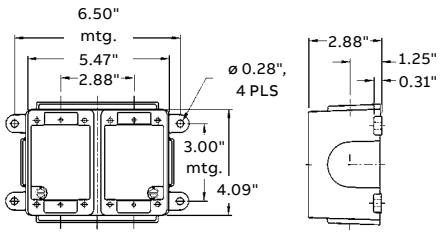
45° Angle adapter

Cast aluminum	Cast brass
3678A	3678B

Dimensions

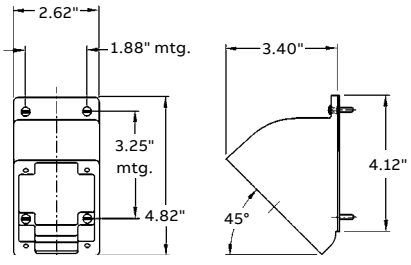


Cat. no. 3711A



Cat. no. 3712A

Dimensions



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DuraTite® and Ever-Lok® locking connections

Standard – 10–50 A, maximum 600 V AC or 250 V DC **Heavy service** – 30–100 A, maximum 480 V AC or 250 V DC **Midget** – 10–20 A, maximum 250 V AC or 250 V DC

When an Ever-Lok connection is made, it is a mechanical attachment that will not pull apart unless it is unlocked by hand. To install, line up the tabs and plug it straight in. External buttons or ribs lock with the mating internal housing automatically. When an Ever-Lok connector plugs in, it stays in. Locked housings do the work so Ever-Lok contacts can carry the load! A firm grip and a counter-clockwise reverse twist-release locking for easy removal.

DuraTite® and Ever-Lok® locking connections

Design features

Automatic locking – Automatic locking feature mechanically attaches the plug casing to the receptacle or connector and eliminates strain on electrical contacts.

Positive grounding – Casings are positively grounded by means of phosphor-bronze ground straps integral with ground contacts. Equipment grounding is secured by separate set of contacts which “make first” and “break last” as required by UL.

Dust-proof – On clamp-type plugs and connectors, a washer is provided in each cap to be forced over the cord. This serves as a shield to prevent metal particles, dust, etc., from entering the interiors of plugs and connectors.

Bushing-type plugs and connectors are furnished with a gland nut and Neoprene cable bushing gland to exclude dust and moisture. A formed glide washer is also provided to facilitate tightening of the gland nut.

Receptacle covers are sealed to boxes by gaskets and have hinged flaps which are gasket-lined and equipped with strong springs to keep them closed and dust out.

Steel-clad – Plugs and connectors are plated steel. Plugs have encased locking spring in machine-assembled non-separable housings.

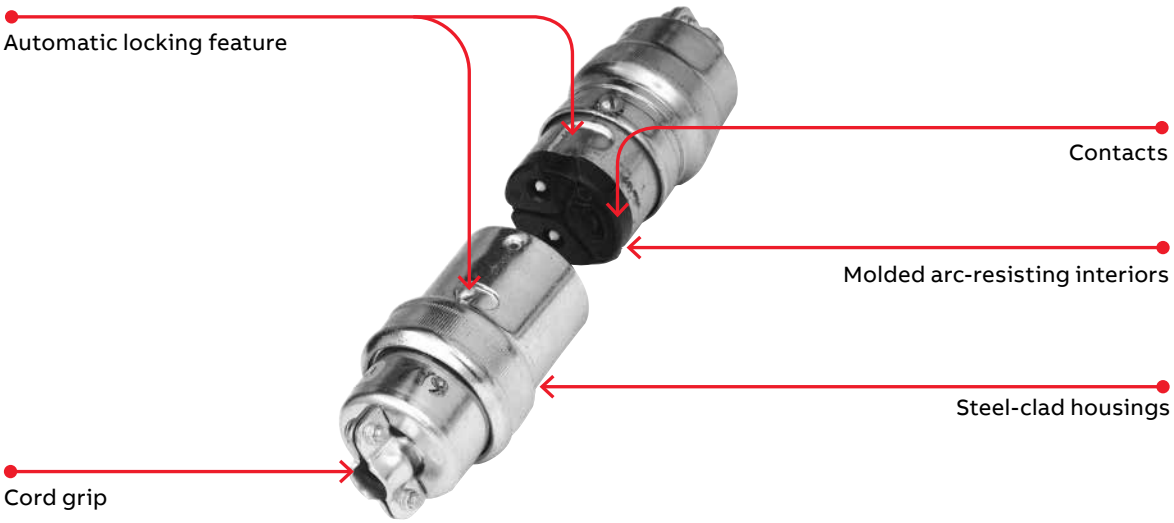
Cord grip – Plugs and connectors are provided with adjustable cord grips, preventing strains on connections.

Contacts – Contacts are precision-made, self-wiping and self-aligning brass and nickel-plated brass.

Unit assembly – Contacts and terminals are permanently assembled in an arc-resisting composition body, permitting removal of interior as a unit for wiring. All connections are entirely enclosed, thus avoiding accidental short circuits and tampering by inexperienced personnel.

Handles lined – Shell handles have an HDPE liner to contain stray wire ends.

Interiors – All interiors are molded arc-resisting composition.



DuraTite® and Ever-Lok® locking connections

Male plugs and female connectors



Male plugs and female connectors

Poles/ wires	Amps at 250 V AC	Rating	Male plug clamp type	Max. cable dia. (in.)	Male plug bushing type	Cable bushing hole dia. (in.)	Male plug hub type*	Conduit size (in.)
2P3W	15	20 A, 125 V AC	8013	½	8153	⅝	8593 8593CTN**	½ ½
		15 A, 250 V AC						
		10 A, 600 V AC						
		20 A, 125 V AC	8013U1	½	8153U1	⅝	8593U1 8593U1CT*	½ ½
		15 A, 250 V AC	8013U2	½	8153U2	⅝	8593U2	½
		15 A, 277 V AC	8013U3	½	8153U3	⅝	8593U3	½
		15 A, 480 V AC	8013U4	½	8153U4	⅝	Consult ABB Representative	
		15 A, 600 V AC	8013U5	½	8153U5	⅝	Consult ABB Representative	
	30	30 A, 250 V AC	8015	⅝	8155	⅝	8656	¾
		20 A, 600 V AC						
3P4W	15	20 A, 125 V AC	8018	½	8158	11⁄16	8594	½
		10 A, 250 V AC						
		15 A, 250 V AC						
		10 A, 600 V AC						
	30	20 A, 600 V AC	8014	⅝	8154	¾	8597 8657	½ ¾
		30 A, 250 V AC						
	50	50 A, 250 V AC	8314-S 8314	¾ 1⅛	8354	1	8396 8397	½ ¾
		30 A, 250 V AC						
		30 A, 600 V AC						

* Hub with clamp added at size.
** Accommodates rigid conduit or standard connectors for armored and non-metallic cable or flexible conduit.
Notes: (for plugs and connectors):
Cable bushing – Oil-resistant neoprene cable bushing regularly furnished with hole size as listed. Other hole sizes available at no extra cost, when specified on order. See page 131 for available sizes. Bushing-type plugs and connectors can be furnished with adapters to accommodate rigid conduit or standard connectors for armored and non-metallic cable or flexible conduit. See page 130.
"N" in catalog number refers to nickel-plated neutral pin replace.
Ex: 8013 with 8013N.
Special construction options for Ever-Lok plugs include control "dummy plugs" for press lockout function. Consult technical services.

Female connector Clamp type	Max. cable rating (in.)	Female connector bushing type	Cable bushing hole dia. (in.)	Female connector hub type**	Conduit size (in.)
8023	½	8093	⅝	8683N/8683CTN*	½
8023U1	½	8093U1	⅝	8683U1/8683U1CT*	½
8023U2	½	8093U2	⅝	8683U2	½
8023U3	½	8093U3	⅝	8683U3	½
Consult ABB Representative		Consult ABB Representative		Consult ABB Representative	
Consult ABB Representative		Consult ABB Representative		Consult ABB Representative	
8025	⅝	8095	⅝	8646	¾
8028	½	8098	11⁄16	8684	½
8024	⅝	8094	¾	8687/8687CT* 8647	½ ¾
8324S	¾	8394	1	8386 8387	½ ¾

* Hub with clamp added at size.

** Accommodates rigid conduit or standard connectors for armored and non-metallic cable or flexible conduit.

DuraTite® and Ever-Lok® locking connections

Standard service female receptacles and reverse service male receptacles

Specifications

- Receptacle housing: plated steel; receptacle with cover only; furnished with 6–52 mounting screws; for mounting on switch box or outlet box, use adapter plate 8091A; see page 130
- Back boxes: cast aluminum, epoxy powder-coat finish; flap and screw caps aluminum, corrosion-resistant copper-free alloy or steel, CAD plated
- Plug: all cable entry styles of plugs with equivalent ratings fit above receptacles
- Conduit boxes: Type FSWS-62 or FDWS-62 standard, cast aluminum; additional boxes available; see pages 127–128
- Gang type: can be furnished in gang or tandem units and in combination with other FS and FD devices; see pages 127–128
- Outlets: unless otherwise specified, furnished with one ¾" outlet; additional outlets charged extra, specific size and location; consult technical services

Standard service female receptacles and reverse service male receptacles

Poles/ wires	Amps at 250 V AC	Rating	Female receptacle only with flap cover^	Female receptacle with box FSWS-62*
2P3W	15	20 A, 125 V AC	8003	8083
		15 A, 250 V AC		
		10 A, 600 V AC		
		20 A, 125 V AC	8003U1	8083U1
		15 A, 250 V AC	8003U2	8083U2
		15 A, 277 V AC	8003U3	8083U3
		15 A, 480 V AC	8003U4	8083U4
		15 A, 600 V AC	8003U5	8083U5
	30	30 A, 250 V AC	8005	8030
		20 A, 600 V AC		
3P4W	15	20 A, 125 V AC	–	–
		10 A, 250 V AC	8008	8084
		15 A, 250 V AC	–	–
		10 A, 600 V AC	–	–
	30	20 A, 600 V AC	–	With FS Box
		30 A, 250 V AC	8004	8031
	50	50 A, 250 V AC	–	With FD Box
		30 A, 250 V AC	8304	8331
		30 A, 600 V AC	–	–

Notes:
^ For FS, FD, FSWS, FDWS and similar conduit fittings.
* Receptacle with box and cover.
** Provided with FDWS62 Box.
‡ Two-gang receptacles can also be provided in mixed configurations including NEMA bladed, etc. Consult technical services.
Male inlets (reversed contacts service): Use receptacle mountings but accept standard female connector.
Horsepower ratings:
1/2 hp, 1-phase, 230 V AC
1 hp, 3-phase, 115 V AC
Note: Standard Ever-Lok receptacles also accept DuraTite® plugs.

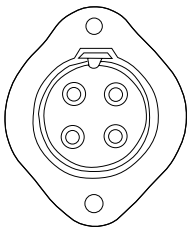
	2-Gang‡	Male receptacle	Male receptacle with box**
	8128	8143	8143D
	8128U1	8143U1	8143U1D
	8128U2	8143U2	8143U2D
	8128U3	8143U3	8143U3D
	8128U4	Consult your ABB representative	Consult your ABB representative
	8128U5	Consult your ABB representative	Consult your ABB representative
	8131	8146	Consult your ABB representative
	–	–	–
	8129	–	–
	–	8144	8144D
	–	–	–
	With FD Box	–	–
	8132	8147	8147D
	With FD Box	–	–
	8334	8374	8374
	–	–	–

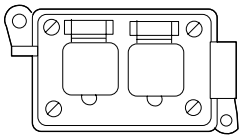
DuraTite® and Ever-Lok® locking connections

Standard service female receptacles, male plugs and female connectors, reverse service female plugs and male connectors

Specifications

- Receptacle housing: heavy gauge steel, plated
- Back boxes: Type FSWS-62 standard, cast aluminum; additional boxes available, see pages 127–128
- Gang type: can be furnished in gang or tandem units and in combination with other FS and FD devices; see pages 127–128
- Outlets: standard, one ¾" top or bottom; additional outlets charged extra; see boxes listed on pages 127–128
- Plug and connector housings: steel, plated
- Cable diameter:
  Clamp type: 0.500" max. cable diameter
- Bushing type:
  2P3W – 0.563" diameter standard
  3P4W – 0.281" diameter standard
  4P5W – 0.594" diameter standard
- Cable bushing: Oil-resistant neoprene cable bushing regularly furnished with hole size as listed. Other hole sizes available at no extra cost when specified on order; see page 131 for available sizes

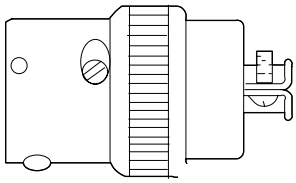


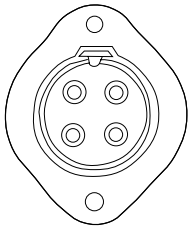


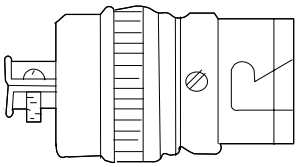
Standard service female receptacles, male plugs and female connectors, reverse service female plugs and male connectors

Poles/wires	Rating	Single receptacle: Receptacle only	Single receptacle: with back box	Flanged panel mount receptacle	Duplex receptacle: Receptacles only	Duplex receptacle: with back box
2P3W	10 A, 250 V DC 20 A, 250 V AC*	8703	8753	8943	8733	8773
	20 A, 125 V AC	8703U1	8753U1	8943U1	8733U1	8773U1
	15 A, 250 V AC	8703U2	8753U2	8943U1	8733U2	8773U2
3P4W	10 A, 125 V DC	8704	8754	8944	8734	8774
	20 A, 250 V AC**					
4P5W	10 A, 125 V DC 20 A, 250 V AC**	8705	8755	8945	8735	8775

Notes:
* ½ hp, 1-phase, 230 V AC
**1 hp, 3-phase, 115 V AC







Clamp type^			Clamp type^	
Male plug	Female connector	Male flanged panel mount	Female plug	Male connector
8713	8723	8943R	8713R	8723R
8713U1	8723U1	8943U1R	8713U1R	8723U1R
8713U2	8723U2	8943U2R	8713U2R	8723U2R
8714	8724	8944R	8714R	8724R
8715	8725	8945R	8715R	8725R

^ Plugs and connectors are also available as bushing or hub type similar to those in standard Ever-Lok.
Please consult your ABB representative.

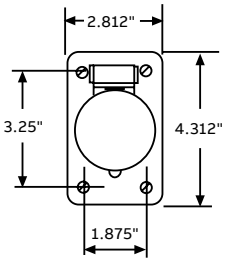
DuraTite® and Ever-Lok® locking connections

Dimensions

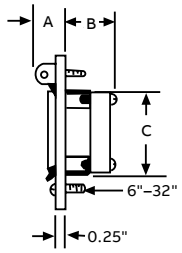
Female receptacles and reverse service

	Standard service				Reverse service			
Size	**A (in.)**	**B (in.)**	**C (in.)**	**D (in.)**	**A (in.)**	**B (in.)**	**C (in.)**	**D (in.)**
Standard								
10 A 15 A 20 A	0.875	1.375	2.375	2.313	0.875	2.000	1.750	2.937
30 A	0.875	1.500	2.875	2.937	0.875	1.500	2.875	2.937
50 A	1.470	1.875	2.125	2.937	1.470	1.875	2.125	2.937
Midget	0.687	1.810	1.280	NA	0.687	1.810	1.280	NA

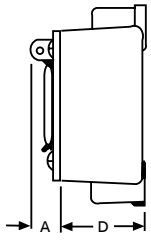
Dimensions



Without box

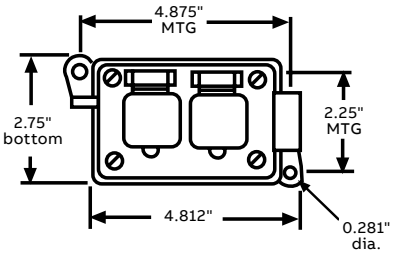


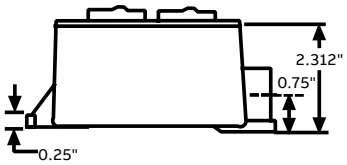
With box FSWS-62



Without box FDWS-62

Midget duplex

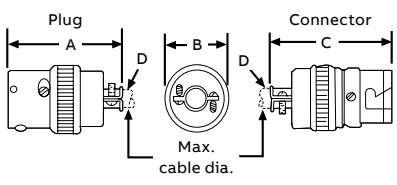




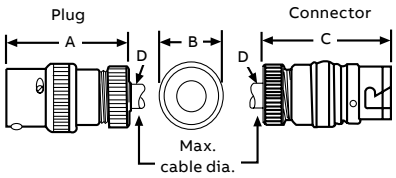
Plugs and connectors

	Clamp type				Bushing type				Hub type			
Size	**A (in.)**	**B (in.)**	**C (in.)**	**D (in.)**	**A (in.)**	**B (in.)**	**C (in.)**	**D (in.)**	**A (in.)**	**B (in.)**	**C (in.)**	**D (in.)**
Standard												
15–20 A	3.125	1.750	3.187	0.500	3.250	1.750	3.375	0.750	3.125	1.750	3.187	0.500
30 A	3.437	2.125	4.250	0.625	3.750	2.125	4.500	1.125	3.500	2.125	4.250	0.750
50 A	4.750	2.125	4.750	1.125	4.875	2.125	4.875	1.125	4.500	2.125	4.625	0.750
Midget	2.875	1.440	2.875	0.500	3.000	1.440	3.000	0.625	2.875	1.440	2.875	0.500

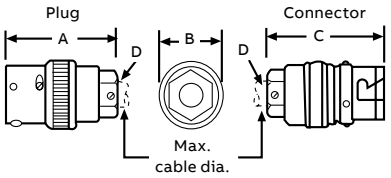
Dimensions



Clamp type



Bushing type



Hub type

DuraTite® and Ever-Lok® locking connections

Mounting options for midget and standard Ever-Lok.

Single-gang

Two-gang

DSFD

Type FS (shallow) and Type FD (deep)
Aluminum boxes have 6-32 cover mounting holes tapped to accommodate all FS and FD cover assemblies. Brass boxes have 10-24 cover mounting holes tapped to accommodate all FS and FD cover assemblies.

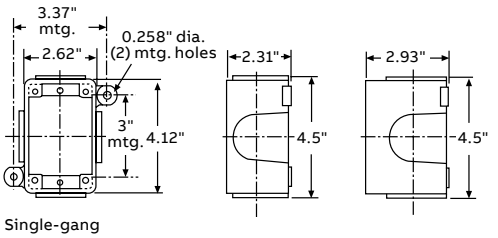
Type FS (shallow) and Type FD (deep)

Type	Cast aluminum	Cast brass	Overall dimensions* (in.)	Gangs
FS	3701A	3721-RS	4.12 x 2.62 x 2.31	Single
FD	3711A	3731-RS	4.12 x 2.62 x 2.94	
DSFD	3781A	–	4.12 x 3.62 x 4.12	
FS	3702A	3722-RS	4.12 x 5.5 x 2.25	Two
FD	3712A	3732-RS	4.12 x 5.62 x 2.87	

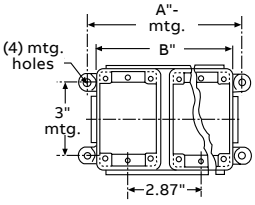
* Dimensions are overall exclusive of conduit pads and mounting lugs.

Notes:
When Type FD devices are to be mounted in boxes, Type FD boxes should be used. FS boxes will not accommodate FD devices.
Mounting – All the above boxes are for surface mounting. For flush mounting, see page 129.
Boxes – Cast brass, natural finish; cast aluminum, corrosion-resistant copper-free alloy, epoxy powder coat finish.
Conduit Entries – Unless otherwise specified, furnished with one 0.75" outlet per gang, top or bottom. Additional conduit entries available – see price list. Specify size and location.
Maximum Conduit – FS and FD: 1", one per gang top and bottom and one each side.
DSFD – One 1.5" or two 0.5" top and bottom. Cast iron available on special order – consult your ABB representative.

Dimensions



Single-gang



Multiple-gang

DuraTite® and Ever-Lok® locking connections

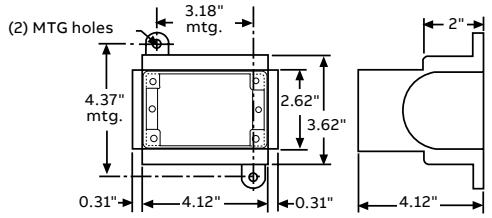
Mounting options for midget and standard Ever-Lok.

Multiple-gang dimensions

	A		B	
Gangs	**FS (in.)**	**FD (in.)**	**FS (in.)**	**FD (in.)**
2-gang	6.50	6.50	5.50	5.62
3-gang	11.25	9.37	10.37	8.50
4-gang	14.12	12.25	13.25	11.37

Dimensions

DSFD



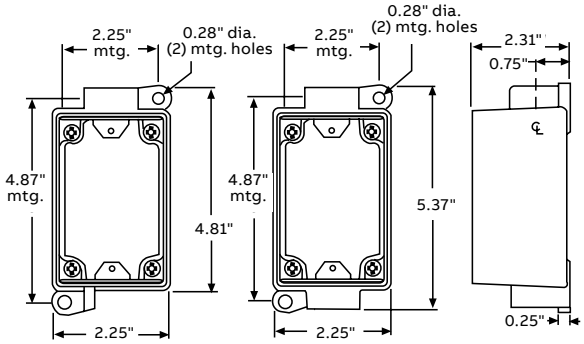
Type FSWS and FDWS
(with mounting shelf for box-mounted devices)
Aluminum die-cast boxes with cover mounting holes tapped for 6-32 screws to accommodate all FS and FD cover assemblies.

Type FSWS and FDWS

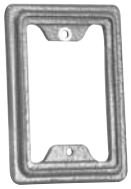
	Conduit entries	
Cat. no.	**Top (in.)**	**Bottom**
FSWS-62	¾	–
FDWS-62	¾	–
FDWS-622	¾	¾
FDWS-63	1	–
FDWS-633	1	1

Notes:
Boxes – Aluminum die-cast, corrosion-resistant copper-free alloy, epoxy powder coat finish.
Conduit entries – Standard as listed.
Mounting – All of the above boxes are for surface mounting.

Dimensions



DuraTite® and Ever-Lok® locking connections



Adapter flush frames*

Gangs	Cast aluminum	Cast brass	Overall dimensions (in.)
1	3671A	3681	5 x 3.5
2	3672A	3682	5 x 6.5

* Furnished complete with gasket and screws.
Material – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish. Cast brass, natural finish.

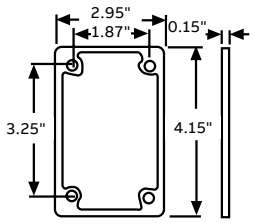
- Covers standard FS/FD™ box openings.

Blank cover*

Cat. no.	Material
3677A	Cast aluminum
3687	Cast brass

* Furnished complete with gasket and screws.
Material – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish. Cast brass, natural finish.

Dimensions

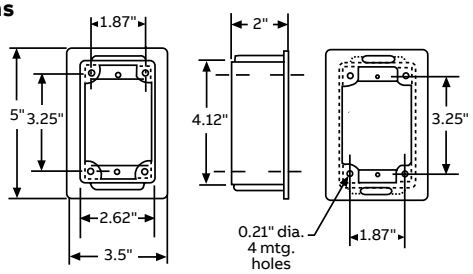


Flush wall-mounting extension*

Cat. no.	Material
3679A	Cast aluminum
3679B	Cast brass

* Furnished complete with gasket and screws.
Material – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish. Cast brass, natural finish.

Dimensions



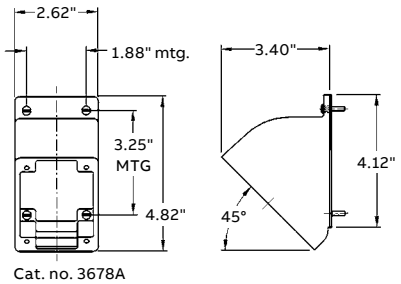
- Mounts to any FS/FD™ box.

45° Angle adapter*

Cat. no.	Material
3678A	Cast aluminum
3678B	Cast brass

* Furnished complete with gasket and screws.
Material – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish. Cast brass, natural finish.

Dimensions



Cat. no. 3678A

DuraTite® and Ever-Lok® locking connections

- The addition of this adapter sub-plate will permit the use of Ever-Lok conduit box-type receptacles in switch boxes or outlet boxes with raised covers, as listed. Used on standard (deep) stamped metal conduit boxes. Adapts two-hole to four-hole patterns.

Adapter sub-plate

Cat. no.	Material
8091A	Cast aluminum

- Provides extra clamping protection in hard service applications. Relieves terminals and rubber gland of all cable strain.

Combination gland nut and cable clamp

Plug or connector size	Cast aluminum Cat. no.	Cast brass Cat. no.	Max. cable dia. (in.)
10 A	3905	3905B	0.62
20 A	3906	3906B	1.12
30 A	–	–	–

Material – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish, cast brass.

- Adapter tapped with NPT thread to accommodate armored and non-metallic cable or flexible conduit.

Conduit adapters

Plug or connector size	Cast aluminum Cat. no.	Cast brass Cat. no.	Tapped hole NPT (in.)
15 A	FSA11	FSA11B	0.5
	FSA12	FSA12B	0.75
30 A	FSA21	FSA21B	0.5
50 A	FSA22	FSA22B	0.75
	FSA23	FSA23B	1

DuraTite® and Ever-Lok® locking connections

Size 2
Cable bushing

Size 3
Cable bushing

Cable bushings

Hole diameter for cable (in.)	Size 1 Midget Ever-Lok	Size 2 Std. 15 A	Size 3 20, 30 and 50 A
0.250	MG0	–	–
0.313	–	SG05	–
0.375	–	SG1	JG31
0.438	MG15	SG15	–
0.500	MG2	SG2	JG32
0.531	–	SG2A	–
0.563	MG25	SG25	JG325
0.594	MG2B	SB2B	–
0.625	–	SG3	JG33
0.688	–	SG3A	–
0.750	–	SG4	JG34
0.875	–	–	JG35
1.000	–	–	JG36*
1.125	–	–	JG361**

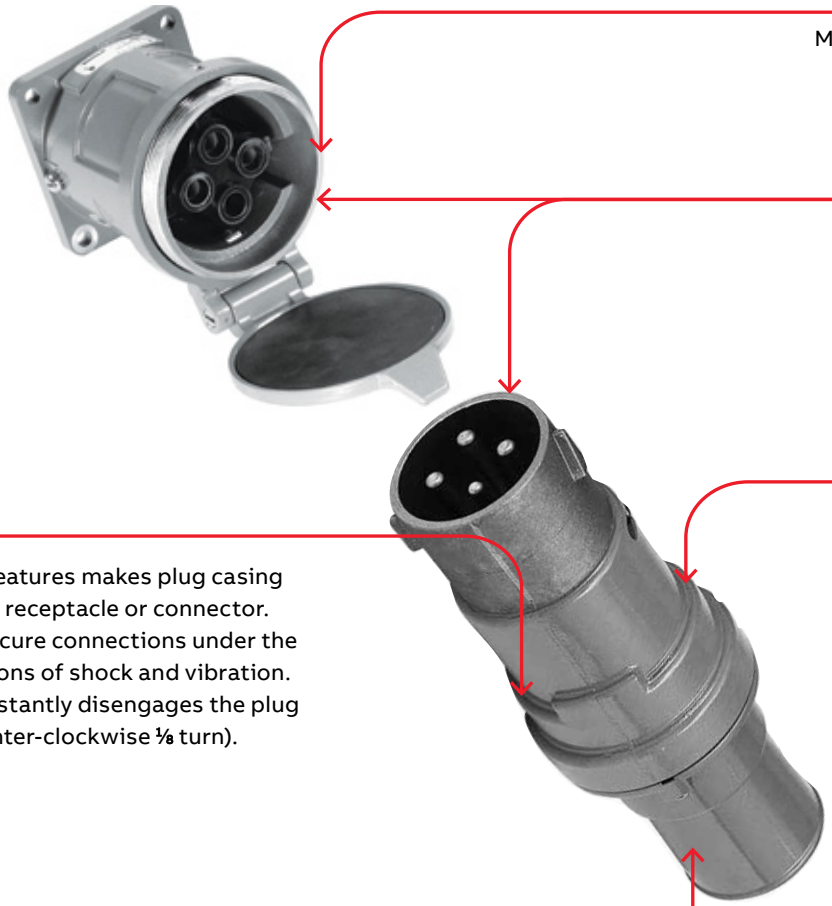
Material – Oil-resistant Neoprene.
Size 3 cable bushing:
* Style for maximum cable only.
** Special minimum wall style.
Notes: Bushing specials available at time of order.
When standard plugs or connectors are required to be furnished with one or more of the above accessories, add the suffix and catalog number of the accessory selected to the catalog number of the plug or connector.
Complete list price is the total of the list price of the device plus the list price of the accessory.
Example – Catalog no. SKP3G with adapter tapped 3/8" would be catalog no. SKP3G/JG31.

DuraTite® and Ever-Lok® locking connections

Heavy-duty automatic locking receptacles, plugs and connectors

30–100 A, 480 V AC/250 V DC
Heavy service Ever-Lok components stay plugged in so your portable equipment stays on. The industrial standard for portable welders and other industrial equipment locks in place automatically at insertion – no screw collars to bother with. With its contoured handle, an easy counter-clockwise twist releases the plug for withdrawal, even under full-rated load/circuit-interrupting conditions.
Simple and rugged, the heavy service Ever-Lok self-locking system sets the standard for easy access in facilities, welding and industrial equipment use. All standard receptacle configurations are available, as well as reversed contact service options.

Design features



Molded arc-resisting composition interiors with machined, full-floating, self-aligning contacts.

Safety-polarized interiors that can only be assembled in the correct position.

Durable cast aluminum, corrosion-resistant, copper-free alloy, epoxy powder-coated finish housings.

Automatic locking features makes plug casing mechanically fast to receptacle or connector. Provides positive secure connections under the most severe conditions of shock and vibration. Twist of the wrist instantly disengages the plug when required (counter-clockwise ⅛ turn).

Easy 60 A ¼-turn handle removal simplifies and speeds up wiring (combination conduit adapter thread/clamp assembly included).

DuraTite® and Ever-Lok® locking connections




Amps	Poles/ wires	Plug	Receptacle	HSF series basic receptacle	HSA series* receptacle
30	2P3W	8407	8443	HSF8403	8403
	3P4W	8408	8444	HSF8404	8404
60	2P3W	8417	8453	HSF8413	8413
	3P4W	8418†	8454	HSF8414	8414
100	3P4W	8428-72	8464-72	HSF8424-72	8424-72

Notes:
Reverse service available by adding "R" suffix to catalog number.
Solder lugs on 100 amp only.
Connectors — Can be furnished with conduit adapters to accommodate rigid conduit or standard connectors for armored and non-metallic cable or flexible conduit. See page 130.

Flap covers are standard on all receptacles.
* Can be furnished with 45° angle adapter when specified on order. Add suffix -45 to catalog number.
† 8418 or F27194 automotive 480 VAC version plug.

Standard cable bushing

Current rating (A)	Bushing (in.)	Max. AWG size
30	7/8	#8, 7-strand or flexible
60	1 3/16	#4, 7-strand or flexible
100	1 1/2	#2, 7-strand or flexible

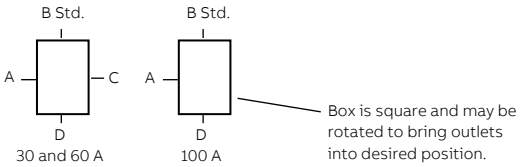
See page 131 for other bushings.

Conduit size

Current rating (A)	Std. size (in.)	Max. size (in.)
30	1	1 1/4
60	1	1
100	2	2

See page 130 for cable conduit adapters.

Outlet location – Standard series



DuraTite® and Ever-Lok® locking connections

Receptacle mounting options

Progressive assembly

Mounting style		To order use:	Current rating 30 A	60 A	100 A
Standard series HSA 		Receptacle + Vertical or square mount box + Angle adapter or JAA3-45 (45°)	Basic receptacle* + JB3-B100 1" Std. conduit size + JAA3 (20°) or JAA6-45 (45°)	Basic receptacle* + JB6-B150 1½" Std. conduit size + JAA6-AB6 (20°) or JAA10-45 (45°)	Basic receptacle* + JB10-B200 2" Std. conduit size + JAA10 (20°)
Series HSR straight 		Receptacle + Vertical mount box + Straight adapter	Basic receptacle* + JB3-B100 1" Std. conduit size + JRA3	Basic receptacle* + JB6-B150 1½" Std. conduit size + JRA6-AB6	Basic receptacle* + JB10-B200 2" Std. conduit size + JRA10
Series HSB 		Receptacle + 30° Angle adapter	Basic receptacle* + JAAB3	Basic receptacle* + JAAB6	Basic receptacle* + JAAB10
Series HSE 		Receptacle + Angle enclosure 1" Std. conduit size	Basic receptacle* + JE3 1½" Std. conduit size	Basic receptacle* + JE6	–
Series HSH horizontal 		Receptacle + Horizontal mount box + Angle adapter	Basic receptacle* + JB3-B100 1" Std. conduit size + JHA3 (20°)	–	–

* Select appropriate receptacle by rating, configuration and voltage on page 133.
Ordering – Order individual pairs or use series letters followed by receptacle I.D. (ref. HSA series number).
Example: HSB8414. (For HSA, use receptacle catalog numbers only.)

DuraTite® and Ever-Lok® locking connections

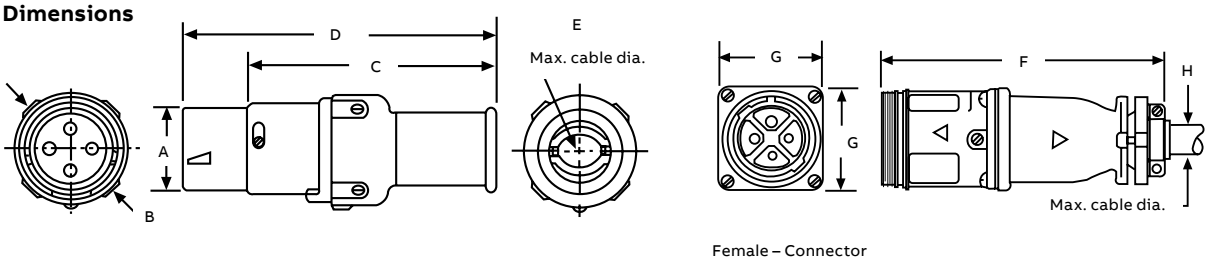
Dimensions

Dimensions for 2-, 3- or 4-wire weathertight plugs and connectors

Amp	A (in.)	B (in.)	C* (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H (in.)
30	2	3	5.625	7	1	7.625	2.750	1.125
60	2.625	3.750	7.687	9.750	1.50	9.625	3.500	1.500
100	2.625	3.750	7.687	11	1.50	10.875	4	1.875

* Length of plug exposed when engaged in receptacle or connector.

Dimensions

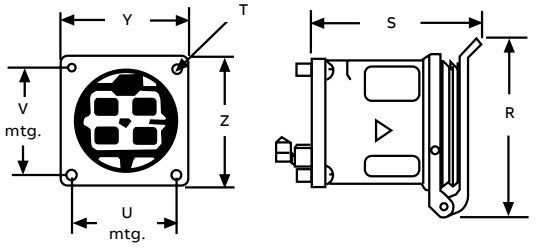


Female – Connector

Dimensions for 3- or 4-wire basic receptacles

Amp	Y (in.)	V (in.)	U (in.)	T (in.)	S (in.)	R (in.)	Panel opening (in.)
30	2.750	2.250	2.250	0.213	3.250	7.000	2.250 D
60	3.500	2.875	2.875	0.281	4.625	8.875	2.875 D
100	4	3.375	3.375	0.281	5.875	10.500	3

Dimensions



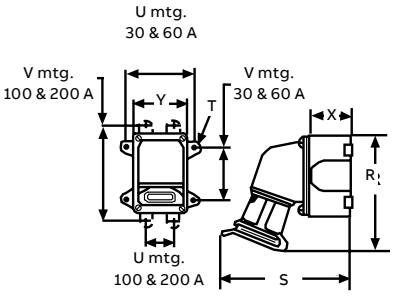
DuraTite® and Ever-Lok® locking connections

Dimensions

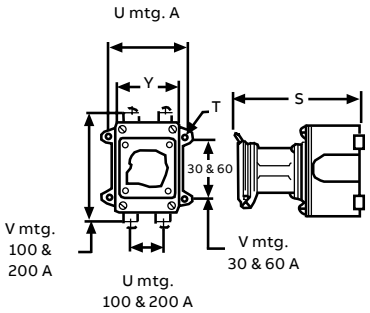
Amp	Series	Z (in.)	Y (in.)	X (in.)	V (in.)	U (in.)	T (in.)	Q (in.)	P (in.)	S (in.)	R (in.)	Panel opening (in.)
30	HSA (20°)	4.500	3.000	2.375	2.687	3.687	0.250	–	–	7.375	7.000	–
	HSA (45°)	4.500	3.000	2.375	2.687	3.687	0.250	–	–	7.875	6.625	–
	HSR	4.500	3.000	2.375	2.687	3.687	0.250	–	–	6.750	–	–
	HSB	3.125	3.125	–	2.250	2.250	0.213	–	–	6.250	–	2.250
	HSE	–	3.500	–	–	4.000	0.250	1.250	2.375	5.250	7.250	–
	HSH	3.937	4.500	2.375	3.687	2.687	0.250	–	–	7.250	6.125	–
60	HSA (20°)	5.625	4.000	3.000	3.812	4.937	0.343	–	–	9.250	8.875	–
	HSA (45°)	5.625	4.000	3.000	3.812	4.937	0.343	–	–	9.875	8.250	–
	HSR	5.625	4.000	3.000	3.812	4.937	0.343	–	–	8.375	–	–
	HSB	3.187	3.625	–	2.187	2.625	0.281	–	–	9.250	–	2.500
	HSE	–	4.250	–	3.125	4.500	0.281	1.562	3.687	6.750	9.750	–
100	HSA (20°)	5.500	5.500	3.750	6.750	4.250	0.343	–	–	10.750	10.500	–
	HSA (45°)	5.500	5.500	3.750	6.750	4.250	0.343	–	–	11.750	9.500	–
	HSR	5.500	5.500	3.750	6.750	4.250	0.373	–	–	12.250	–	–
	HSB	3.187	3.625	–	2.187	2.625	0.281	–	–	9.250	–	2.500

Note: U = horizontal mounting hole centers; V = vertical mounting hole centers.

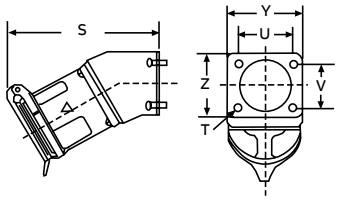
Dimensions



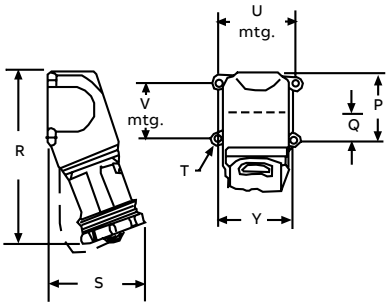
Standard series HSA



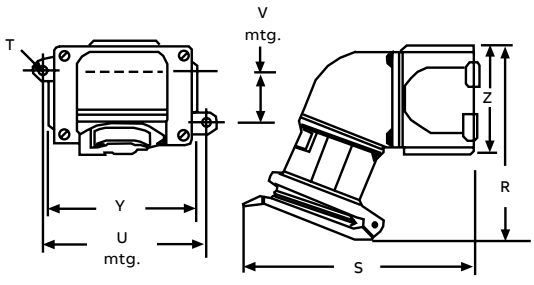
Series HSR



Series HSB



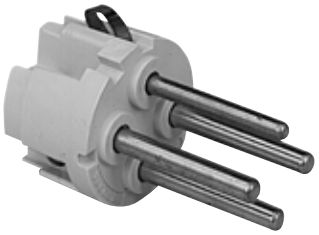
Series HSE



Series HSH

DuraTite® and Ever-Lok® locking connections

Replacement interiors



For receptacles, connectors, plugs and male inlets

	Female interiors: receptacles and connectors			Male interiors: plugs		
Poles/wires	**30 A**	**60 A**	**100 A**	**30 A**	**60 A**	**100 A**
2P3W	ARU323	ARU623	–	APU323	APU623	–
3P4W	ARU334	ARU634	ARU134-6	APU334	APU634	APU134-6

Notes:
Interiors – Arc-resisting composition with machined, full-floating, self-aligning contacts.
Solder lug interior will not interchange with mechanical lug. If you have solder lugs, reorder solder lugs.

JPA62 Conduit adapter

Conduit adapters
Adapters are tapped NPT standard pipe thread to accommodate rigid conduit or standard connectors for armored and non-metallic cable or flexible conduit.

Plug or connector sizes

30 A Cat. no.	Tapped hole size NPT (in.)	60 A Cat. no.	Tapped hole size NPT (in.)	100 A Cat. no.	Tapped hole size NPT (in.)
JPA31	½	JPA62	¾	JPA104	1¼
JPA32	¾	JPA63	1	JPA105	1½
JPA33	1	JPA64	1¼	JPA106	2

Notes:
Material – Cast aluminum, corrosion-resistant copper-free alloy, electrostatic epoxy coated. Furnished complete with gasket and screws.
To specify standard plugs or connectors equipped with one of the above adapters,
add the catalog number of the adapter selected to the catalog number of the plug or connector. Complete list price is the list price of the device plus list price of the adapter.
Example: Cat. no. 8443 with adapter tapped 1" would be Cat. no. 8443/JPA33.

DuraTite® and Ever-Lok® locking connections

Cable bushings

Boxed catalog numbers are standard bushing sizes.
To order non-standard bushing, specify as follows:
Example 8418/JG65.

Standard cable bushings
Size no. 3, 6, 10 and 20

Oversize cable bushings
Size no. 3, 6, 10 and 20

Cable bushings

Hole diameter for cable (in.)	30 A	60 A	100 A
0.375	JG31	–	–
0.500	JG32	–	–
0.563	JG325	–	–
0.594	JG32B	–	–
0.625	JG33	JG63	–
0.750	JG34	JG64	JG104
0.781	JG341	–	–
0.875	JG35	JG65	JG105
0.937	JG355	–	–
1.000	JG38*	JG66	JG106
1.125	JG361*	–	–
1.188	–	JG67	JG107
1.313	–	–	JG108
1.375	–	JG69*	–
1.500	–	JG610*	JG1010
1.687	–	–	JG1011
1.813	–	–	–
1.875	–	–	JG1013*

* Oversize cable bushings.
Note: When ordering, select bushing size slightly larger than your cable O.D. for best fit.
Material – Neoprene.
Identification letter inside hole.

Control circuit connections

Russellstoll® line selections for indoor and outdoor applications

SK/SKW Multi-pin control circuit to 11P12W 20 A
The toughest multi-circuit, screw-termination circular connector system; use self-locking SK components indoor and collar-locking SKW components outdoor; load breaking at 20 amps. Solid brass (silver-plated) contacts ensure long life and interiors can be rebuilt. All pin counts are available from 3P4W through 11P12W, gasketed interiors in SKW.

Switches 125/250 V AC 10 A, 20 A and 30 A
SPST and SPDT tumbler switches are offered in industrial and hazardous-duty styles. Heavy-duty, copper-free aluminum housings (brass available) around selected common ratings. Switches carry AC-only ratings (see Hazardous Duty section for explosion-proof switches).

Interlocks through 4P5W 30 A through 400 A
A broad offering of performance interlocks in sheet steel, cast aluminum or brass. Automotive/Industrial welding units include 60 A and 100 A versions, both heavy service Ever-Lok® and Max-Gard® lines. Switched, fused and circuit breaker versions are available as well as switchgear selections. Custom enclosures wall-mount or column-mount in standard 8" I-beam webs.

Usage

- Any application where electrical connections need protection from water and/or dust entering the contacts or the wiring compartment
- Cable or conduit sealing and device locking designs are critical
- Metal connectors are usually preferred for long service life

Typical application groups

General industrial marine
- Lighting systems
- Shore-to-ship power
- Welding stations
- Portable distribution centers
- Shipboard power outlets
- Telephone shore-to-ship

Construction and agriculture
- Generator sets and systems
- Portable tools and equipment
- Irrigation system panels portable lighting and equipment

Government, municipal and utilities
- Portable building power
- Army Corps of Engineers
- Utilities panels
- Emergency power systems
- Sewage pumping stations
- Lighting and controls

Industrial and OEM
- Factory power outlets
- HVACR controls
- Machine tool controls
- Amusement park systems

Control circuit connections

Features and benefits

20 A, 250 V AC or DC, 600 V AC maximum rating load-breaking multi-circuit receptacles, plugs, connectors and inlets

Type SK

Type SK multi-circuit receptacles, plugs, inlets and connectors are designed for indoor or NEMA 1 automatic press, tool control and welder applications requiring rugged, shock-resistant devices capable of safely interrupting rated currents under load.

Receptacles and connectors have neoprene gasket mounts and positive grounding path through separate contact. Equipment grounding contacts “make first” and “break last.” Wiring space is generous. Listed ratings are for interrupting currents under load.

The time-tested Ever-Lok® automatic locking feature provides positive connections under the most severe conditions of shock and vibration. Yet a twist of the wrist instantly disengages the plug when required.

20 A, 250 V AC or DC, 600 V AC maximum rating load-breaking multi-circuit receptacles, plugs, connectors and inlets

Type SKW

Type SKW multi-circuit receptacles, plugs, inlets and connectors are designed for outdoor NEMA 4, rough service and critical environment machinery, HVACR systems, servo control and other automatic/controlled functions requiring rugged, shock-resistant devices capable of safely breaking rated loads. These watertight and oil-tight devices are equipment grounded with ground contacts that “make first” and “break last.” Wiring space is generous. Listed ratings are for full load interrupting currents.

Both series feature simple set-screw wiring termination in a circular connector with up to 11-pole 12-wire circuit capability. A wide selection of cable bushings can be specified upon ordering at no additional charge. Conduit adapters are also available for shielded or construction usage for both SK and SKW series.

Notes: For more than 12 circuits, miniature connectors or rectangular format, ask about the ABB Pos-E-Kon® line.

Control circuit connections
Type SK

Specifications
- Receptacle housing:
  - Furnished with neoprene gasket and 6-32 mounting screws
  - Type SKWR – Cast aluminum, corrosion-resistant copper free alloy
  - Style SKR – Heavy-gauge steel, plated
- Plug housing:
  - Type SKP – Steel, zinc-plated with heavy-cast aluminum alloy cable clamp and cable bushing
  - Type SKWP – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish; furnished with heavy-cast cable clamp and cable bushing
- Connector housing: cast aluminum, corrosion-resistant copper-free alloy, epoxy powder coat finish; furnished with heavy-cast cable clamp and cable bushing
- Conduit boxes: cast boxes for above receptacles are listed on page 145; Type SK receptacles require FD series or DSFD box; can be furnished with single-gang outlet box at additional cost; when required, add suffix catalog number of box to catalog number of receptacle
- Cable bushing: oil-resistant neoprene strain relief cable bushing regularly furnished with hole size as listed; other hole sizes available at no extra cost if specified on order; see page 148 for additional sizes
- Interiors: contacts are removable and have pressure type terminals for 12 AWG maximum conductors
- Insulating bodies: Arc- and impact-resisting mold composition
- Contacts: silver plated with fully insulated pressure screw-type terminals
- Repair kits: pins/sleeves repair – components for rebuild of 2–4 interiors
  - Male devices – Cat. no. SKX12MS
  - Female devices – Cat. no. SKX12FA

Indoor, NEMA 1
20 A load breaking
250 V DC
600 V AC (maximum rating)





Poles/ wires	Female receptacle style SKR	Male plug style SKP	Standard service: Female connector style SKC	Reverse service: Male receptacle style SKRR	Reverse service: Connector*/ female plug style SKCU	Cable bushing hole I.D. (in.)
2P3W	SKR3G	SKP3G	SKC3G	SKRR3G	SKCU3G	5/8
3P4W	SKR4G	SKP4G	SKC4G	SKRR4G	SKCU4G	5/8
4P5W	SKR5G	SKP5G	SKC5G	SKRR5G	SKCU5G	3/4
5P6W	SKR6G	SKP6G	SKC6G	SKRR6G	SKCU6G	3/4
6P7W	SKR7G	SKP7G	SKC7G	SKRR7G	SKCU7G	3/4
7P8W	SKR8G	SKP8G	SKC8G	SKRR8G	SKCU8G	7/8
8P9W	SKR9G	SKP9G	SKC9G	SKRR9G	SKCU9G	7/8
9P10W	SKR10G	SKP10G	SKC10G	SKRR10G	SKCU10G	1
10P11W	SKR11G	SKP11G	SKC11G	SKRR11G	SKCU11G	1
11P12W	SKR12XG	SKP12XG	SKC12XG	SKRR12XG	SKCU12XG	1

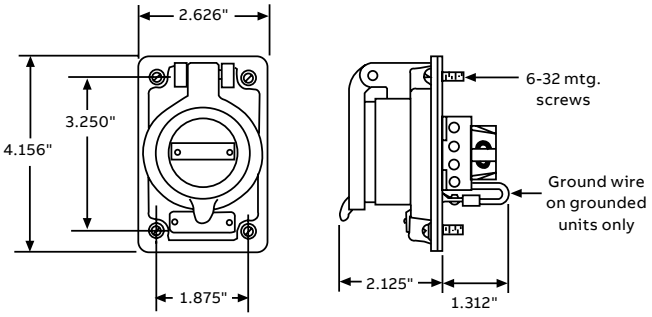
* Connectors: Both SKCU and SKC connectors will mate with standard service SKP plugs. SKC devices offer external shroud protection for female contacts. Both devices will lock with plug.
Note: With conduit fittings, plugs and connectors can be furnished with adapters to accommodate rigid conduit or standard connectors for armored and non-metallic cable or flexible conduit. See page 148. Special construction: press control lockout dummy, Cat. #SKPD-.

Control circuit connections

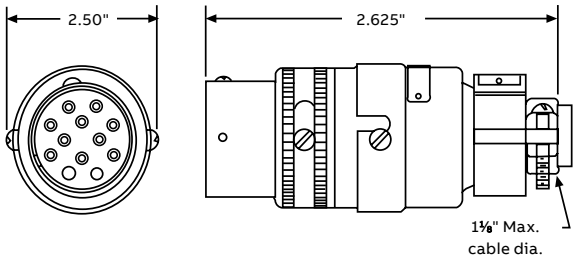
Type SK

Standard service

Female receptacle – Style SKR



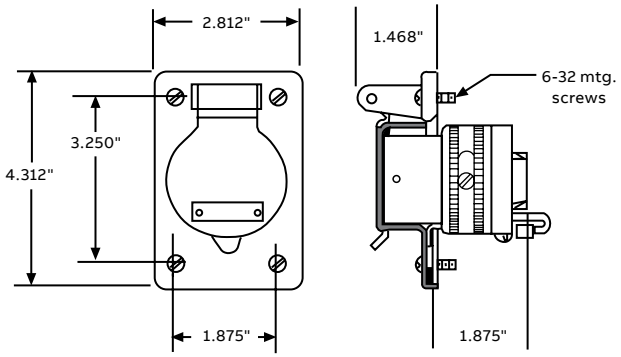
Male plug – Style SKP



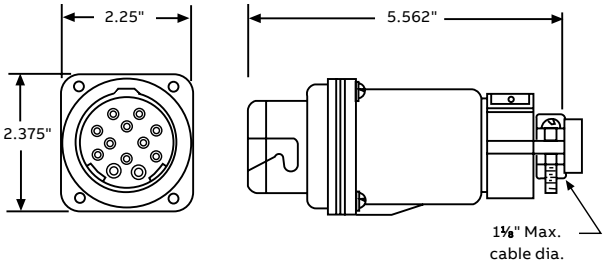
Note: All require FD or DSFD series box mounting.

Reverse service

Male receptacle – Style SKRR

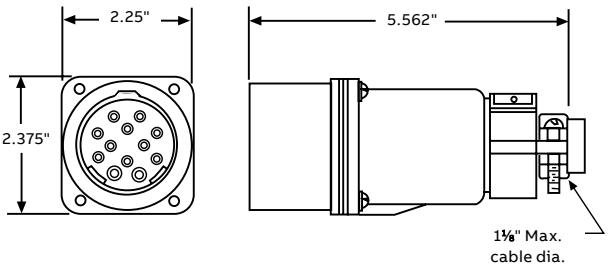


Female plug – Style SKCU (non-shrouded connection)



Connector

Female connector – Style SKC (shrouded style)



Control circuit connections

Type SKW

Specifications

- Receptacle housing: Type SKWR – Cast aluminum, corrosion-resistant copper-free alloy; furnished with neoprene gasket and stainless steel 6-32 mounting screws
- Plug and connector housing: heavy-cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish; furnished with heavy-cast cable clamp and cable bushing.
- Conduit boxes: cast boxes for above receptacles are on page 145; can be furnished with single-gang outlet box at additional cost; when required, add suffix catalog number of box to catalog number of receptacle
- Cable bushing: oil-resistant, neoprene strain relief cable bushing regularly furnished with hole size as listed; other hole sizes available at no extra cost if specified on order; see page 148 for additional sizes
- Protective caps: waterproof caps complete with mounting cable
- Male devices – Cat. no. F26874C (cup cap) Female devices – Cat. no. F04077 (screw cap)
- Repair Kits: pins/sleeves repair – components for rebuild of 2–4 interiors
  - Male devices – Cat. no. SKX12MW
  - Female devices – Cat. no. SKX12FA

Outdoor, NEMA 4 (with screw cap)
20 A load breaking
600 V AC max.
250 V DC




Poles/ wires	Female receptacle style SKWR	Male plug style SKWP	Female connector style SKWC	Male motor plug style SKWM	Cable bushing hole I.D. (in.)
2P3W	SKWR3G	SKWP3G	SKWC3G	SKWM3G	5/8
3P4W	SKWR4G	SKWP4G	SKWC4G	SKWM4G	5/8
4P5W	SKWR5G	SKWP5G	SKWC5G	SKWM5G	3/4
5P6W	SKWR6G	SKWP6G	SKWC6G	SKWM6G	3/4
6P7W	SKWR7G	SKWP7G	SKWC7G	SKWM7G	3/4
7P8W	SKWR8G	SKWP8G	SKWC8G	SKWM8G	7/8
8P9W	SKWR9G	SKWP9G	SKWC9G	SKWM9G	7/8
9P10W	SKWR10G	SKWP10G	SKWC10G	SKWM10G	1
10P11W	SKWR11G	SKWP11G	SKWC11G	SKWM11G	1
11P12W	SKWR12XG	SKWP12XG	SKWC12XG	SKWM12XG	1 1/8

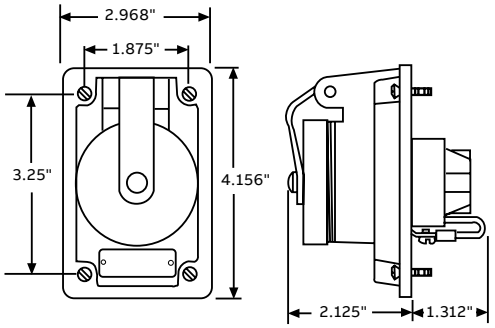
Note: SKWM male inlet accommodates SKWC connector (female). Plugs and connectors can be furnished with adapters to accommodate rigid conduit or standard connectors for armored and non-metallic cable or flexible conduit. See page 148.

Control circuit connections

Type SKW

Receptacle

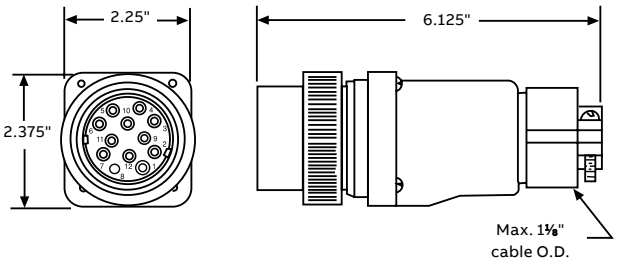
Style SKWR



Note: All require FD or DSFD series box mounting.

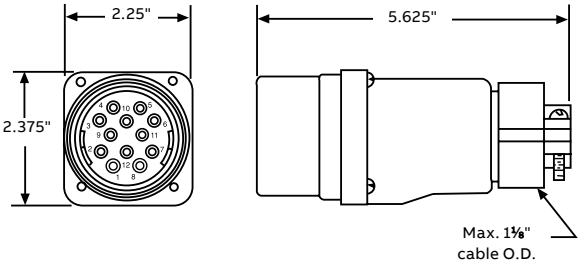
Plug

Style SKWP



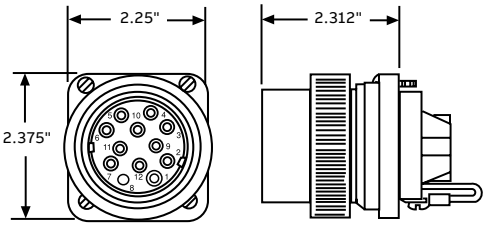
Connector

Style SKWC



Motor plug

Style SKWM



Control circuit connections

Type FS (shallow) and Type FD (deep)

Single-gang

Two-gang

DSFD

- Aluminum boxes have 6-32 cover mounting holes tapped to accommodate all FS and FD cover assemblies.
- Brass boxes have 10-24 cover mounting holes tapped to accommodate all FS and FD cover assemblies.

Type FS (shallow) and Type FD (deep)

Gangs	Type	Cast aluminum	Cast brass	Overall dimensions* (in.)
Single	FS	3701A	3721–RS	4.12 x 2.62 x 2.31
	FD	3711A	3731–RS	4.12 x 2.62 x 2.94
	DSFD	3781A	–	4.12 x 3.62 x 4.12
Two	FS	3702A	3722–RS	4.12 x 5.5 x 2.25
	FD	3712A	3732-RS	4.12 x 5.62 x 2.87

* Dimensions are overall exclusive of conduit pads and mounting lugs.
Notes:
When Type FD devices are to be mounted in boxes, Type FD boxes should be used. FS boxes will not accommodate FD devices.
Mounting – All the above boxes are for surface mounting. For flush mounting, see page 146.
Boxes – Cast brass, natural finish. Cast aluminum, corrosion-resistant, copper-free alloy, epoxy powder-coat finish.
Outlets – Unless otherwise specified, furnished with one 0.75 outlet per gang, top or bottom.
Additional outlets charged extra – See price list. Specify size and location.
Maximum conduit – FS and FD: 1; one per gang top and bottom and one each side.
DSFD – One 1.5 or two 0.5 top and bottom.
Cast iron available on special order – Consult your ABB representative.

Type FSWS and FDWS (with mounting shelf for box-mounted devices)

- Aluminum die-cast boxes with cover mounting holes tapped for 6-32 screws to accommodate all FS and FD cover assemblies.

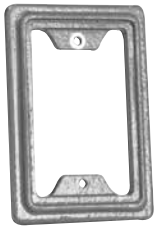
Type FSWS and FDWS (with mounting shelf for box-mounted devices)

		Standard outlets
Cat. no.	Top (in.)	Bottom
FSWS-62	¾	–
FDWS-62	¾	–
FDWS-622	¾	¾
FDWS-63	1	–
FDWS-633	1	1

Note:
Boxes – Aluminum die-cast, corrosion-resistant copper-free alloy, epoxy powder-coat finish.
Outlets – Standard as listed.
Mounting – All of the above boxes are for surface mounting.

Control circuit connections

Control circuit connector accessories



Adapter flush frames*

Gangs	Cast aluminum	Cast brass	Overall dimensions (in.)
1	3671A	3681	5 x 3.5
2	3672A	3682	5 x 6.5

* Furnished complete with gasket and screws. Material – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish. Cast brass, natural finish.

Blank cover*

- Covers standard FS/FD™ box openings.

Cat. no.	Material
3677A	Cast aluminum
3687	Cast brass

* Furnished complete with gasket and screws. Material – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish. Cast brass, natural finish.

Flush wall mounting extension*

Cat. no.	Material
3679A	Cast aluminum
3679B	Cast brass

* Furnished complete with gasket and screws. Material – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish. Cast brass, natural finish.

45° Angle adapter*

- Mounts to any FS/FD™ box.

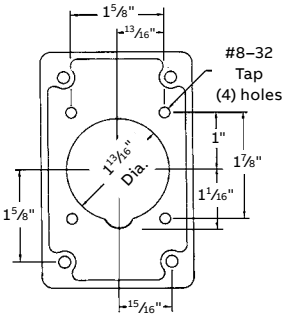
Cat. no.	Material
3678A	Cast aluminum
3678B	Cast brass

* Furnished complete with gasket and screws. Material – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish. Cast brass, natural finish.

Adapter sub-plate

- The addition of this adapter sub-plate will permit the use of Ever-Lok® conduit box-type receptacles in switch boxes or outlet boxes with raised covers, as listed. Used on standard (deep) stamped metal conduit boxes. Adapts two-hole to four-hole patterns.

Cat. no.	Material
8091A	Cast aluminum



SKWM mount adapter plate

- Used to mount SKWM to FS/FD™ standard series boxes.

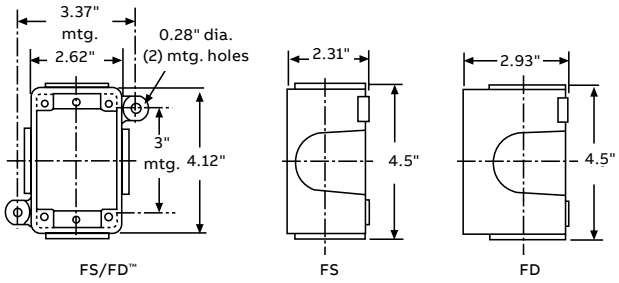
Cat. no.	Material
SKWMFS	Aluminum

Control circuit connections

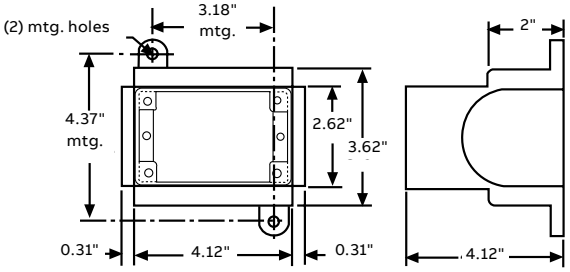
Dimensions

Type FS and FD

Single-gang



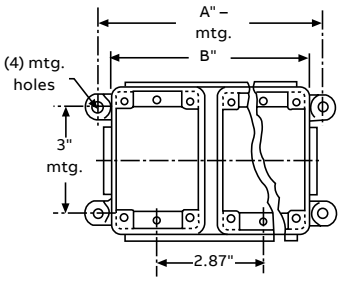
DSFD



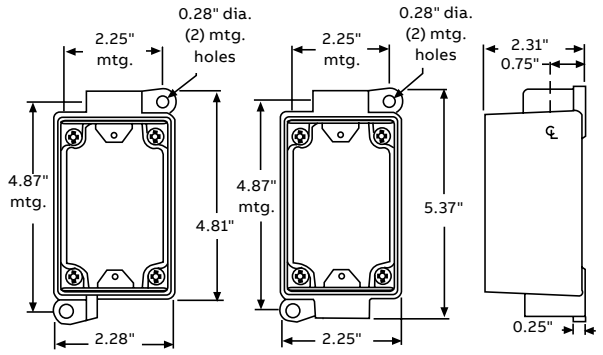
Multiple-gang dimensions

No. of gangs	A		B	
	FS	FD	FS	FD
2-gang	6.50"	6.50"	5.50"	5.62"

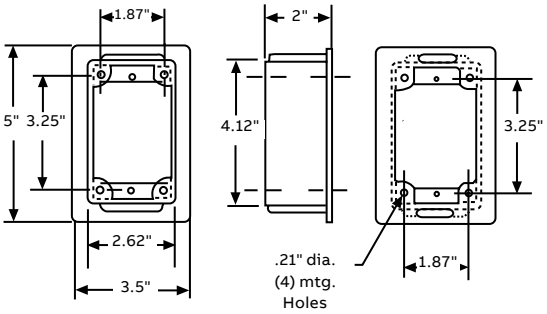
Multiple-gang



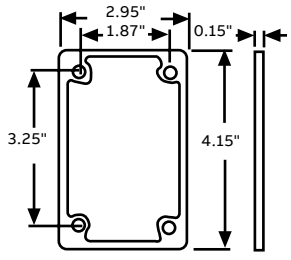
Type FSWS and FDWS



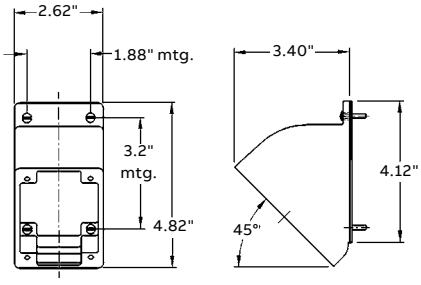
Flush mounting extension



Blank cover



45° Angle adapter



Control circuit connections

- Provides extra clamping protection in hard service applications. Relieves terminals and rubber gland of all cable strain.

Combination gland nut and cable clamp

Plug or connector size	Cast aluminum Cat. no.	Cast brass Cat. no.	Max. cable dia. (in.)
20 A and SKW	3906	3906B	1⅛

Note: Material – Cast aluminum, corrosion-resistant copper-free alloy, epoxy powder-coat finish or cast brass, natural finish.

- Adapter tapped with NPT thread to accommodate armored and non-metallic cable or flexible conduit.

Adapters for conduit

Plug or connector size	Cast aluminum Cat. no.	Cast brass Cat. no.	Tapped hole NPSM (in.)
20 A and all SKW	FSA21	FSA21B	½
	FSA22	FSA22B	¾
	FSA23	FSA23B	1

Size 3 cable bushing

Cable bushings

Hole diameter for cable (in.)	Size 3 20 A
0.375	JG31
0.500	JG32
0.563	JG325
0.625	JG33
0.750	JG34
0.875	JG35
1.000	JG36*
1.125	JG361**

Material – Oil-resistant Neoprene. Size 3 cable bushing: * Style for maximum cable only. ** Special minimum wall style.
Notes: When standard plugs or connectors are required to be furnished with one or more of the above accessories, add the suffix and catalog number of the accessory separated by a / to the catalog number of the plug or connector. Complete list price is the total of the list price of the device plus the list price of the accessory.
Example: catalog no. SKP9G with 1 bushing would be catalog no. SKP9G/JG36.

Industrial interlocked receptacles

Industrial interlocked receptacles are available in 30 through 400 A. Switched receptacles have mechanical linkages for added safety. Safety features include:

- Plugs cannot be inserted unless power is safely turned off
- Plugs cannot be removed until power is safely turned off
- Specialty designs may also automatically disengage power if plug is removed while power is on, either mechanically or electrically

Applications

Applications where these units are most commonly used are:

- Welding stations in automotive and heavy industry
- Temporary and portable power distribution for construction
- Marine shore-to-ship power
- Industrial machinery installation
- Portable power distribution, vehicle and gen-set power for aerospace
- Custom systems in all industries

Sample installation: Fixed power source (wall) to remote/portable location

01. Receptacle (wall-mounted female)

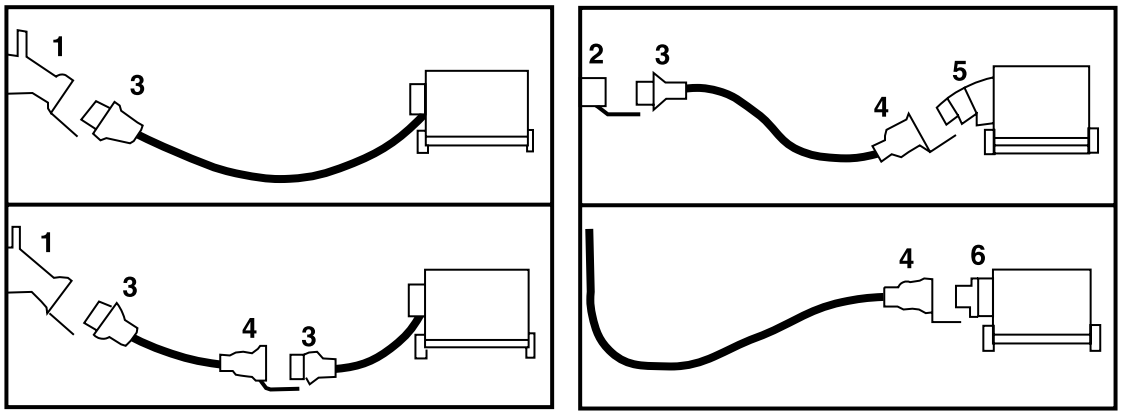
02. Receptacle (panel-mounted female)

03. Plug (attachment)

04. Female connector

05. Male Inlet with angle adapter

06. Male inlet with straight adapter



Other installations: generator power sources, custom control circuits, multiple voltage service – contact technical services.

Industrial interlocked receptacles

Mounting options

Industrial wall-mount interlocks

- Indoor service NEMA 3R
- Fused protection
- 30–100 A models, 600 V
- Heavy service Ever-Lok® or Max-Gard® interfaces

Automotive/heavy industrial I-beam web-mount

- Indoor service NEMA 12/3R
- Fused or circuit breaker protection
- 30–100 A models, 600 V
- Stepdown transformer-disconnect designs with convenience outlets
- Cast aluminum and sheet steel housing versions
- Mounts inside web of standard 8" I-beam column
- Interfaces with heavy service Ever-Lok, Max-Gard®, standard Ever-Lok and FS/FD™

Marine/heavy industrial and custom

- Outdoor service NEMA – 3R to 4X
- Switched or circuit breaker protection
- 30–400 A models, 600 V
- Cast aluminum or cast brass
- Mounting to customer specifications
- Interfaces with Max-Gard®, FS/FD™ and more

Industrial interlocked receptacles

Max-Gard® fused-disconnect** interlocked receptacle with disconnect switch

Max-Gard® fused-disconnect interlocked receptacle with safety switch meets UL®, NEC® and major automotive specifications. This unit is the maximum in:

Safety
- Door safety switch with three external lockout points
- Safety fuse pulls for standard class R fuses
- Backup door safety latch

Durability
- Heavy 0.060" steel galvaneel with baked enamel, NEMA 3R/12 construction
- Clear shield for test probes

Performance
- Standard 600 V cartridge fuse clips and spacing
- Fully interlocked Max-Gard® receptacle
- Angled front receptacle for easier access

Ordering information
Maximum 600 V AC or 250 V DC

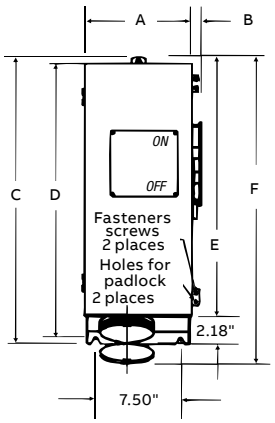
Conduit hubs

Amp	Std. NPT thread outlet (in.)	Max. outlet (in.)
30	1½	2½
60	2	2½
100	2	2½

Specifications on pages 36–37.

Notes: **Non-fused, non UL® version available: Specify DNRF _____ . Standard polarizations shown. Boldface figures are for voltage assignment; for different ratings, see page 38.

Dimensions



E5239

Amps	Poles/ wires	Voltage (V AC)	Fused disconnect** interlocked receptacle NEMA 12/3R Cat. no. ▼	Mating Max-Gard plug Cat. no.	Std. bushing I.D. (in.)
30	2P3W	125	DFRF3**1070**	DS3**107**MP000	7/8
	2P3W	250	DFRF3**2070**	DS3**207**MP000	7/8
	3P4W	3Ø250	DFRF3**3070**	DS3**307**MP000	1
	3P4W	3Ø480	DFRF3**4040**	DS3**404**MP000	1
	4P5W	277/480	DFRF3**5040**	DS3**504**MP000	1 3/16
60	2P3W	250	DFRF6**2070**	DS6**207**MP000	1 3/16
	3P4W	125/250	DFRF6**3070**	DS6**307**MP000	1 5/16
	3P4W	3Ø480	DFRF6**4040**	DS6**404**MP000	1 5/16
	4P5W	277/480	DFRF6**5040**	DS6**504**MP000	1½
100	2P3W	250	DFRF1**2070**	DS1**207**MP000	1 11/16
	3P4W	125/250	DFRF1**3070**	DS1**307**MP000	1 13/16
	3P4W	3Ø480	DFRF1**4040**	DS1**404**MP000	1 13/16
	4P5W	277/480	DFRF1**5040**	DS1**504**MP000	2

▼ Control Contacts (position 9) use K example: DFRF1207K.
Always use liquidtight fittings to limit condensation entry.

E5239

	Dimensions (in.)					
Amp	A	B	C	D	E	F
30	9½	¾	25¾	25	22¾	30
60	9½	¾	25¾	25	22¾	30
100	9½	¾	25¾	25	22¾	30

Industrial interlocked receptacles

Fused-disconnect interlocked receptacle/safety switch

Heavy service Ever-Lok® 60 A

Standard fused/non-fused disconnect interlocked receptacle and safety switch is specified by major automotive manufacturers for welding disconnects and other applications. The heavy service Ever-Lok® system features "one-handed" insertion, locking and removal with your choice of switchgear!

Benefits

- Specified switchgear: GE or Square D
- Door safety switch with external lockout access
- Backup door safety latch
- Push-in plug locking: no screw collars needed
- Full interlocked outlet protection and functions
- Angled front receptacle in compact one-handed interlock

Options (custom capabilities)

- Other Russellstoll product interfaces
- 30, 60, 100 or 200 A installations
- Specialty enclosures for your application
- Circuit breaker interlocked mechanisms

See pages H-426–H-432 for full heavy service Ever-Lok line.

Features

- Heavy steel galvaneel with baked enamel finish
- NEMA 3R/12 construction
- Standard 600 V class R fuses
- Listed components

GE switchgear

Cat. no.	Mating plug
TH3362JRS (60 A)	8418 or F27194†

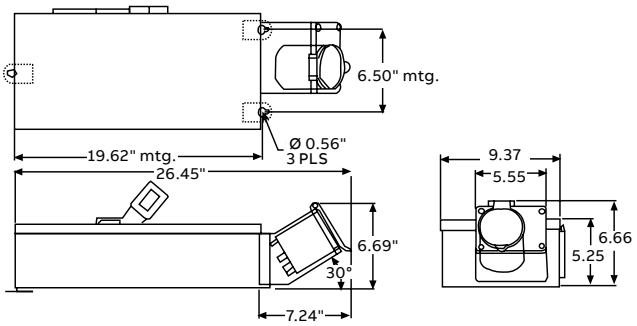
† F27194 Automotive, 480 V AC label.
Notes: Mating plugs sold separately. Other styles available.

Square D (mechanism)

Cat. no.	Mating plug
ESDFH8414F00	8418 or F27194†

† F27194 automotive, 480 V AC label.
Notes: Mating plugs sold separately. Other styles available.
Also available: Many options for mounting, configuration or interfaces.

Dimensions



Industrial interlocked receptacles

Combination interlocked transformer disconnect automotive/heavy industrial I-beam web mount

60 A, 480 V AC plus 120 or 240 V AC convenience outlets to specification 3P4W (100 A also available)

Benefits

Transformer disconnects offer a combination of voltage outlets from a single facility 480 V 3Ø service drop. Standard configurations include a fused, interlocked 480 V AC, 60 A 3Ø receptacle outlet and separately protected 120 V AC, 15–20 A convenience outlets. Custom configurations are available to meet your application requirements.

- Quickest way to expand or build a single voltage factory or facility, with voltage combinations available at every power drop
- Safest way to operate: with fuses and breaker protection for each receptacle; 60 A plug cannot be inserted or removed unless power is off
- Most cost-effective way of providing power and convenience outlets in one location; wall mount or column mount in standard 8" I-beam pillars

Mechanical and safety features

- Three-point, two-way interlock function
  - Blade-type disconnect handle interlocked with door handle
  - Main disconnect uses steel rod arm interlock to 480 V AC outlet
- High-strength 3-point door hinge design
- Standard 8" I-beam web vertical mounting or conventional wall mount
- Easy access angled front 480 V AC receptacle position
- Heavy-duty 14-gauge steel NEMA 3R/12 welded enclosure with gasketed door; electrostatic epoxy powder-coat gray finish
- Dual lockout locations on main switch handle and door handle

Optional construction features

- Stepdown transformer 2 kVA and secondary
- 30/60 A outlet (heavy service Ever-Lok®, angle type or 30 A Max-Gard®)
- Convenience outlet types (including NEMA bladed styles) and protection

Ordering information

- Many other configurations available

Specifications

Electrical and safety features:

- Fused 480 V AC 60 A 3P4W receptacle + fused dual 120 V AC 20 A 2P3W outlets
- 20 A combination breaker/GFCI convenience outlets on door
- Heavy-duty (8-hour rated) 2 kVA 480 V AC–120 V AC (fused primary) transformer

Combination interlocked transformer disconnect automotive/heavy industrial I-beam web mount

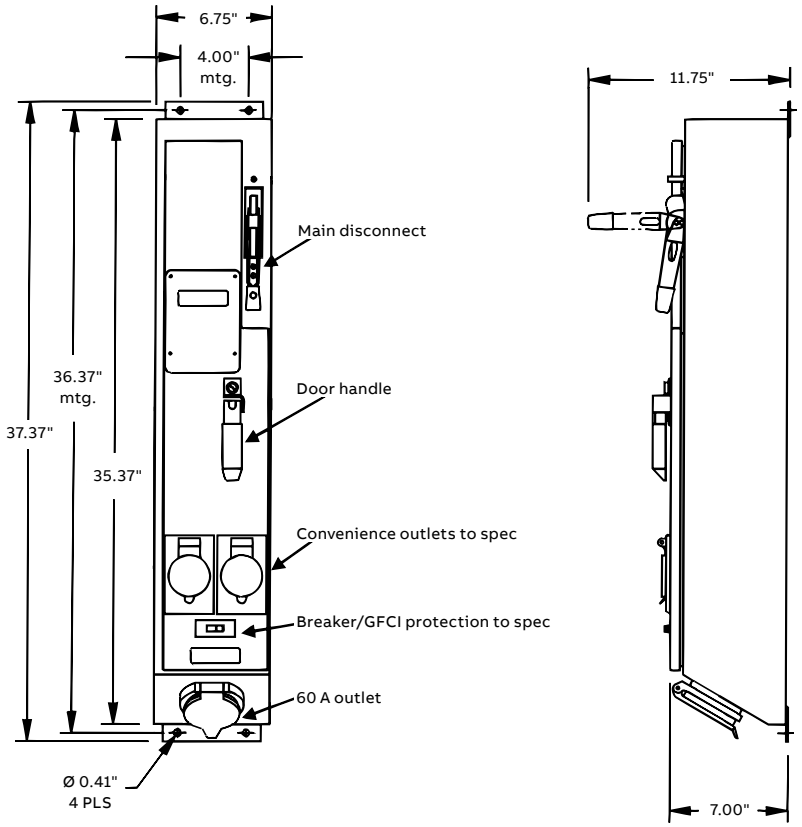
E57324

Cat. no.	480 V AC, 60 A receptacle	Mating plug	120 V AC, 20 A receptacle	Mating plug
ERSFH8414FBB	8414Spl.	8418 or F27194†	8003N (x2)	8593CTN*
ERSFH8414FDC	8414Spl.	8418 or F27194†	8003U-1 (x2)	8013U-1*

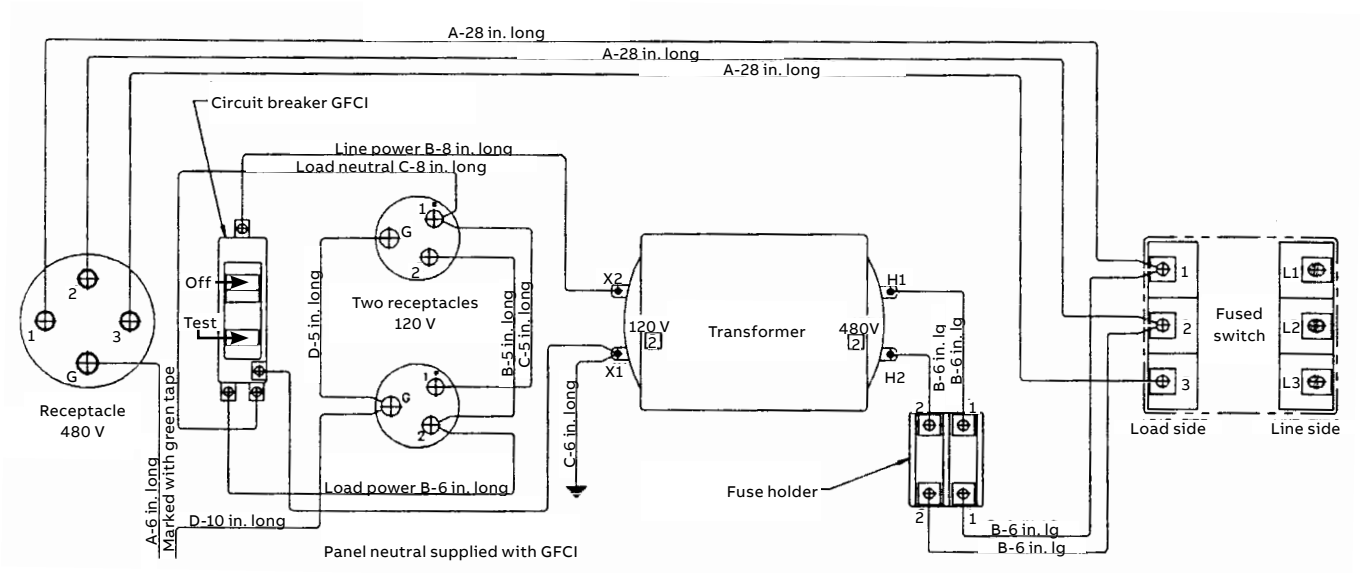
* Other styles available.
† F27194 automotive 480 V AC label.
Notes: Mating plugs sold separately.
100 A also available – Consult your ABB representative.

Industrial interlocked receptacles

Dimensions



Wiring diagram



Industrial interlocked receptacles

Ever-Lok® mechanically interlocked receptacle and switch automotive/heavy industrial I-beam web mount heavy service Ever-Lok mechanically interlocked receptacles and switch

60 A, 480 V AC/250 V DC, 3P4W circuit breaker interlocked receptacle option

Features and benefits

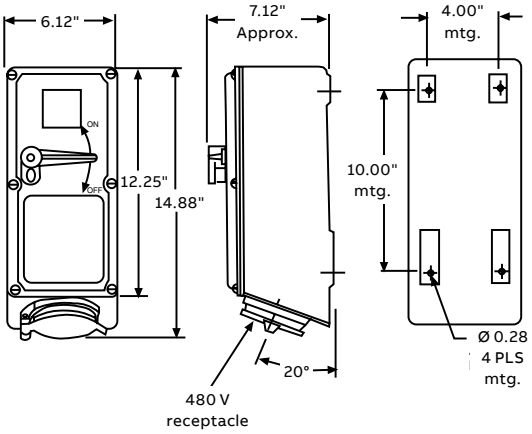
Mechanically interlocked between the receptacle and the switch. Designed so that when the plug is fully inserted, the switch interlock is automatically released, permitting the switch to be turned on. The plug cannot be removed from the receptacle until the switch is manually turned off.

- Switch: 60 A, 480 V AC, 3-pole, quick “make” and quick “break”
- Housings: heavy-cast aluminum corrosion-resistant copper-free alloy with gray electrostatic epoxy powder-coat finish; furnished with oil-resistant gaskets
- Handle lock-out feature
- Circuit-breaker interlocked version available in standard and high AIC models
- One-handed insertion or removal: unique auto-locking collar engages upon insertion, ⅛ counter-clockwise turn disengages for removal
- Simple and rugged full interlock safety; plug cannot be inserted or withdrawn while power is on
- Fits in standard 8" I-beam web or wall mounting

Interlock Cat. no.	Mating type	Plug
CFCSRA13-60	Switched only	8418 or F27194†
F32753‡	Circuit breaker	8418 or F27194†

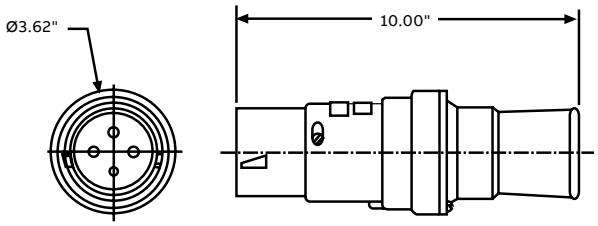
† Automotive 480 V AC.
‡ 70 A Trip version F26313 and other variations also available.
Notes: CFCSRA13-60 replaces previous Cat. #FCSRA13-60.
Mating plugs sold separately.

Dimensions



*17" dim. for F32753 unit

Mechanically interlocked switch
1¼" NPT top entry std./Other sizes available



Mating plug
60 A, 3P4W, 8418 or F27194

Industrial interlocked receptacles

Interlocked switch (30 A, 480 V AC) automotive/heavy industrial I-beam web mount interlocked switch (FS/FD™ interface)

30 A, 480 V AC, 3P4W (other polarizations available)

Features and benefits

The FS/FD interlocked switch is made of heavy-duty cast aluminum. The mechanical interlock functions when the plug is fully engaged, enabling the switch to be operated. Basic interlock design has many variations including screw cover, brass and circuit breaker versions.

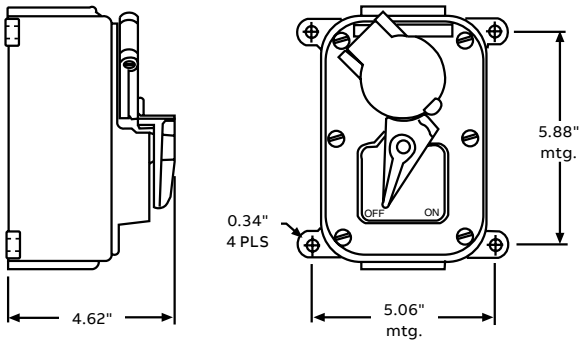
- Male plug cannot be plugged or unplugged under load
- Deadfront female receptacle for safety
- Weathertight receptacle made of cast aluminum, corrosion-resistant copper-free alloy, gray electrostatic epoxy powder-coat finish
- Compact size for limited space applications
- Available with UL® style steel back boxes to user specifications

Interlocked switch (30 A, 480 V AC) automotive/heavy industrial I-beam web mount interlocked switch (FS/FD™ interface)

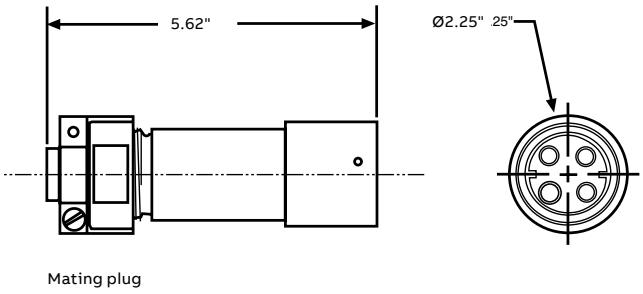
Cat. no.	Mating plug
F34331	F34332

Mating plugs sold separately.

Dimensions



Interlocked switch



Mating plug

Industrial interlocked receptacles

Maximum 600 V AC/250 V DC

Max-Gard® NEMA 4X interlocks are ideal for demanding non-hazardous areas where dust, dirt, moisture and corrosion might be a problem – such as shipyards, food processing facilities, manufacturing operations or similar areas.

Safety

- Gated deadfront waterproof receptacle
- Standard, high AIC or NA/switch circuit breaker
- Protective screw cap for watertight protection

Durability

- Thick-wall cast copper-free aluminum housing with epoxy powder-coat finish
- Heavy-duty sliding bar interlock mechanism

Performance

- Heavy on/off handle adds mechanical ability to electrical interlock function
- Standard conduit openings through top or side

Boldface figures are for voltage assignment; for different ratings, see page H-346.

Amps	Poles/ wires	Voltage (V AC)	Mechanically interlocked receptacle NEMA 4X Cat. no. ▼	Mating Max-Gard plug Cat. no. ▼	Std. bushing I.D. (in.)
30					
	2P3W	125	DBRF3**10**703000	DS3**107**MP000	7/8
	2P3W	250	DBRF3**20**703000	DS3**207**MP000	7/8
	3P4W	3Ø250	DBRF3**30**703000	DS3**307**MP000	1
	3P4W	3Ø480	DBRF3**40**403000	DS3**404**MP000	1
	4P5W	277/480	DBRF3**50**403000	DS3**504**MP000	1 3/16
60	2P3W	250	DBRF6**20**706000	DS6**207**MP000	1 3/16
	3P4W	125/250	DBRF6**30**706000	DS6**307**MP000	1 5/16
	3P4W	3Ø480	DBRF6**40**406000	DS6**404**MP000	1 5/16
	4P5W	277/480	DBRF6**50**406000	DS6**504**MP000	1 1/2
100	2P3W	250	DBRF1**20**710000	DS1**207**MP000	1 11/16
	3P4W	125/250	DBRF1**30**710000	DS1**307**MP000	1 13/16
	3P4W	3Ø480	DBRF1**40**410000	DS1**404**MP000	1 13/16
	4P5W	277/480	DBRF1**50**410000	DS1**504**MP000	2
200	3P4W	277/480	DBRF2**30**720000	DS2**307**MP000	1 1/4
	3P4W	3Ø480	DBRF2**40**420000	DS2**404**MP000	2 1/4
	4P5W	277/480	DBRF2**50**420000	DS2**504**MP000	2 1/2
400	3P4W	277/480	DBRF4**30**740000	DS4**307**MP000	3
	3P4W	3Ø480	DBRF4**40**440000	DS4**404**MP000	3
	4P5W	277/480	DBRF4**50**440000	DS4**504**MP000	3 1/4

Conduit hubs: (at B or E)

Amp	Std. NPT thread outlet (in.)	Max. outlet (in.)
30	1 1/2	2 1/2
60	1 1/2	2 1/2
100	2	2 1/2

▼ **Control contacts** (position 12) use "K" example: DBRF6104060K0

Shunt trip breaker (position 13) add "Z" to above: DBRF6104060KZ

Breaker trip ratings (positions 9, 10, 11) 30 A use 030; 50 A use 050; 60 A use 060

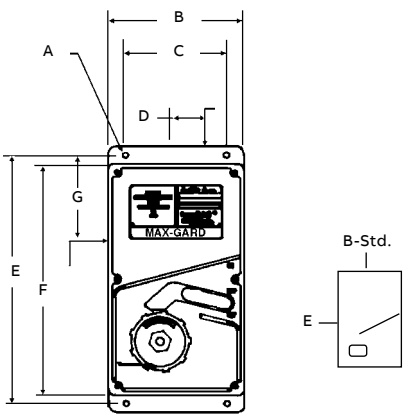
Non-auto Sw. NA0 (repl." DBRF" with "DSRF")

For additional full line and polarization options, see Max-Gard section on pages 6–47.

Dimensions

Amp	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)
30	3/8	8 3/4	6 1/2	1 1/2	16 1/4	15 1/8	3 1/8
60	3/8	8 3/4	6 1/2	1 1/2	16 1/4	15 1/8	3 1/8
100	3/8	8 3/4	6 1/2	1 1/2	16 1/4	15 1/8	3 1/8
200	9/16	12 1/4	9	2 1/2	26 1/4	24 3/4	5
400	9/16	15 1/2	12	3	30 1/2	29	6

Dimensions



Hazardous location plugs, receptacles and interlocks

Hazardous-duty applications

Russellstoll® hazardous-duty plugs, receptacles and interlocks are designed to support a variety of installation needs throughout 20 A, 30 A, 60 A and 100 A ranges where Division 1, Class 1 NEC® guidelines require the utmost in safety.

Unique among others, the Russellstoll Max-Gard® also offers true O-ring sealed waterproof design protection in addition to standard threaded flame-path construction employed elsewhere. In rough service, washdown and outdoor applications, Max-Gard performance goes beyond normal XP ratings.

With coming increases in harmonized designations for classifications between NFPA/NEC® and IEC (international) hazardous area standards, a quick reference classification chart is provided below. In all cases, the customer must determine and approve proper area classification standards and degree of harmonized standards acceptance.

Hazardous-duty applications

Hazardous materials environment	U.S. NEC standards	Euro IEC standards
Gas or vapor	Div. 1, Class I	Zone 0 and 1
	Div. 2, Class I	Zone 2
Dust	Div. 1, Class II	Zone 10
	Div. 2, Class II	Zone 11
Fibers/flyings	Div. 1, Class III	Zone 10
	Div. 2, Class III	Zone 11
Group applications	NEC art. 500 Class I: groups	NEC art. 505 Zones 0, 1 and 2
Div. 1 and 2, Class I	A: Acetylene	IIC
	B: Hydrogen	
	C: Ethylene	IIB
	D: Propane	IIA

The above chart is presented for quick reference only and should only be used in conjunction with noted Articles.
Further definition of harmonized standards will be supported by Russellstoll through appropriate specification efforts whenever practical.

Hazardous location plugs, receptacles and interlocks

Interlocked switch and receptacles

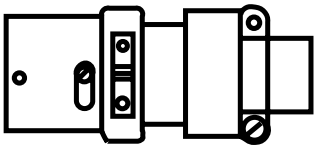
Explosion-proof:
Class I, groups C and D
Dust ignition-proof:
Class II, groups G

These receptacles are for use in general Div. 1 classified industrial installations such as chemical plants, oil refineries, bulk stations, distilleries, solvent areas, mills, etc. A higher degree of safety is afforded by interlocking the plug with the switch, making it impossible to insert or withdraw plug under load.

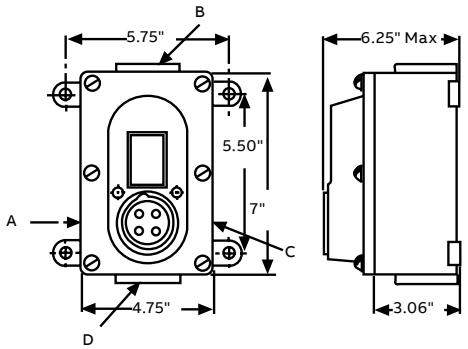
When the polarized plug is inserted into the receptacle and the plug shell is turned clockwise, it turns the switch to the “on” position and vice-versa.

20 A, 575 V AC
30 A, 250 V AC

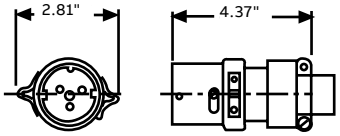
Description	Flap cover	Screw cover	Plug	Cable std. bushing hole dia. (in.)
2P3W 1 HP 220/575 V AC	4240FC/ F16081A	4240SC	4241	5/8
3P4W 2 HP 110/575 V AC	4242FC	4242SC	4243	3/4



Dimensions



For 2-gang unit, width is 9 3/8".
Mounting lugs – C to C 10½" W x 5½" H



Specifications

- Receptacle housings: cast aluminum; electrostatic epoxy powder coated finish
- Plugs: steel, cadmium plated; furnished with aluminum alloy cable clamp and neoprene cable bushing
- Outlets: standard ¾" top, additional or larger outlets available; maximum 1" four way; see diagram, use symbols when ordering
- Cable bushing: oil-resistant, neoprene strain relief cable bushing regularly furnished with hole I.D. size as listed; other hole sizes available; consult technical services for catalog number
- Two-gang style: consult technical services

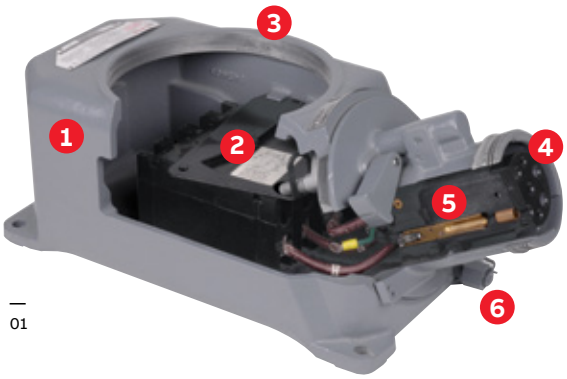
Approvals: E10919

Hazardous location plugs, receptacles and interlocks

Max-Gard® DBRE and DSRE Series Interlocks are certified both explosion-proof and waterproof, along with optional control contacts, and are fully UL® listed.

01 Approvals
- UL and CSA listed for hazardous locations
- Class I, division 1, groups B, C and D
- Class II, division 1, groups F and G UL File E10919
- NEMA 7, 8, 9
- CSA
- DOT shipboard used above deck "green water"
- NEMA 4X
- USCG approved

02 Approvals
- UL and CSA listed for hazardous locations
- Class I, division 1, C and D
- Class II, division 1, groups F and G
- UL File E10919
- NEMA 7, 8, 9
- CSA
- DOT shipboard used above deck "green water"
- NEMA 4X
- USCG approved



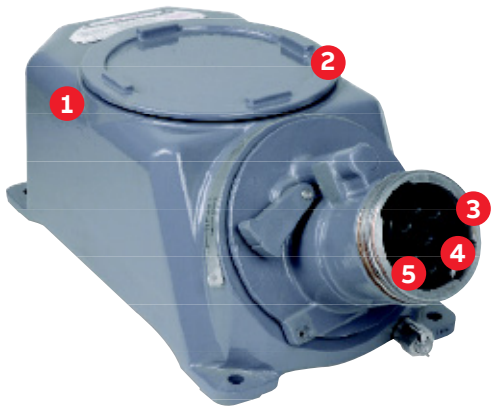
01

E68085

Explosion-proof waterproof circuit breaker interlocked receptacle

Available in 30, 60 and 100-A sizes, all polarizations. Division 1, Class I and II.

1. Heavy-duty XP cast aluminum housing, electrostatic epoxy coat finish
2. Standard, high AIC and NA (switched only) breakers available
3. Threaded access (cover not shown) with O-ring for XP and waterproof integrity
4. Gated deadfront safety
5. Factory-sealed receptacle interior. Accepts standard XP-rated Max-Gard plugs
6. Drain plug



02

E10919

Explosion-proof waterproof circuit breaker interlocked receptacle

Available in 30 A 480 V AC max., all polarizations
- Factory-sealed interior (no filled conduits)
- Easy low-cost installation

1. Heavy-duty XP cast aluminum housing, electrostatic epoxy coat finish
2. Threaded access with (cover not shown) O-ring for XP and waterproof integrity
3. Gated deadfront for safety
4. All standard polarizations available to 480 V AC
5. Factory-sealed receptacle interior Accepts standard XP-rated Max-Gard plugs

Hazardous location plugs, receptacles and interlocks

▼ **Control contacts** (position 12) use “K” example: DBRF6104060K0
Shunt trip breaker (position 13) add “Z” to above: DBRF6104060KZ

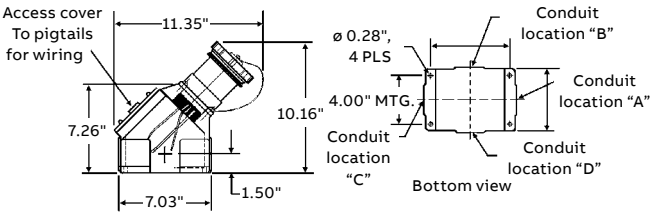
Breaker trip ratings (positions 9, 10, 11) 30 A use 030; 50 A use 050; 60 A use 060
Non-auto switch NA0 (repl. “DBRE” with “DSRE”)

Maximum 600 V AC or 250 V DC

Amps	Poles/ wires	Voltage (V AC)	Cat. no. ▼	Cat. no. ▼	Cat. no. ▼	Std. bushing I.D.* (in.)
Product type			**Explosion-proof interlocked receptacle with circuit breaker, Class I, Class II**	**Explosion-proof receptacle, Class I, Class II**	**Male plug**	
30	2P3W	125	DBRE3**10**703000	DSE3**107**FR0	DS3**107**MP000	⅞
	2P3W	250	DBRE3**20**703000	DSE3**207**FR0	DS3**207**MP000	⅞
	3P4W	3Ø250	DBRE3**30**703000	DSE3**307**FR0	DS3**307**MP000	1
	3P4W	3Ø480	DBRE3**40**403000	DSE3**404**FR0	DS3**404**MP000	1
	4P5W	277/480	DBRE3**50**403000	DSE3**504**FR0	DS3**504**MP000	1 3/16
60	2P3W	250	DBRE6**20**706000	–	DS6**207**MP000	1 3/16
	3P4W	3Ø250	DBRE6**30**706000	–	DS6**307**MP000	1 5/16
	3P4W	3Ø480	DBRE6**40**406000	–	DS6**404**MP000	1 5/16
	4P5W	277/480	DBRE6**50**406000	–	DS6**504**MP000	1½
100	2P3W	250	DBRE1**20**710000	–	DS1**207**MP000	1 11/16
	3P4W	3Ø250	DBRE1**30**710000	–	DS1**307**MP000	1 13/16
	3P4W	3Ø480	DBRE1**40**410000	–	DS1**404**MP000	1 13/16
	4P5W	277/480	DBRE1**50**410000	–	DS1**504**MP000	2

Boldface figures are for voltage assignment; for different ratings, see page 38.
* For specification information and additional bushing sizes, see Max-Gard® section, pages 6–47.

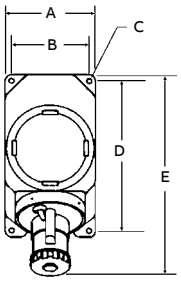
Dimensions



Explosion-proof receptacle

Explosion-proof interlocked receptacle

Amp	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)
30	8¾	7½	½	14¾	20
60	8¾	7½	½	14¾	20
100	8¾	7½	½	14¾	20

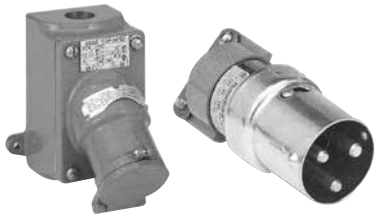


Hazardous location plugs, receptacles and interlocks

Delayed-action receptacles

Circuit-breaking receptacles, plugs and connectors ensure complete circuit breaking under full rated loads. Equipment grounding is provided by means of a separate pole that makes contact before and breaks contact after the circuit poles. The delayed action operation sequence is as follows:

Insert plug, turn left, push in to make electrical contact, then turn right to prevent accidental disconnection. To withdraw plug, the reverse procedure is followed, which provides time for extinction of the arc and cooling before the plug can be completely withdrawn.



Explosion-proof: Div. 1, class 1, groups C and D

Delayed-action receptacles

Ratings	Poles/ wires	Surface mount receptacle** Straight	Surface mount receptacle** Angled	Flush mount receptacles ▼	Plug	Cable hole dia. (in.)
Type EFS	–	–	–			–
20 A	2P3W	4462	4464FC	4445	4466	9/16
125 V AC or 250 V AC	3P4W	–	4465FC	4446	4467	19/32
Type DA	–	–	–	–		
30 A+	2P3W	–	4233BC	_	4237BC	5/8
250 V AC or 480 V AC	3P4W	RA4234BC	4234BC	_	4238BC	3/4
60 A*	2P3W	–	4263BC	_	4267BC	1 1/4
480 V AC	3P4W	RA4264BC	4264BC	_	4268BC	1 1/4

Notes:
* Also available for use at 30 A, 480 V AC.
** Can be furnished with flap or screw cap covers. When so required, add suffix FC for flap or suffix SC for screw cap to above catalog number. Price on application.
▼Furnished with plaster gauge plate. Requires wall depth of 4 minimum.
+ 30 A Iron-bodied plug family for replacement use only. Not UL listed. (60 A carries full listing.)

Hazardous location plugs, receptacles and interlocks

Delayed-action receptacles (EFS and DA)

Specifications

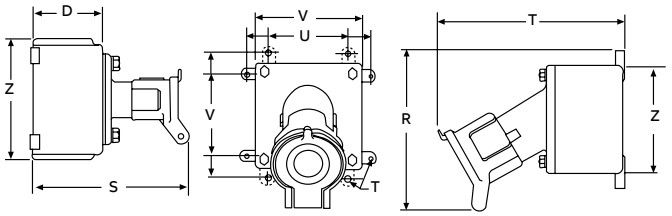
- Receptacle housings: EFS – Cast copper-free aluminum; DA – Cast iron, corrosion-resisting baked enamel finish
- Plug housings: 20 A – Steel, cadmium plated; 30 A – Cast iron; 60 A – Steel and aluminum, natural finish; plugs are furnished with aluminum alloy cable clamp and neoprene cable bushing
- Connectors: Cast aluminum, natural finish; furnished with aluminum cable clamp and neoprene cable bushing
- Flush plates: brass, polished chromium finish
- Outlets: furnished with one outlet top or bottom as follows: 20 A – ¾"; 30 A – 1"; 60 A – 1½"; additional or larger outlets charged extra
- Maximum conduit sizes, four ways as follows: 20 A – 1"; 30 A – 1½"; 60 A – 2"; single gang – top and bottom only; two gang – One per gang top and bottom and one on each side; specify size and location
- Cable bushing: oil-resistant, neoprene strain-relief cable bushing regularly furnished with hole size as listed; other hole sizes available at no extra cost if specified on order; see page 164
- Surface gang units: EFS available and can be furnished in 2-gang units or in combination with other like devices
- Approvals: 20 and 60 A

E10919

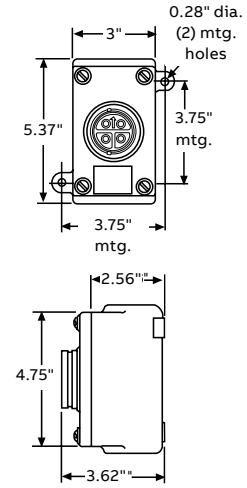
Dimensions

Amp		D (in.)	R (in.)	S (in.)	T (in.)	U (in.)	V (in.)	Y (in.)	Z (in.)
20	Angle	2.56	–	6.12	0.28	3.75	3.75	3	5.37
30	Straight	3.87	–	8.62	0.34	6.12	5	5.25	6.75
	Angle	3.06	7.37	8.37	0.28	3.50	5.50	4.75	4.75
60	Straight	3.87	–	9.25	0.34	6.12	5	5.25	6.75
	Angle	3.87	9	9.25	0.34	6.12	5	5.25	6.75

Type DA (30 and 60 A) straight

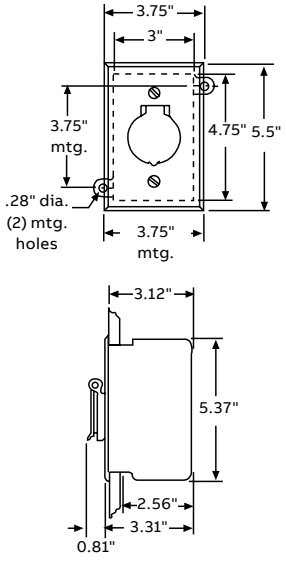


Surface-mount receptacles



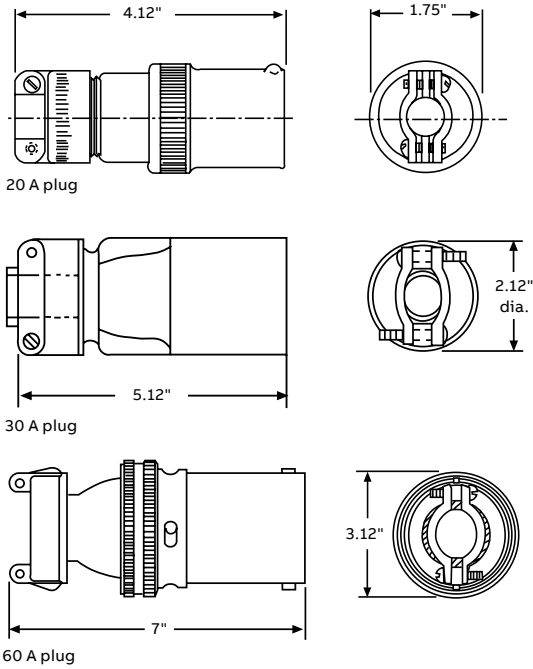
Type EFS (20 A) straight

Flush-mount receptacles



Type EFS

Plug



Hazardous location plugs, receptacles and interlocks

For explosion-proof plugs and connectors

Cable bushings

Cable bushings
To order non-standard bushing, add cable bushing number to end of catalog number. This is furnished at no additional cost at time of order. For 60 A devices, see J-line 60 A chart on page 63.

Cat. no.	Hole diameter for cable (in.)
SG05	0.312
SG1	0.375
SG15	0.438
SG2	0.500
SG2A	0.531

20 A Cat. no.	Hole diameter for cable (in.)
SG25	0.563
SG2B	0.594
SG3	0.625
SG3A	0.687
SG4	0.750

Notes: Cable outside diameter should be at or slightly less than bushing I.D.
Bushings can compress approx. 10% at installation.
To order, add suffix as example: 4466/SG3. Material – oil-resistant Neoprene.

For 20 A delayed-action circuit receptacles

Flap cover assembly

Cat. no.	Finish	Used on cat. no.
F19054C	Chrome plated	4445
F19054D	Natural finish	4464

For 20 A delayed-action circuit plugs – provides extra clamping protection in hard service applications

Combination gland nut and cable clamp

Cat. no.	Used on cat. no.
F24853C	4466
F24853D	4467

Material – Cast aluminum alloy, natural finish.

Hazardous location plugs, receptacles and interlocks

Aerospace/industrial static ground devices

F07073
(cover only)

Static grounding receptacles are used in airport and aerospace installations worldwide during fueling, testing and maintenance procedures. Normal mounting is concrete/tarmac floor inset, threaded onto copper ground rod.

Heavy brass construction cup includes optional cover and receptacle's contact pin. Accommodates a wide variety of single-contact (copper on steel wire) static ground wire clamps in service.

Aerospace/industrial static ground devices

Cat. no.	Description
GCC1	Ground cup with cover*
GC1	Ground cup without cover*
F06146	Replacement contact tip**

* Hub is tapped for ¾"–10.
** Hub is tapped for ½"–13.

Computer system interconnections

Russellstoll® line selections for indoor and outdoor applications

DuraGard® to 4P4W 20 A through 60 A
The toughest construction in thermoplastic safety, durability and performance by design, in UL 94-VO flame-rated DuraV® material. With DurOring sealed pins, sleeves and interiors are watertight even unmated. 30 A and 50 A unique circuit breaker interlock line in DuraV are the best choices in all standard voltage polarization options through 600 V AC (interlock to 480 V AC).

Spec grade to 4P4W 20 A and 30 A
Otherwise similar to the DuraGard, spec grade refers to blue Lexan® plugs only made to the same original FS/FD™ design standards as DuraGard, in UL 94-5VA flame-rated material. Spec grade features DurOring sealed pins, and sleeves and interiors are watertight even unmated. Spec grade devices have been superceded by DuraGard ratings for OEM use.

FS/FD™ to 3P4W 15 A through 30 A
The original 15/20/30 A computer system connectors, the FS/FD line in aluminum continues in MRO usage. Many installations can also mate directly or convert to DuraGard® units. Our large installed base can be supported with any construction and product options. Convert to DuraGard® when possible.

Angle type to 3P4W 60 A use
The original 60 A main power computer system connector, angle type plugs are also available in specialty UL 94-V0 material (aluminum connectors). As part of the MRO usage 30–200 A angle type line, the 60 A connector is still commonly used today. Other lines such as Max-Gard should be used for changeout when possible.

Max-Gard® 30 A to 4P5W
For DP/computer system applications, a special Max-Gard polarization reflects DP installations. Special thermoplastic housing and back handle are supplied for these applications. Use wherever 4P5W installations are required.

Computer system interconnections

More than 30 years ago, Russellstoll® offered the first pin and sleeve connectors that met the demanding needs of the data processing industry, and we've been leading the way ever since.

The expanding technology of the computer system industry is creating more sophisticated applications, which require safe, reliable connections that exceed the tough demands of today's applications. Russellstoll's commitment to excellence offers you that and more... safety, durability, reliability and performance on our complete line of plugs, receptacles and connectors.

Pin and sleeve power connections are chosen for computer system interconnections because of the absolute performance required in today's mainframe and peripheral installation. Pin and sleeve connections have been proven to be more reliable in service than any bladed device. Data centers stay in service because Russellstoll keeps them connected.

Usage

- Any application where electrical connections must be protected from humidity, water, condensation and/or dust entering the wiring compartment and contacts
- Cable-to-connector sealing and device locking designs are critical
- Thermoplastic connectors preferred: some with aluminum conduit grounded shell
- Connection integrity needs are absolute; data center systems cannot go down
- Underfloor data center applications and wall-mount installations

Typical application groups

- Telephony equipment
- Switching rack systems
- Power distribution units
- Test and laboratory equipment
- Mainframes from 30–270 A
- Peripherals
- Data storage devices
- Military or critical power supplies

Computer system interconnections

Quick selection chart

Quick selection chart

Series*	FS/FD™ and angle type	Spec grade	DuraGard®
Available ranges (A)	20, 30 and 60*	20 and 30	20, 30, 50 and 60
Safety Grade™ UL® flame-rated high-temp thermoplastic	UL 94-V0 aluminum	UL94-5VA	UL94-V0
Easy-to-wire rear-loaded interiors	–	●	●
Single rated safety voltage polarizations	20 A		20 A
		20 A	30 A
		30 A	50 A
			60 A
Waterproof O-ring seal (pins, sleeves and interiors)	–	●	●
2nd internal ground lug (cable shielding alt.)	–	●	(optional)
External cable clamp	●	●	●
External gland nut lock	–	●	●

* 60 A devices are specially designed versions of Russellstoll angle type (7328DP).

E2630

LR14096

TüV For TüV listed devices, contact technical services.

Computer system interconnections

Plugs, connectors and receptacles

Plugs, connectors and receptacles

Poles/ wires	Amps	Voltage	Plug safety polarization	Std. cable bushing** (in.)	FS/FD™ aluminum•	Spec grade UL94-5VA	See bushing chart DuraGard® UL94-VO*
2P/3W	15/20	Up to 600 V AC/ 250 V DC		0.625	3720	3720DP (0.375)	9P23U0
				0.455		3720DP/0455	
				0.405		3720DP/0405	
		125 V AC		0.625	3720U1	3720DPU1 (0.375)	9P23U1
				0.455		3720DPU1/0455	
				0.405		3720DPU1/0405	
		250 V AC		0.625	3720U2	3720DPU2 (0.375)	9P23U2
				0.455		3720DPU2/0455	
				0.405		3720DPU2/0405	
	30	Up to 600 V AC		0.760	3750	3750DP	9P33U0
				0.700			
				0.625			
	50	Up to 600 V AC		1.000	–	–	9P53U0
				0.925			
				0.750			
	60	125 V AC		1.000	–	–	9P63U1
		250 V AC		1.000	–	–	9P63U2
3P/4W	20	Up to 600 V AC/ 250 V DC		0.688	3730	–	–
				0.625		3730DP/0625	9P24U0
				0.606		3730DP	–
	30	Up to 600 V AC		1.100	3760	3760DPG/1100	–
				1.000		3760PDG/1000	9P34U0◆
				0.875		3760PDG/0875	–
				0.760		3760DPG0760	–
	50	Up to 600 V AC 250 V DC		1.000	–	–	9P54U0
				0.925			
				0.750			
	60	125/250 V AC		1.000	–	–	9P64U1
		250 3Ø V AC		1.000	–	–	9P64U2
	60	Special angle type Up to 600 V AC		1.375	7328-78^	–	7328DP/1375
				1.188			–
				1.020			7328DP†
			Angle type	0.750			7328DP/0750
4P/5W	30	3øY 120/208 V AC	Max-Gard	0.775	–	–	DS3516MPDP+

Notes: All 20 A devices are compatible. 30 A FS/FD™ receptacles and connectors will accept all styles of mating plugs.
*For a more complete listing of UL 94-V0 rated devices, consult DuraGard information on pages 66–83.

** Consult your ABB representative for additional cable bushing sizes not listed.
† 7328 DP series thermoplastic can replace 7328 metallic.
• 30 A FS/FD™ aluminum plugs may not directly exchange with DuraGard plugs. FS/FD metal mating devices must be used.




FS/FD™ aluminum	DuraGard® UL94-VO*	FS/FD aluminum•	DuraGard UL94-VO*
3913	9C23U0	3743	9R23U0W▼
3913U1	9C23U1	3743U1	9R23U1W▼
3913U2	9C23U2	3743U2	9R23U2W▼
3933■	– 9C33U0■ –	3753■	9R33U0W▼■
–	9C53U0	–	9R53U0W●
–	9C63U1	–	9R63U1
–	9C63U2	–	9R63U2
3914	– 9C24U0 –	3744	9R24U0W▼
3934■	– 9C34U0◆■ – –	3754■	9R34U0W▼■
–	9C54U0	–	9R54U0W▼
–	9C64U1	–	9R64U1
–	9C64U2	–	9R64U2
7428-78^	–	–	SCF7324-78
DS3516FP+	–	DS3516FR+	–

Notes: All 20 A devices are compatible. 30 A FS/FD™ receptacles and connectors will accept all styles of mating plugs.
* For a more complete listing of UL 94-V0 rated devices, consult DuraGard® information on pages 66–83.
** Consult your ABB representative for additional cable bushing sizes not listed.
† 7328 DP series thermoplastic can replace 7328 metallic.
• 30 A FS/FD™ aluminum plugs may not directly exchange with DuraGard plugs. FS/FD metal mating devices must be used.
◆ Standard 0.750 bushing.
■ DuraGard receptacles and connectors 30/50 A will accept only DuraGard or Spec Grade. FS/FD Aluminum 30 A plugs must be used with FS/FD metal connectors or receptacles.
^ Angle type line
+ Max-Gard® line – for further information, see pages 6–47.
▼ Requires 3711A conduit FD box or 3781A DSFD box (50 A).

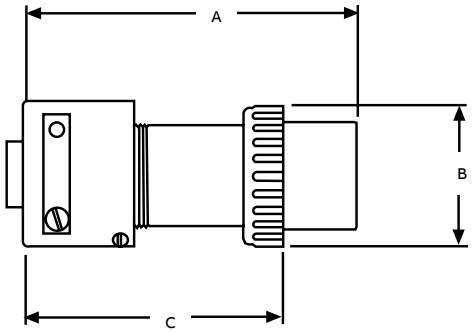
Computer system interconnections

Dimensions

Plugs

	Receptacle size (A)	A (in.)	B (in.)	C (in.)
FS/FD™	20	3 5/8	2	2 1/4
	30	3 3/4	2 1/4	2 3/8
Angle type DP (thermoplastic)	60	8	2 1/2	3 3/4
Spec grade DuraGard®	20	3 1/4	2 1/8	2 1/8
	30	5	2 3/8	3 5/8
	50	5 1/4	2 3/8	3 5/8

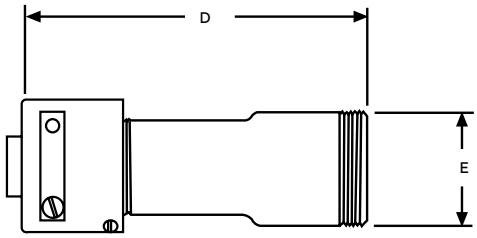
Dimensions



Connectors

	Receptacle size (A)	D (in.)	E (in.)
FS/FD	20	4	1 7/8
	30	4 5/8	2 1/8
Angle type (metallic)	60	9 1/8	3 1/2
Spec grade DuraGard	20	4 1/8	1 7/8
	30	5 5/8	2 1/8
	50	5 5/8	2 1/8

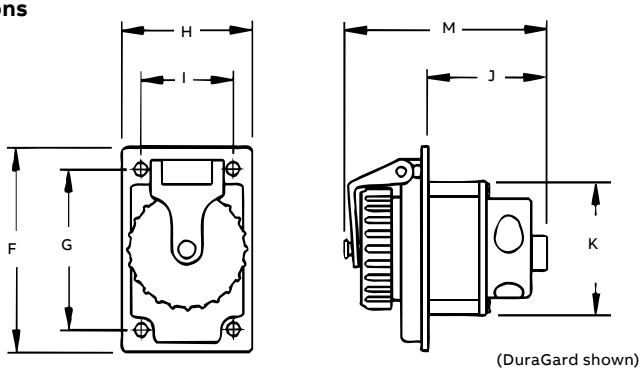
Dimensions



Receptacles

	Receptacle size (A)	F (in.)	G (in.)	H (in.)	I (in.)	J (in.)	K (in.)	M (in.)
FS/FD	20	4 1/8	3 1/4	2 5/8	1 7/8	1 1/8	2 1/4	2 1/2
	30	4 1/8	3 1/4	2 5/8	1 7/8	1 3/8	2 3/4	2 5/8
Angle YYPE (metallic)	60	3 1/2	2 7/8	3 1/2	2 7/8	–	2 1/2	6
DuraGard	20	4 1/8	3 1/4	2 5/8	1 7/8	1 1/2	2	3 1/8
	30	4 1/8	3 1/4	2 5/8	1 7/8	2 1/2	2 3/4	4 1/8
	50	4 1/8	3 1/4	2 5/8	1 7/8	2 1/2	2 3/4	4 1/8

Dimensions



(DuraGard shown)

Computer system interconnections

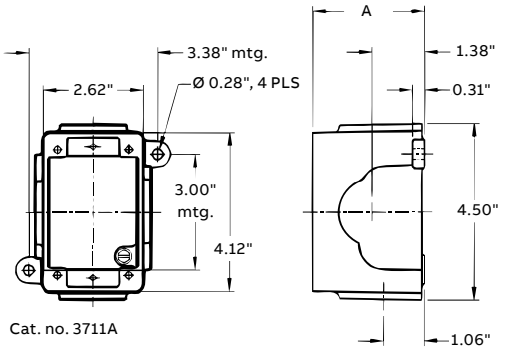
All conduit boxes/angle adapters are copper-free, cast aluminum, epoxy powder coat finish.

Conduit boxes (for surface mounting)

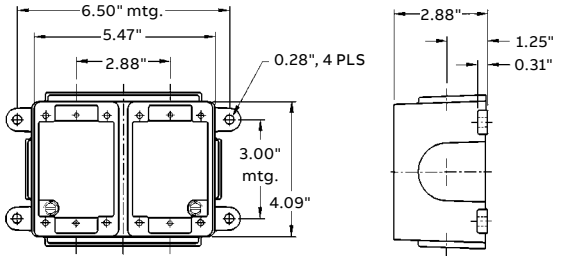
Receptacle size (A)	Cat. no. Single-gang	Cat. no. Double-gang
20, 30 and 50	3711A	3712A
60*	JB6-1	–
50	3781A	–

* Various mounting options available. 4" deep (not shown)

Dimensions



Cat. no. 3711A



Cat. no. 3712A

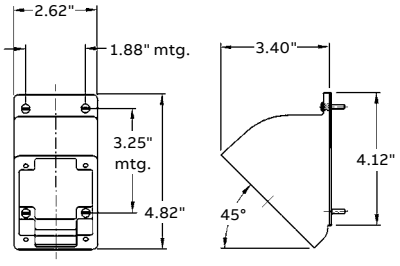
- Kit includes gland nuts for plugs or connectors.

Angle adapter

Receptacle size (A)	Cat. no. 45°	Cat. no. 20°
20, 30 and 50	3678A	–
60*	JAA6-45	JAA6-AB6

Mounts to conduit boxes to angle receptacle downward for easier access, no moisture retention on surfaces and better plug-cable drop bend relief.
* Various mounting options available.

Dimensions



Cat. no. 3678A

Conduit adapter

Plug/connector size (A)	Tapped hole size (in.)	Cat. no. FS/FD™	Cat. no. Spec grade	Cat. no. DuraGard®
20	½	FSA11	–	9X2C50
	¾	FSA12	–	9X2C75
	½	FSA21	–	9X3C50
30	¾	FSA22	–	9X3C75
	1	FSA23	–	–
50	¾	–	–	9X5C75
	1	–	–	9X5C10
	¾	JPA62	–	–
60 (angle type)	1	JPA63	–	–
	1¼	JPA64	–	–
	1½	JPA65	–	–

Computer system interconnections

Plug/connector replacement items

	Spec grade	DuraGard®	Spec grade		DuraGard®
Item color	Blue	Yellow	Blue	Yellow	Black
Plug/connector amperage (A)	20	20	30	30	50
Gland nut	C17077C	C17077A	C17076CX	C17076AX	C17076BX
Nylon locking screw	–	–	B16983	B16983	B16983
Bushing, clamp, nut and screw kit (Inc. nylon locking screw – 30/50 A)	B17019CPR	B17019APR	B17018CPR	B17018APR	B17018BPR
Bushings	To spec	To spec	To spec	To spec	To spec
Glide washer	863-8	863-8	500RS	500RS	500RS
Gland nut assembly	B17019CR	B17019AR	B17018CR	B17018AR	B17018BR

Note: Minimum purchase quantities apply.

Replacement interiors

Poles/ wires	Amps	Voltage polarization	Cat. no. Male interior assembly	Female interior assembly
–	–	125 V AC	9XM23U1	9XF23U1
2P3W	20	250 V AC	9XM23U2	9XF23U2
–	–	Through 600 V AC/250 V DC	9XM23U0	9XF23U0
2P3W	30	Through 600 V AC/250 V DC	9XM33U0	9XF33U0
2P3W	50	Through 600 V AC/250 V DC	9XM53U0	9XF53U0
3P4W	20	Through 600 V AC/250 V DC	9XM24U0	9XF24U0
3P4W	30	Through 600 V AC/250 V DC	9XM34U0	9XF34U0
3P4W	50	Through 600 V AC/250 V DC	9XM54U0	9XF54U0

Notes: For replacement bushings, see DuraGard® section, page 78.
Interiors with ground straps are specials.

Computer system interconnections

Performance – Electrical

Application	Performance
Dielectric voltage withstand	3000 V
Max. Working voltage	600 V RMS (minimum creepage distance and minimum clearance per UL 840)
Circuit interrupting/load breaking	UL listed and CSA certified for circuit interrupting at full rated current
Temperature rise	Max. 30 °C temperature rise at full rated current after 50 cycles of overload at 150% rated current at 0.75 pF
Shrouded contacts	Complies with California code title 8, art. 51, S2510.7(b) for devices exceeding 300 V AC
Horsepower	Per NEC® 430–151 ratings

Performance – Mechanical

Application	Performance
Impact resistance	Per UL 1682 Paragraph 34
Cord accommodation	Round portable service cords per UL standard 62 and CSA C22.2 No. 49.1
Terminal identification	In accordance with UL 1682
Cable pull-out force	In accordance with UL 1682
Product identification	Identification label and molded-in name
Lockout/tagout	Lockout/tagout hole in 30/50 A DuraGard® plug complies with OSHA Reg. 29 CFR 1910.147 (V0 30 A and 50 A plugs only)

Performance – Environmental

Application				Performance
Moisture resistance				Per UL 1682 paragraph 49. Watertight flap screw cover on receptacle, o-rings on all V0/5VA pins and sleeves (excludes 60A)
Flammability				V0/5A per UL 94 (DuraV® also 5VA in some applications)
Operating temperatures		**V0**	**5VA**	**Metal**
	Maximum	95 °C	130 °C	130 °C
	Continuous	(230 °F)	(266 °F)	(266 °F)
	Minimum	-40 °C	-29 °C	-40 °C
	Without impact	(-40 °F)	(-20 °F)	(-40 °F)
Chemicals				Resists standard industrial hydrocarbons, acids, bases and solvents (DuraV® and metal)

Approvals

Conforms to NEMA 4, 4X and 6 (DuraGard® and spec grade).

Contact technical services.

NEC and National Electrical Code are registered trademarks of the National Fire Protection Association, Inc.

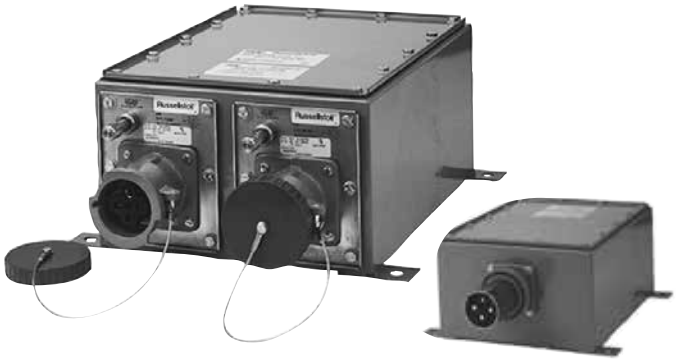
Materials

	FS/FD™	Spec grade	DuraGard® Safety Grade™
Contact carrier interior	Thermoset/thermoplastic) (20 A and 30 A)	Arc-resistant UL 94-V0 Phenolic thermoset	Arc-resistant UL 94-V0 Phenolic thermoset
Housing, gland nuts (in.)	Cast aluminum	Lexan® UL 94-5VA	DuraV® UL 94-V0
Screw collar rings	–	High-impact thermoplastic	High-impact thermoplastic
O-rings	–	Buna-N (Nitrile)	Buna-N (nitrile)
Contacts: pins and sleeves	Brass	Brass CDA 360	Brass CDA 360
Hinge pins (receptacle)	Stainless steel	–	Stainless steel
Terminals	Brass	Stainless steel	Stainless steel
All hardware	Stainless steel	Stainless steel	Stainless steel
Gland glide washer (or internal cable grip)	Brass	Nylon	20 A – Nylon 30 and 50 A – Aluminum
Cable clamp bushing	Neoprene	Neoprene	Neoprene

Lexan is a registered trademark of GE.

Computer system interconnections

Custom products



Interlocked branch distribution centers
Utilize an existing higher amperage service and split it into multiple lower-current service outlets. The outlets are individually interlocked with circuit breaker protection. Branch distribution centers are UL listed and CSA certified and can be configured for many inlet/outlet combinations.

Standard dual configuration
- 60 A male inlet
- 2–30 A individually interlocked female outlets, each circuit breaker protected
- Heavy-duty NEMA 4 welded, gasketed enclosure

Benefits
- **Saves rewiring costs** in a facility when installing small-sized, lower-current machines using existing electrical service
- **Quickest and most cost-effective** way to expand or reconfigure a single service with multiple service outlet combinations possible at every power drop
- **Safest way to operate:** UL listed 22 kA interrupt capacity interlocked circuit breaker protection for each branch outlet receptacle, in a NEMA 4 enclosure

Electrical and safety features
- One: 250 V AC, 3P4W, 60 A, male inlet feeding; Two: 250 V AC, 3P4W, 30 A, IEC 309-2 (9h Blue) female receptacle outlets, each protected by 22 kAIC circuit breaker; each mechanically interlocked
- Power is manually energized only after plug is inserted; externally visible trip indicator handles on each interlock
- Automatic shut off when plug is removed before contacts disengage; ground sleeves “make first, break last”
- “Trip-free” safety mechanism where outlets are not powered unless plug is inserted
- Full NEMA rated UL 489 listed 22 kA circuit breakers, available to 480 V at 30 A; 60 A and other options available

Applications
- **Data processing:** CPU/disk arrays/peripherals; new, smaller multiple units
- **Industrial/manufacturing lines:** reorganization, process reconfiguration
- **Portable power:** machinery, tools, test and diagnostic equipment

Mechanical and safety features
- All internal wiring is complete: a drop-in, plug-in specified device
- DP underfloor (horizontal) installation standard; vertical or other mounting conventions optional
- Electrostatic epoxy powder-coat gray finish over 14-gauge steel, NEMA 4 welded enclosure with gasketed access cover
- Screw cover protects outlet receptacles (flap cap option)
- Long-life stainless steel and nylon external hardware, copper-free aluminum castings, O-ring seals (to device spec) and brass electrical contacts

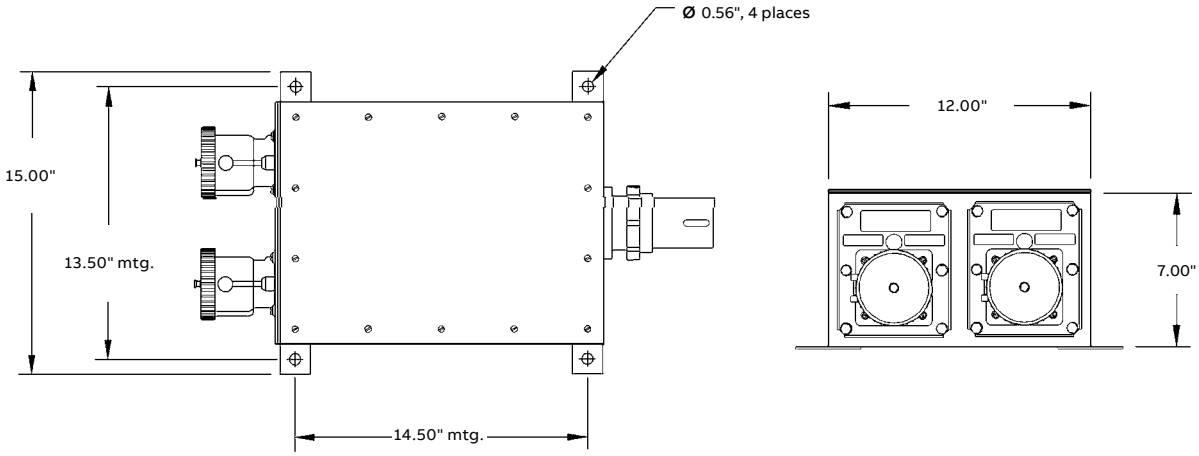
Custom products

	Inlet side		Outlet side*	
Cat. no.	250 V AC, 60 A Male inlet	Mating connector	250 V AC, 30 A Outlet receptacle	Mating plug
ER206M39	7528 Spl.	7428-78	RS430MM9W (x2)	RS430P9WV0

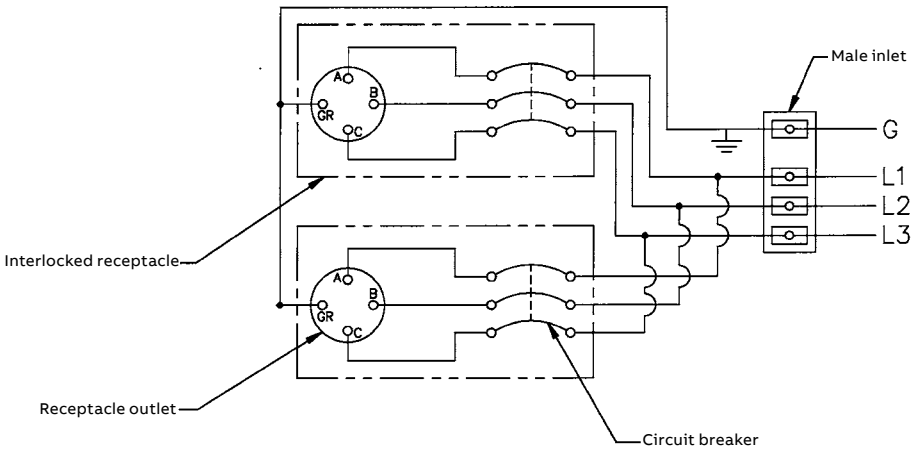
* IEC 309-2 configuration, 9h, 3P4W.
Notes: External mating plugs and connectors sold separately. Other configurations available. Consult factory or your ABB representative.

Computer system interconnections

Outline dimensions



Schematic diagram



Mipco™ connections for refrigerated containers

Plug into Mipco power

Mipco plugs, connectors and receptacles are used extensively in ports, terminals, transport and shipboard applications to provide a safe, watertight electrical connection for refrigerated containers. Mipco construction and design benefits are a quality benchmark:

- **No corrosion:** Aluminum receptacles are copper-free aluminum castings with a unique two-layer electrostatic epoxy powder-coat finish. Stainless steel and brass components are used extensively.
- **Tougher and better:** Thermoplastic receptacle, connectors and plugs are made from AMTUF™ high-abuse nylon thermoplastic and DuraV® high-strength thermoplastic. Wide range chemical, UV withstand, impact and overall performance characteristics set the standard for construction.
- **Safety listed and approved:** We lead with safety in UL/CSA listings, approvals and certifications. “Recognized” or “non-listed” offshore supplier components just aren’t the same.

The Mipco™ advantage

Safety

- Safety ground pin “makes first,” “breaks last” for optimum operator safety
- Internal O-ring seals provide watertight integrity, even without plug engaged or cap in place
- Thermoset interiors provide the safest insulation under extreme conditions
- Color-coded housings provide easy identification of mating components

Durability

- AMTUF housings provide three times the impact and temperature resistance of polycarbonate; extremely resistant to oil, fuel, grease and most common solvents
- Neoprene cable compression bushings with locking collars provide a watertight, tug-proof connection

Reliability

- Solid brass contact sleeves with beryllium copper compression springs minimize heat rise and corrosion
- Waterproof cable sealings and locking screw collars ensure waterproof connections

Easy installation & service

- Fast assembly and wiring with “drop-in” rear-loaded interiors
- A variety of optional bushing sizes available for plugs and connectors to ensure sealing to your cable
- Readily available service parts:
  - Interior assemblies
  - Gland nut assemblies
  - Screw collars
  - Flap cap/screw cap assemblies

Mipco™ connections for refrigerated containers

Waterproof cable sealing:
- Nut with cable locking clamps
- Neoprene compression bushing cable sealing/ locking system

Fast, easy, rear-load wiring and assembly:
- Terminal set screws

The most durable materials available
- AMTUF™ high-impact housings
- Thermoset interiors

Waterproof locking connections:
- Locking screw collars with gasket seals
- IP67 minimum

Dry wiring compartments
- Interior o-ring seals around compartments, and each pin and sleeve ensure true "waterproof connections"

333MPXT and 333FCV shown

Dry wiring compartments
- Interior O-ring seals around compartments, and each pin and sleeve ensure waterproof connections

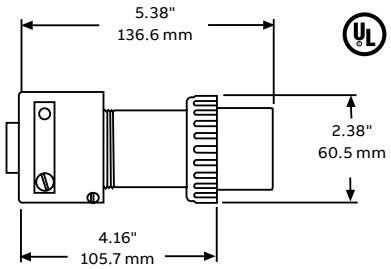
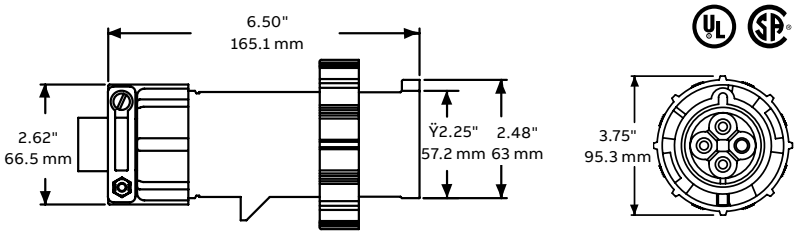
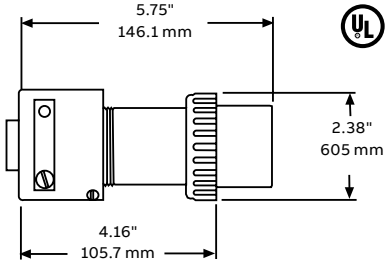
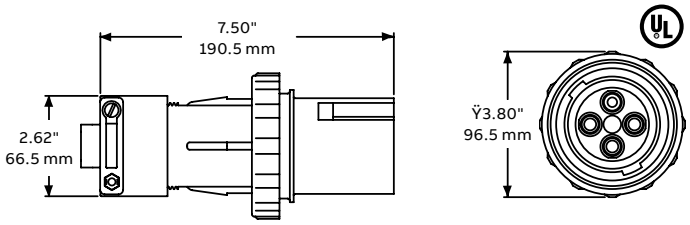
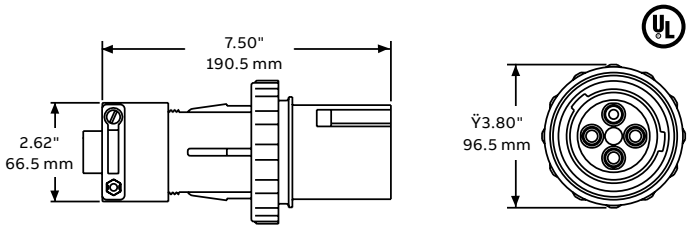
High reliability, high-performance connections
- CDA 360 solid brass pin and sleeve
- Ground contacts "make first," "break last"

Long-lasting, self-cleaning connections
- Full round pin and sleeve contacts for maximum contact area and coolest connection

Mipco™ connections for refrigerated containers

Plugs

Male plugs

Cat. no.		Dimensions	Rating
334MPXT			**30 A** **250 V AC** 60 Hz 3P4W
333MPXT ★			**32 A** **380/440 V AC** 50/60 Hz 3P4W IEC 309-2 480 V AC USA
534MPXT			**50 A** **250 V AC** 60 Hz 3P4W
634MP2XT			**60 A** **250 V AC** 60 Hz 3P4W
634MP4XT			**60 A** **480 V AC** 60 Hz 3P4W

Additional bushing sizes available for plugs and connectors to ensure sealing to your cable. See page 182 for ordering information.

• Polycarbonate housing.

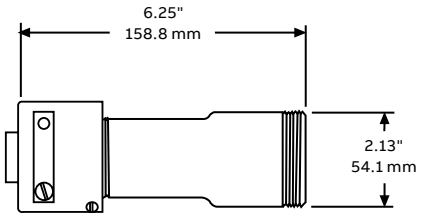
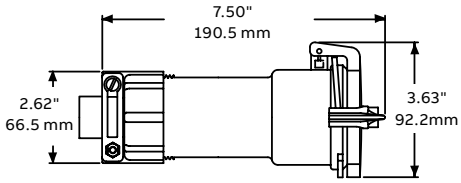
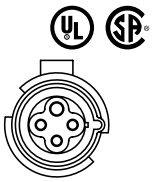
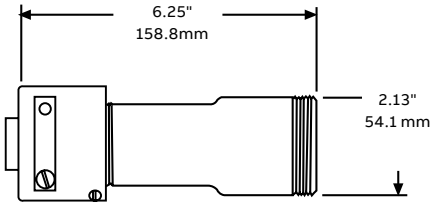
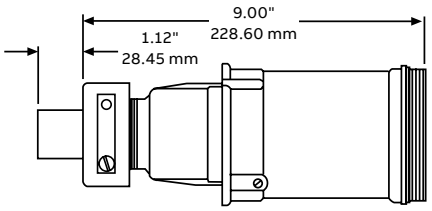
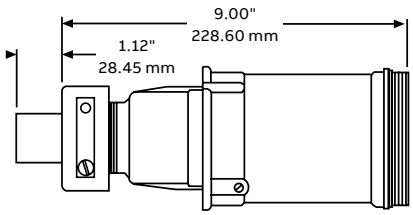
▲ DuraV® housing, UL94V-0 flame rated.

★ AMTUF® housing.

Mipco™ connections for refrigerated containers

Connectors

Female connectors

Cat. no.	Dimensions	Rating
334FC • 		**30 A** **250 V AC** 60 Hz 3P4W
333FCV ▲ (DuraV® housing) 	  Snap cap is not shown in this view	**32 A** **380/440 V AC** 50/60 Hz 3P4W IEC 309-2 480 V AC USA
534FC • 		**50 A** **250 V AC** 60 Hz 3P4W
634FC2 • 		**60 A** **250 V AC** 60 Hz 3P4W
634FC4V ▲ (DuraV housing) 		**60 A** **480 V AC** 60 Hz 3P4W

Additional bushing sizes available for plugs and connectors to ensure sealing to your cable. See page 182 for ordering information.

• Polycarbonate housing.

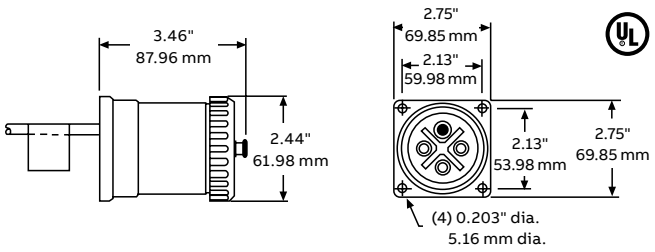
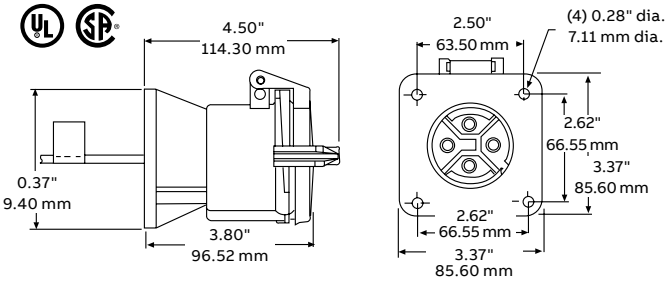
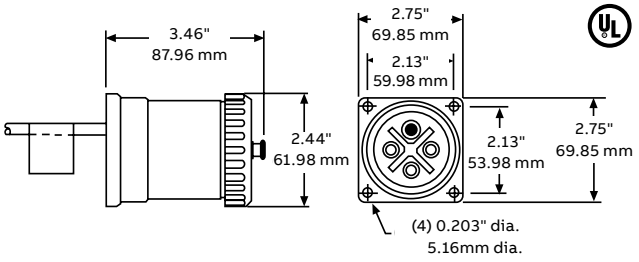
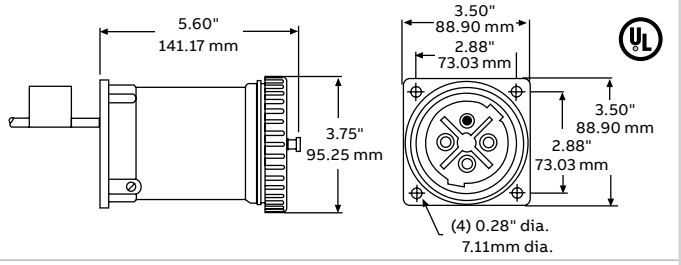
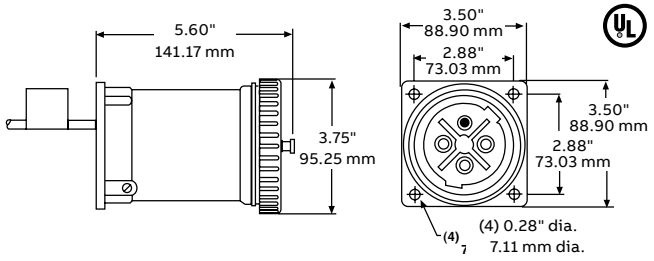
▲ DuraV® housing, UL94V-0 flame rated.

★ AMTUF® housing.

Mipco™ connections for refrigerated containers

Receptacles

Non-metallic female receptacles

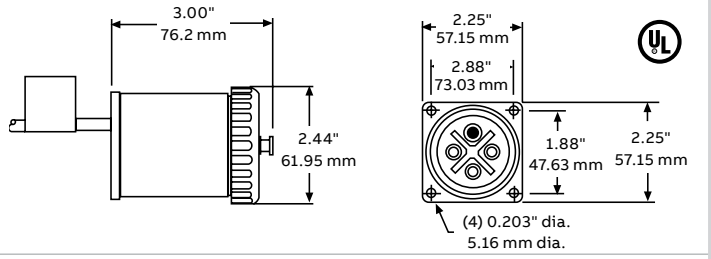
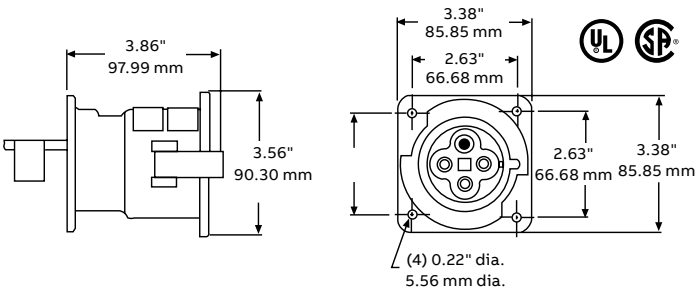
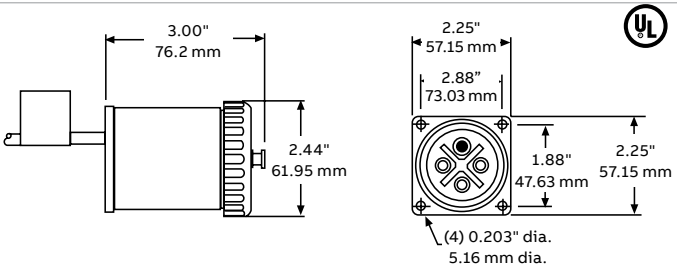
Cat. no.	Dimensions	Rating
3034FRXTS		**30 A** **250 V AC** 60 Hz 3P4W
3334FRVS ▲ 		**32 A** **380/440 V AC** 50/60 Hz 3P4W IEC 309-2 480 V AC USA
5034FRXTS ★		**50 A** **250 V AC** 60 Hz 3P4W
6234FRXTS ★ 		**60 A** **250 V AC** 60 Hz 3P4W
6434FRXTS ★ 		**60 A** **480 V AC** 60 Hz 3P4W

For all Receptacles – Flap cap, order using suffix "F". Example 3334FRVF.
Screw cap, order using suffix "S". Example 3034FRXTS.
Additional bushing sizes available for plugs and connectors to ensure sealing to your cable. See page 182 for ordering information.
• Polycarbonate housing.
▲ DuraV® housing, UL94V-0 flame rated.
★ AMTUF® housing.

Mipco™ connections for refrigerated containers

Receptacles

Metallic female receptacles

Cat. no.		Dimensions	Rating
3034FRS			**30 A** **250 V AC** 60 Hz 3P4W
3334FRF 			**32 A** **380/440 V AC** 50/60 Hz 3P4W IEC 309-2 480 V AC USA
5034FRS			**50 A** **250 V AC** 60 Hz 3P4W

For all Receptacles – Flap cap, order using suffix "F". Example 3334FRVF.
Screw cap, order using suffix "S". Example 3034FRXTS.
Additional bushing sizes available for plugs and connectors to ensure sealing to your cable. See page 182 for ordering information.
• Polycarbonate housing.
▲ DuraV® housing, UL94V-0 flame rated.
★ AMTUF® housing.

Mipco™ connections for refrigerated containers

Accessories

Accessories for plugs and connectors

Additional bushing sizes

Cat. no.	Washer & bushing I.D. (in.)
B16779AR	0.750
B16779BR	0.875
B16779CR	0.620
B16779DR	0.700
B16779ER	1.000
B16779FR	0.800
B16779GR	0.545
B16779HR	0.925

For 30, 32, 50 and 60 A standard devices.

Accessories for non-metallic receptacles[1]

Junction box and straight adapter[2]

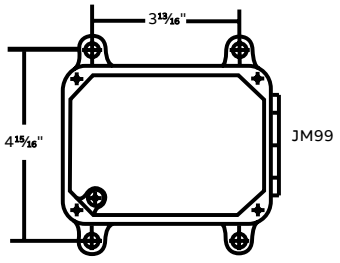
Straight adapter and junction box shown assembled.

Straight adapter cat. no.	Junction box cat. no.	Receptacle rating
SAM50	JM99	30 A, 250 V
SAM32	JM99	32 A, 380/440 V (480 V)
SAM50	JM99	50 A, 250 V
SAM60	JM99	60 A, 250 V
SAM60	JM99	60 A, 480 V

Junction box and straight adapter

Angle adapter and junction box shown assembled.

Straight adapter cat. no.	Junction box cat. no.	Receptacle rating
AM50	JM99	30 A, 250 V
AM32	JM99	32A, 380/440 V (480 V)
AM50	JM99	50 A, 250 V
AM60	JM99	60 A, 250 V
AM60	JM99	60 A, 480 V



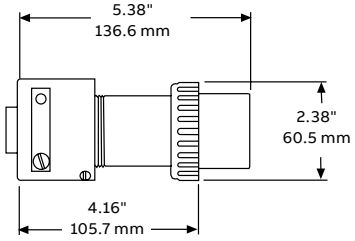
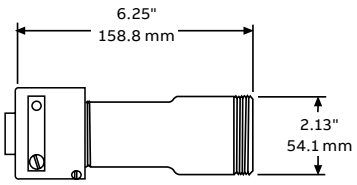
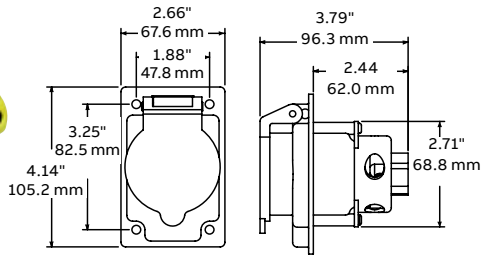
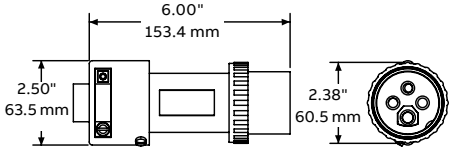
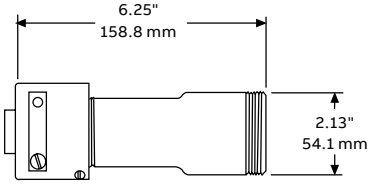
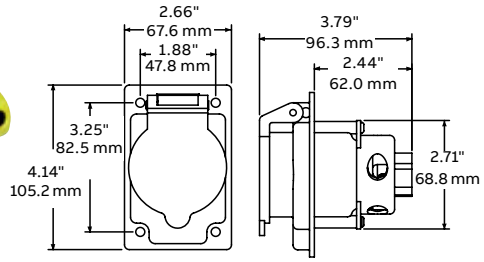
Notes:
1. Does not exclude 32 A metallic receptacles.
2. Adapter and junction box may differ from photo.

Mipco™ connections for refrigerated containers

Reversed contacts service – 30 A and 50 A, 250 VAC

Female plugs

Male connectors and receptacles

Cat. no.	Dimensions	Rating	Cat. no.	Dimensions
334FP• 		**30 A 250 V AC,** 60 Hz 3P4W	334MC ▲ 	
		30 A 250 V AC, 60 Hz 3P4W	334MR ▲ 	
534FP• 		**50 A 250 V AC,** 60 Hz 3P4W	534MC ▲ 	
		50 A 250 V AC, 60 Hz 3P4W	534MR ▲ 	

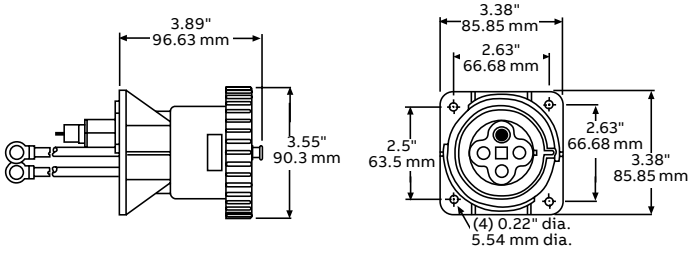
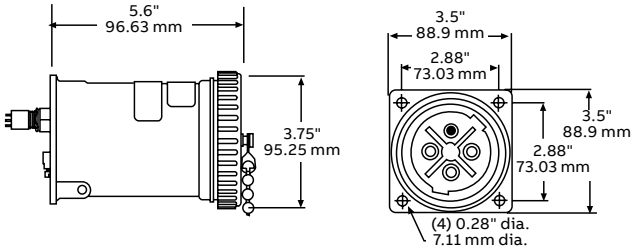
Note: Many additional bushing sizes available; see page 182.
• Polycarbonate housing.
▲ DuraV® housing, UL94V-0 flame rated.
★ AMTUF® housing

Mipco™ connections for refrigerated containers

Fixed receptacles with monitor switches

These receptacles include a micro switch mounted at the rear of the interior. The switch is mechanically activated by plug (ground pin) insertion. Applications include electrical interlocking, control circuits and safe switch or monitor systems. (Micro switch is a separate circuit.)

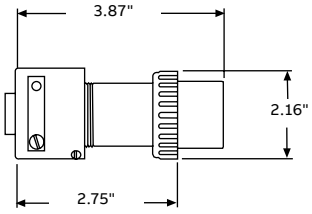
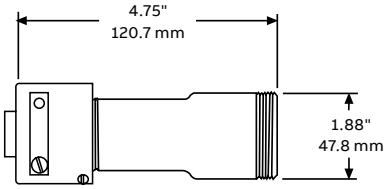
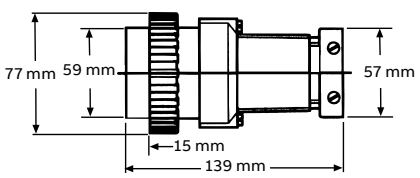
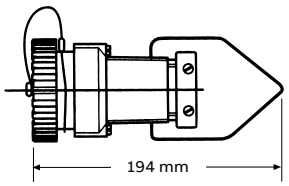
Fixed receptacles with monitor switches

Cat. no.		Dimensions	Rating
3334FRVSMS▲*			**32 A 380/440 V AC** 50/60 Hz, 3P4W IEC309-2 480 V AC USA
6234FRMS★*			**60 A 250 V AC** 60 Hz 3P4W

* Flap cap also available.
• Polycarbonate housing used on 6234FRMS.
▲ DuraV® housing used for 3334FRVSMS; replaces 3334FRPSMS.
★ AMTUF® housing.

Special rated plugs and connectors

20 A and Australian

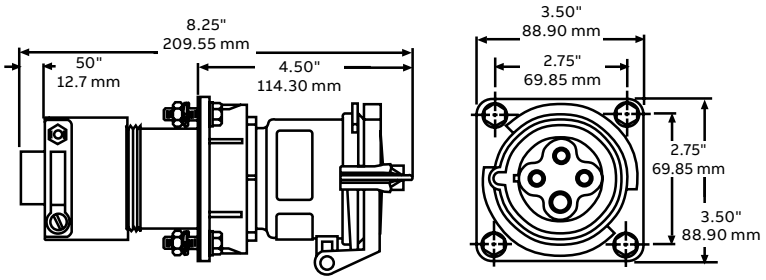
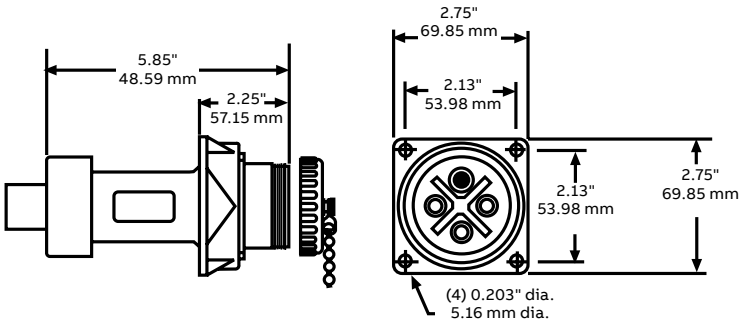
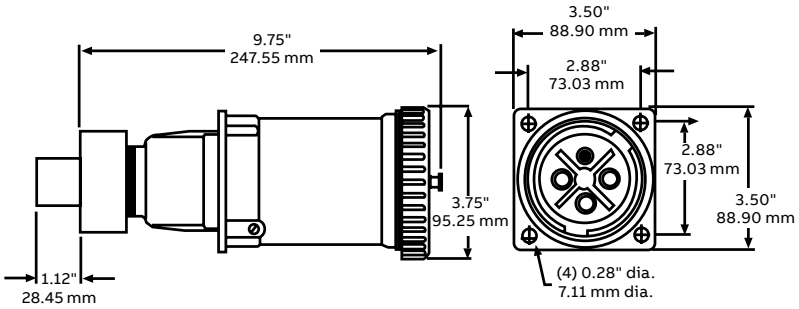
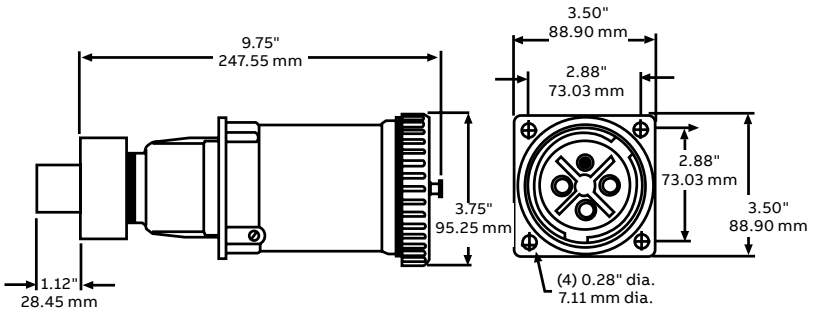
Cat. no.	Dimensions	Rating	Cat. no.	Dimensions
Male plugs			**Female connectors**	
223MP2	 	**20 A 250 V AC,** 60 Hz 2P3W	223FC2	 
334MP5	 	**32 A Australian standard 440/500 V AC,** 50 Hz 3P4W	334FC5	 

Mipco™ connections for refrigerated containers

Flanged connectors

Flanged connectors are used in many trailer-mount or underslung applications where connector needs to be mounted through a bulkhead plate or other fixed position.

Flanged connectors

Cat. no.	Dimensions	Rating
333FCVF▲ 		**32 A, 380–440 V AC** 50/60 Hz, 3P4W IEC 309-2 (480) V AC-USA)
534FCF▲ 		**50 A, 250 V AC** 60 Hz, 3P4W
634FC2FXT★ 		**60 A, 250 V AC** 60 Hz, 3P4W
634FC4FXTS/0750★ 		**60 A, 480 V AC** 60 Hz, 3P4W

* Polycarbonate housing.

▲ DuraV® housing, UL94V-0 flame rated.

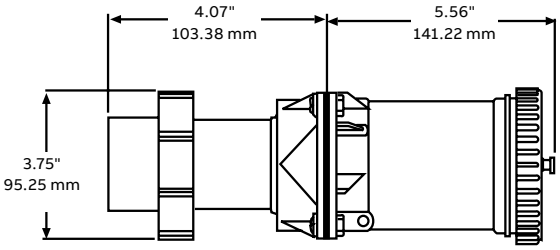
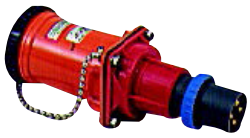
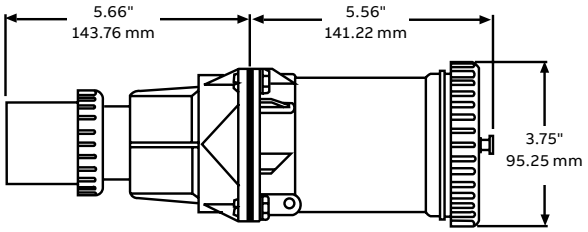
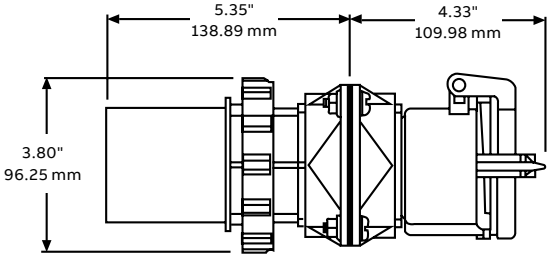
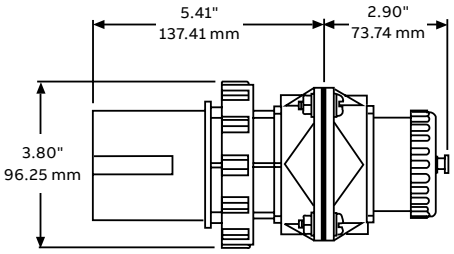
★ AMTUF® housing.

Mipco™ connections for refrigerated containers

Converter plugs

Converter plugs and converter cords facilitate the connection of a plug and receptacle with different ratings. Vessel sharing has become increasingly common, resulting in refrigerated containers with plug configurations that do not match the existing shipboard or port terminal receptacles. The converter plug eliminates the need for time-consuming and expensive temporary changeovers when these situations are encountered.

Converter plugs

Cat. no.	Dimensions	Rating
3260CPV▲  **32 A** **380/440 V** Male plug		**60 A** **480 V AC** Female connector
5060CP  **50 A** **250 V AC** Male plug		**60 A** **250 V AC** Female connector
6032CP▲  **60 A** **250 V AC** Male plug		**32 A** **380/440 V AC** Female connector
6050CP  **60 A** **250 V AC** Male plug		**50 A** **250 V AC** Female connector

▲ DuraV® housings.

Converter cord sets

Converter cord sets are also available using a Mipco plug and connector, with two feet (0.6 meters) of suitably rated, four-conductor cable.

They are available with any plug/connector combination of the same voltage. Contact Technical Services to specify.

Mipco™ connections for refrigerated containers

Performance, material and approvals

Performance – Electrical

Application	Performance
Dielectric voltage withstand	3000 V
Max. working voltage	Minimum creepage distance and Minimum clearance per UL 840
Temperature rise	Max. 30 °C temperature rise at full rated current after 50 cycles of overload at 150% rated current at 75 pf

Performance – Mechanical

Application	Performance
Impact resistance	Per UL 1682 paragraph 34
Cord accommodation	Round portable service cords. 10 standard diameters from 0.405" to 1.00", custom sizes to spec
Terminal identification	In accordance with UL 1682
Cable pull-out force	In accordance with UL 1682
Product identification	Identification label or molded in name

Performance – Environmental

Application	Performance
Moisture resistance	Per UL1682 paragraph 49. Watertight/flap screw cover on receptacle, O-rings on all pins and sleeves, interiors and plug shell. Watertight even when not engaged
Flammability	HB or better per UL 94 (housing) V0 or better per UL 94 (interior)
Operating Temperatures	Maximum continuous: 95 °C/203 °F Minimum: -29 °C/-20 °F w/o impact (polycarbonate) -40 °C/-40 °F w/o impact (AMTUF™ and DuraV®)
Chemicals	Resists standard industrial hydrocarbons, acids, bases and solvents

Material

Part	Material
Contact carrier interior	Molded arc-resistant UL94-V0 thermoset
Housing, gland nuts, screw collar rings	Polycarbonate, high-impact thermoplastic
O-rings	Buna-N (nitrile)
Contacts: pins and sleeves	Brass CDA 360
Hinge pins (receptacle)	Stainless steel
Terminals	Brass CDA 360
Terminal screws, flap springs, assembly screws, nuts, hardware	Stainless steel or brass
Bushing glide washer	20 A – Nylon 30, 50 & 60 A – Aluminum
Cable clamp bushing	Neoprene or Santoprene

Approvals

Meets requirements for NEMA 4, 4X, & IP 67.
UL listed and CSA certified.

• E2630/E47956 • LR14096

Mipco™ connections for refrigerated containers

Mipco advantage

M433-30F22

M464-30S22

No one does It like Mipco
Mipco interlocked reefer power outlets are used extensively in port terminals and shipboard applications to provide a safe, watertight electrical connection for refrigerated containers. They feature a heavy-duty, interlocked UL/CSA listed and circuit breaker-protected electrical power outlet. This ensures the outlet cannot be switched "live" until a plug is fully engaged and the actuator rod is pushed to the "on" position. Pulling the actuator rod to the "off" position manually de-energizes the circuit. The circuit de-energizes automatically if the plug is accidentally withdrawn while in the "on" position. Also, the interlock mechanism "breaks" the circuit while the pin and sleeve contacts are still engaged. This provides total operator safety and protection against shock hazard while eliminating arcing damage to the plug and receptacle.

The modular design pioneered by Mipco allows for quick, easy installation and maintenance. Mipco engineers designed the interlocked reefer power outlet for the utmost safety, durability and reliability.

The Mipco™ advantage

Safety
- Interlock mechanism protects against shock hazard and cannot be overridden like other designs
- Plug cannot be inserted or withdrawn under load; ground pin activates interlock
- Thermoset interiors provide the safest insulation under extreme conditions
- UL 489 listed circuit breaker for optimum operator and circuit protection
- Non-conductive knob is oversize for safe, easy operation

Durability
- Heavy-duty ½" diameter stainless steel actuator rod offers superior resistance to corrosion and abuse
- UL 489 listed circuit breaker is resettable after circuit interruption
- Heavy-gauge stainless steel platform and aluminum receptacle housing resists corrosion and physical damage
- O-ring sealed insulator, contact sleeves, ground pin, interlock actuating pin and actuator rod ensure watertight integrity of wiring compartment when screw cover or plug is removed

Reliability
- Segmented solid brass contact sleeves with beryllium copper compression springs minimize heat rise and corrosion
- UL 489 listed circuit breaker provides branch circuit protection per NEC®

Easy installation and service
- Mipco's "modular design" makes installation and maintenance fast and inexpensive with easy accessibility to individual parts
- 4-screw, 3-wire receptacle service
- One-piece interlock mechanism requires no adjustment and simplifies maintenance
- Complete line of service parts readily available:
  - Receptacle assembly
  - Circuit breaker assembly
  - Interior assembly
  - Linkage kits
  - Hardware kits
  - Flap cap/screw cap assemblies

Mipco™ connections for refrigerated containers

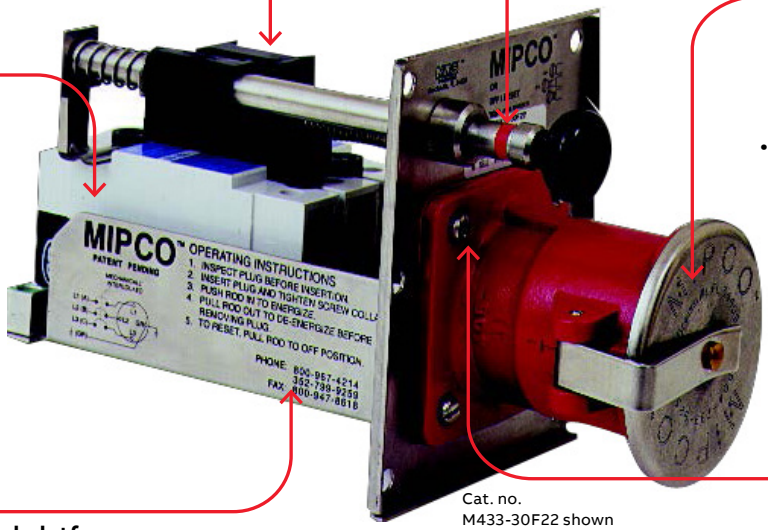
22 kAIC, 480 V interlocked reefer power outlet

The compact frame choice with nominal inrush current protection.

Mechanical interlock mechanism
- Protects against shock hazard
- Eliminates arcing damage
- Automatically de-energizes the circuit upon plug withdrawal; even if actuating rod is jammed in the on position

UL 489 listed and CSA certified 22 kAIC circuit breaker
- Maximum operator and circuit protection
- Branch circuit protection per NEC®

Heavy-gauge stainless steel platform
- Maximum durability from user abuse
- Corrosion resistant



Cat. no.
M433-30F22 shown

Heavy-duty actuating rod
- Superior durability
- Located away from the receptacle for maximum operator safety
- Withstands user abuse

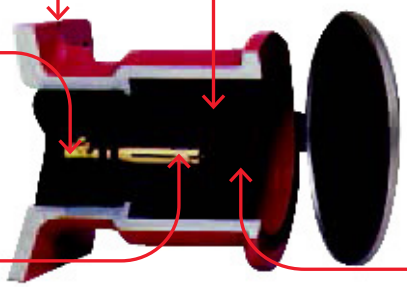
Stainless steel self-aligning flap cap
- Ensures a positive environmental seal
- Maximum corrosion resistance
- Withstands user abuse

Receptacle mounting design
- Easy installation and service (four stainless steel screws, three wires)

Metallic receptacle housing
- Withstands physical abuse
- Corrosion resistant

O-ring sealed interiors and sleeves
- Seals wiring compartment from environment
- Eliminates accidents and burnouts

Segmented contact sleeves with compression springs
- Consistent contact pressure
- Minimizes heat rise and corrosion
- Self-cleaning pins and sleeves for longer life



Ground pin actuates interlocking mechanism
- Ensures grounding integrity with ground pin
- Receptacle is de-energized upon plug removal; when plug is reinserted, switch can be operated

Thermoset interiors
- Resist high heat and arcs

Mipco™ connections for refrigerated containers

Interlocks with metallic receptacle housings

M432-30S22

M433-30F22

M452-50S22

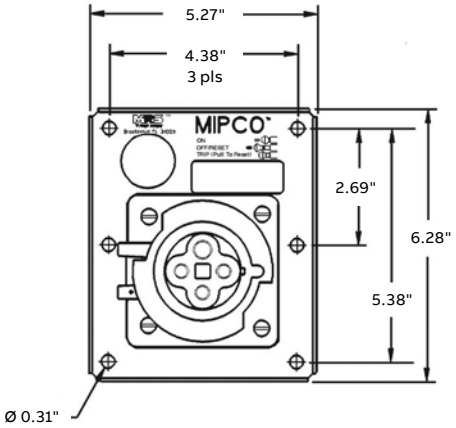
M464-30S22

Interlocks with metallic receptacle housings

Cat. no.						Mating plug
Flap cap	Screw cap	Amps	Voltage ratings	Poles, wires	Trip rating amps†	Cat. no.*
M432-30F22	M432-30S22	30	250 V, 60 Hz	3P4W	30	334MPXT
M433-30F22	M433-30S22	32	380/440 V 50/60 Hz[1]	3P4W	30	333MPXT
M452-50F22	M452-50S22	50	250 V, 60 Hz	3P4W	50	534MPXT
M462-50F22	M462-50S22	60	250 V, 60 Hz	3P4W	50	634MP2XT
M464-60F22	M464-60S22	60	480 V, 60 Hz	3P4W	60	634MP4XT

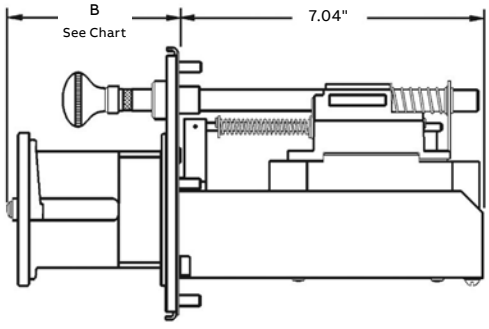
*Mating plugs are sold separately.
†Other trip ratings available upon request.
1480 V AC/60 Hz US common rating.

Dimensions



Amperage (A)	B (in.)
30 & 50	3.23
32	4.00
60	5.10

Dimensions

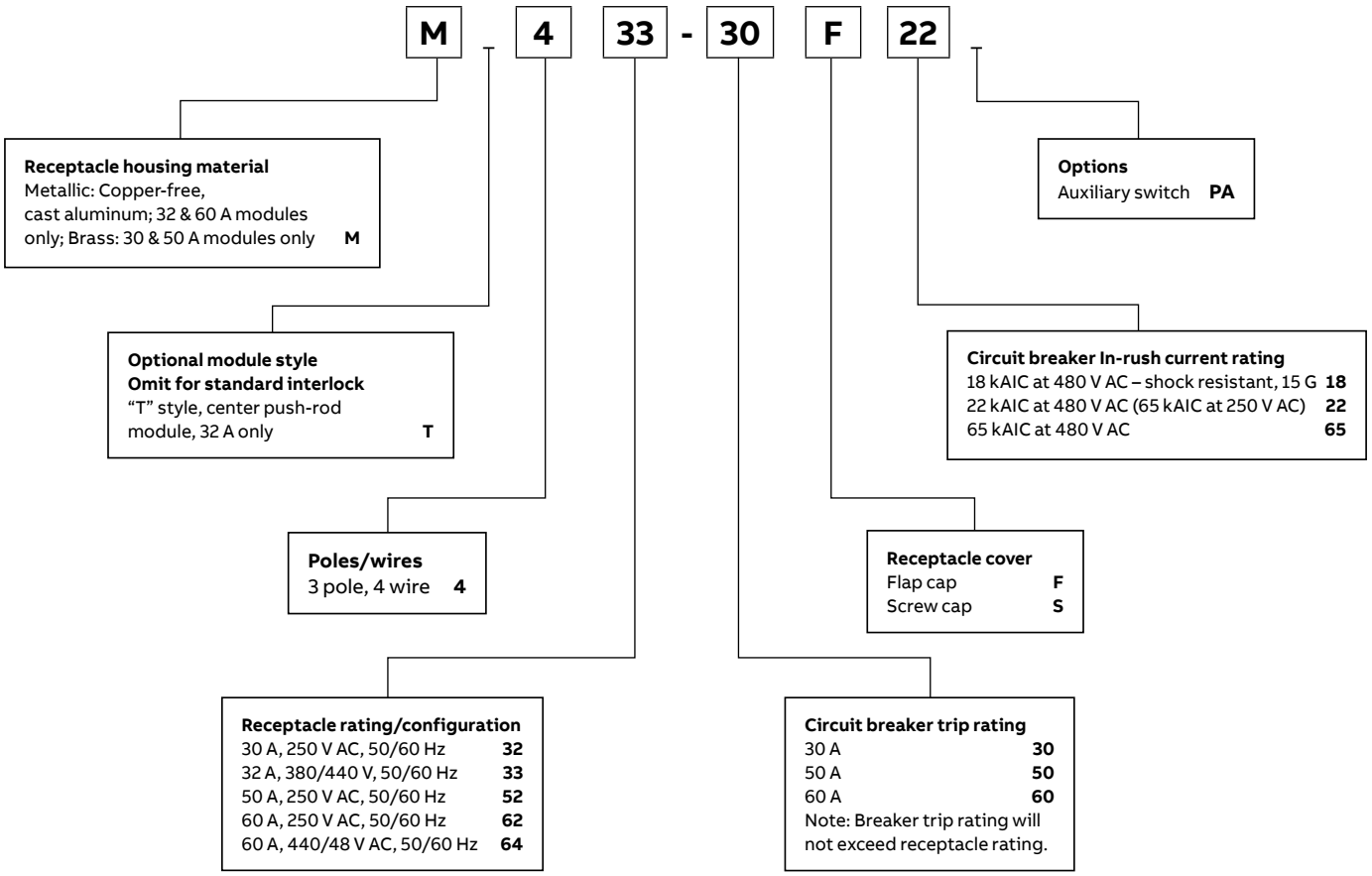


Mipco™ connections for refrigerated containers

Catalog number construction guide

Mipco interlocked reefer power outlet catalog numbers are easily specified using the guide below. Options include auxiliary switch construction.

☐ Indicates field that must be filled in to complete order. Note: Availability of selected configuration will be verified at quotation time.



Mipco™ connections for refrigerated containers

Interlocks complete with single-gang cast aluminum closure

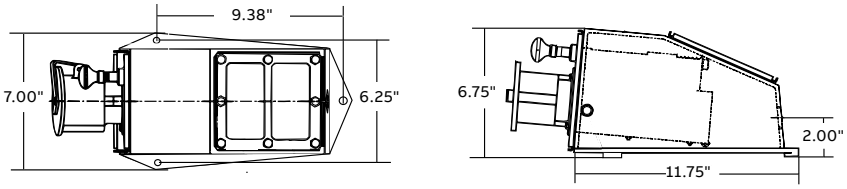
1BM432-30F22

Interlocks complete with single-gang cast aluminum closure

Cat. no.						
Flap cap	Screw cap	Amps	Voltage ratings	Poles, wires	Trip rating amps	Mating plug Cat. no.*
1BM432-30F22	1BM432-30S22	30	250 V, 60 Hz	3P4W	30	334MPXT
1BM433-30F22	1BM433-30S22	32	380/440 V 50/60 Hz[1]	3P4W	30	333MPXT
1BM452-30F22	1BM452-30S22	50	250 V, 60 Hz	3P4W	50	534MP2XT
1BM462-30F22	1BM462-30F22	60	250 V, 60 Hz	3P4W	60	634MP4XT
1BM464-30F22	1BM464-30S22	60	480 V, 60 Hz	3P4W	60	634MPXT

* Mating plugs are sold separately.
[1] 480 V AC/60 Hz US common rating.

Dimensions



Mipco™ connections for refrigerated containers

Special rotary switch interlocks

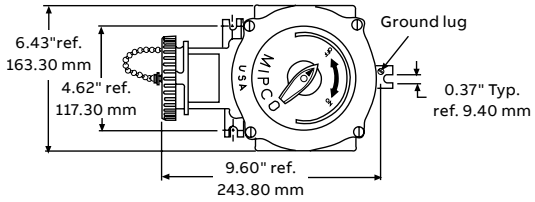
SR33341B

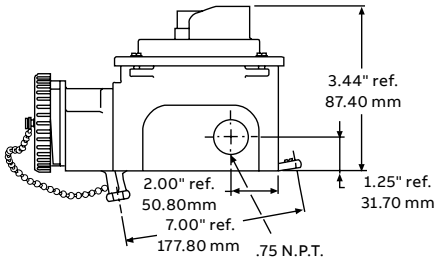
Cast aluminum (or brass) switched interlocked used for trailer, rail and common-feed shipboard applications. Circuit protection normally is upstream of load.

Special rotary switch interlocks

Cat. no.	Rating
SR33341B	32 A, 380–440 V AC 50/60 Hz, 3P4W IEC309-2, 3h 480 V AC USA

Dimensions





Accessories

Single-gang enclosures – Copper-free cast aluminum for maximum corrosion resistance and durability, these can be ordered separately or complete with interlocked outlet by using a “1B" prefix with any interlocked outlet catalog number.
Wedge gaskets – Molded neoprene wedge gaskets provide drainage 4° down angle for interlocked outlets; easily installed behind front plate.
Large-frame adapter plate kit – Stainless steel adapter plate kit allows small-frame 6-bolt interlocked outlets to replace large-frame 8-bolt outlets. Kit bolts to existing 8-bolt enclosure opening.

			Cat. no.
Outlet frame size	Single enclosure	Wedge gasket kit	8-bolt adapter kit
Small frame, 6-bolt	1255-01R	980-50R	523R

Mipco™ connections for refrigerated containers

Performance, materials and approvals

Performance – Electrical

Application	Performance
Dielectric voltage withstand	3000 V
Max. working voltage	480 V AC
Circuit protection	UL 489 listed, CSA certified circuit breaker
Fla interrupting capacity	Specified breaker rating
Short circuit withstand rating	22,000 AIC or 18,000 AIC (shock resistant)
Operations	>10,000 cycles at rated current

Performance – Mechanical

Application	Performance
Mounting	(6) 5⁄16" diameter through holes
Breaker terminals	Pressure screw lugs (slotted) accept #14–1/0 AWG wire
Terminal identification	In accordance with UL489 and UL1682 A, B, C, G (earth ground) on line side
Product identification	External label on face plate
Operations	>25,000 cycles of operation

Performance – Environmental

Application	Performance
Moisture	Watertight screw cover or spring-loaded self-aligning flap cap. O-rings on all sleeves, interior, interlock actuating pin and circuit breaker actuator rod bushings. Gasket on receptacle and module flange
Operating temperatures	Min. continuous -20 °F (non-enclosed) Max. continuous +140 °F
Chemicals	Resists common industrial hydrocarbons, acids, bases and solvents
UV resistance	Polyurethane enamel (32 A) and natural metallic finishes provide maximum UV protection

Materials

Part	Material
Receptacle housing metallic	30 A/50 A – Brass (natural) 32 A – Copper-free aluminum 356-T6 (red epoxy powder coated) 60 A – Copper-free aluminum 356-T6 (natural)
Non-metallic	30 A/50 A & 60 A – AMTUF™ 32 A – DuraV®
Interior	Molded arc-resistant thermoset phenolic (UL 94-V0 flame rating)
Contact sleeves	Brass with beryllium copper compression springs
Terminal screws	Brass, slotted
O-rings	Buna-N (nitrile)
Gaskets	Neoprene
Mounting platform	Heavy-gauge stainless steel welded construction
Actuator rod	½"-inch diameter solid stainless steel. Heavy-duty non-conductive impact-resistant plastic knob
Ground lug	Aluminum terminal screw (slotted) accepts up to #2 AWG wire
Interlock mechanism	Sealed self-lubricating thermoplastic
Flap cap	12-gauge stainless steel, gasketed cover
Screw cap	High-impact plastic, gasketed
Washers	Nylon
Springs, fasteners	Stainless steel

Approvals

Underwriters Laboratory (UL) – Sections 489, 1682 and 1686
CSA Section – C22.2–182.1
Federal Department of Transportation – Federal register volume 47, number 68, subpart 11.79 **United States Coast Guard (USCG)**
International Electro-Technical Commission (IEC) – 32-amp devices conform to IEC 309-1 and 309-2
International Standards Organization (ISO) – ISO 1496/2, Annex 1

• E47955 • LR96445

Mipco™ connections for refrigerated containers

Engineering specifications

1.0 Scope

1.1 This document covers pin and sleeve marine/industrial-grade reefer power outlet assemblies. Usable in dry, damp, wet, outdoor marine locations for providing electrical power to refrigerated containers. Assemblies shall be UL listed with enclosures incorporating interlocked reefer power outlets in a modular multi-gang arrangement. Devices are factory wired to a UL recognized power distribution block and rated 30, 32, 50 and/or 60 A at 250 or 480 V AC, 50–60 Hz. Devices are also rated for continuous use in temperatures from -20 ˚F to +140 ˚F. These devices must provide internal environmental seals for marine and extreme wet applications and are to be mechanically interlocked.

1.2 All assemblies specified shall be manufactured by Mipco™ as complete assemblies and shall be marked as stated.

2.0 Product classification

Enclosures:

2.1 **Construction –** All enclosures shall be specified either 12 or 14 gauge stainless steel and shall conform to NEMA 4X requirements for watertight, dust-tight and corrosion resistance.

2.2 **Access panel –** Each enclosure shall provide an access panel designed to allow complete wiring compartment accessibility. Bolted plate or hinged panel to be specified.

2.3 **Power distribution block –** All interlocked reefer power outlet assemblies shall be factory wired to a UL recognized power distribution block. Line lugs shall accommodate a range of wire sizes compatible with the total amperage rating of all enclosed receptacles

Receptacles

2.4 **Interlocked receptacles –** The receptacles shall be of a modular design, mechanically interlocked to allow the circuit to be energized only after a mating plug is fully inserted into the receptacle and the actuating rod is pushed forward. All interlocked receptacles shall allow the de-energizing of the circuit before mated contacts are disengaged upon plug removal. Plug ground pin will activate interlock mechanism. The mounting dimensions shall be the same for interlocked receptacles with a high (65K) or nominal (greater than or equal to 20K) inrush current circuit breaker to allow for future upgrades.

2.5 **Grounding –** The grounding of the device shall be accomplished through a separate ground (earth) that will “make first,” “break last.” Plug ground pin will activate interlock mechanism. The ground pole shall be bonded to a UL recognized ground block labeled for connection to the ground conductor. All non-current carrying metallic components must be grounded to ensure complete system grounding.

2.6 **Housings –** Receptacle housings shall be metallic, copper-free aluminum or thermoplastic with performance equal to or greater than DuraV® or AMTUF™, and have a flame rating no less than UL94 V0.

2.7 **Interiors –** Receptacle interiors must be molded thermoset UL94 V0 and be replaceable for ease of maintenance.

2.8 **Contact sleeves –** Quad-slit brass contact sleeves shall have contact pressure springs of electromotively similar material to maintain consistent contact pressure between sleeves and mating male pins and prevent galvanic corrosion.

2.9 **Environmental seals –** Each device must have an environmental seal or O-ring around all interiors and around each sleeve to prevent water and contaminants from entering the wiring compartment. The seals shall provide waterproof capability if plug or screw cap are removed.

2.10 **Circuit protection –** Each interlocked receptacle must be protected by a molded cased, thermal-magnetic type UL 489 listed circuit breaker. The circuit breaker must also comply with NEC® Articles 240 and 430 for branch circuit protection.

2.10a **High inrush current protection requirements –** Circuit breaker shall have a minimum 65,000 A interrupting capacity.

2.10b **Nominal inrush current protection requirements –** Circuit breaker shall have a minimum (18,000 A high shock) 22,000 A interrupting capacity.

2.11 **Flap cover or screw cover option –** Flap cover option must provide weather-tight capability to the exposed contacts by utilizing a spring-actuated self-closing flap. Watertight capability shall be obtained by using a gasketed screw cap.

Mipco™ connections for refrigerated containers

Engineering specifications (continued)

3.0 Design and wiring requirements

3.1 **Wiring –** All enclosure assemblies must be factory wired to conform to guidelines stated in the NEC® for wire sizing, Table 310-16 and wire bending space, Article 373-6. Wiring of individual interlocked reefer outlets must allow for the removal/replacement without opening the access door.

3.2 **Conduit entry –** Assemblies shall include a conduit entrance with an aluminum conduit hub; size and location to be specified.

4.0 Applicable compliances

4.1 **Underwriters Laboratories (UL) –** The enclosure assemblies specified herein shall be listed in applicable sections of UL Standards 489, 1682 and 1686.

4.2 **Canadian Standard Association (CSA) –** The devices shall be listed in the applicable sections of CSA C22.2-182.1.

4.3 **American Bureau of Shipping (ABS)**

4.4 **Federal Department of Transportation –** Devices shall comply with Federal Register volume 47, number 68, subpart 11.79 and the United States Coast Guard (USCG).

4.5 **International Electro-Technical Commission (IEC) –** The 32-ampere devices specified shall conform to IEC 309-1 and IEC 309-2, EN60309.

4.6 **International Standards Organization (ISO) –** The 32-ampere devices specified shall conform to ISO 1496/2, Annex L.

Notes

Additional information
We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB AG does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

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