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Computer System Interconnections – Overview

Defined

- Any application where electrical connections must be protected from humidity, water, condensation and/or dust ingress to 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.

Russellstoll Line Selections for Outdoor (and Indoor) Applications

DuraGard to 4P4W 20 thru 50A

The toughest construction in thermoplastic safety, durability and performance by design, in UL94-V0 flame rated DuraV material. With DurOring sealed pins, sleeves and interiors watertight even unmated. A 30 & 50A unique circuit breaker interlock line in DuraV is the best choice in all standard voltage polarization options through 600VAC (Interlock to 480VAC)

Angle Type to 3P4W 60A use

The original 60A main power computer system connector, Angle Type plugs are also available in specialty UL94-V0 material. (Alum. Connectors) As part of the MRO usage 30-200A Angle Type Line, the 60A connector is still commonly used today. Other lines such as MaxGard should be used for changeout when possible.

SpecGrade to 4P4W 20 & 30A

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 UL94-5VA flame rated material. Spec Grade features DurOring sealed pins, sleeves and interiors, watertight even unmated. Spec Grade devices have been superseded by DuraGard ratings for OEM use.

MaxGard 30A to 4P5W

For DP/Computer System Applications, a special MaxGard polarization reflects DP installations. Special thermoplastic housing and back handle are supplied for these applications. Use wherever 4P5W installations are required.

FS/FD to 3P4W 15 thru 30A

The original 15/20/30A 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.

IEC: IP67 to 4P5W 20 to 100A

Thermoplastic International standard 309-2 or CEE-17 type connector lines usage is growing, especially in OEM, export, and standard performance applications. The IP67 style is watertight when mated and directly interchangeable with other manufacturers. International designations shadow U.S. ratings: 20/16, 30/32, 60/63 and 100/125. IP67 devices have screw collars or flap/screw covers, with catalog number "W" suffixes.



Typical Application Groups

Telephony Equipment
Switching Rack Systems
Power Distribution Units
Test & Laboratory Equipment

Mainframes from 30-270A
Peripherals
Data Storage Devices
Military or Critical Power Supplies

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Computer System Plugs, Connectors and Receptacles


Over 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 a safe, reliable connection that exceeds 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 & Sleeve power connections are chosen for Computer Systems interconnections because of the absolute performance required in today's mainframe and peripheral installation. Pin & Sleeve connections have been proven to be 1- times more reliable in service than any bladed device. Data centers stay in service, because Russellstoll stays connected.

Quick Selection Chart

				
SERIES*	FS/FD	Spec Grade	DuraGard®	Spec Grade
Available Ranges (Amp)	20 & 30	20 & 30	20, 30 & 50	30 (IEC)
Safety Grade™ UL Flame rated High-Temp Thermoplastic	UL94-V0 Aluminum	UL94-5VA	UL94-V0	UL94-V0
Easy-to-Wire Rear loaded interiors		✓	✓	✓
Single Rated Safety Voltage Polarizations	20A	20A 30A	20A 30A 50A	30A (9h – IEC)
Waterproof O-Ring Seal (pins, sleeves & interiors)		✓	✓	✓
2nd Internal Ground Lug (cable shielding alt.)		✓	(optional)	
External Cable Clamp	✓		✓	✓
External Gland Nut Lock			✓	✓

* 60A devices are specially designed versions of Russellstoll Angle Type (7328DP)



E2630



LR14096


















TüV For TÜV listed devices, contact Technical Services.

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Computer System Plugs, Connectors and Receptacles – Ordering Information

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			Plugs				Connectors		Receptacles		
											
	Voltage	Plug Safety Polarization	Std. Cable** Bushing	FS/FD• Aluminum	Spec Grade UL94-5VA	See Bushing Chart DuraGard® UL94-V0*	FS/FD Aluminum	DuraGard® UL94-V0*	FS/FD• Aluminum	DuraGard® UL94-V0*	
2P/3W	15/20 Amp	Up To 600 VAC/250VDC		0.625" 0.455" 0.405"	3720	3720DP (0.375) 3720DP/0455 3720DP/0405	9P23U0	3913	9C23U0	3743	9R23U0W▼
		125VAC		0.625" 0.455" 0.405"	3720U1	3720DPU1 (0.375) 3720DPU1/0455 3720DPU1/0405	9P23U1	3913U1	9C23U1	3743U1	9R23U1W▼
		250 VAC		0.625" 0.455" 0.405"	3720U2	3720DPU2 (0.375) 3720DPU2/0455 3720DPU2/0405	9P23U2	3913U2	9C23U2	3743U2	9R23U2W▼
	30 Amp	Up To 600 VAC		0.760" 0.700" 0.625"	3750	3750DP	9P33U0	3933■	9C33U0■	3753■	9R33U0W▼■
	50 Amp	Up To 600 VAC		1.000" 0.925" 0.750"	–	–	9P53U0	–	9C53U0	–	9R53U0W●
3P/4W	20 Amp	Up To 600 VAC/250 VDC		0.688" 0.625" 0.606"	3730	– 3730DP/0625 3730DP	9P24U0 –	3914 –	– 9C24U0 –	3744	9R24U0W▼
	30 Amp	Up To 600 VAC		1.100" 1.000" 0.875" 0.760"	3760	3760DPG/1100 3760PDG/1000 3760PDG/0875 3760DPG0760	– 9P34U0◆	– 3934■	– 9C34U0◆■	3754■	9R34U0W▼■
	50 Amp	Up To 600 VAC/250 VDC		1.000" 0.925" 0.750"	–	–	9P54U0	–	9C54U0	–	9R54U0*▼
Special MaxGard®											
3P/4W	60 Amp	Up To 600 VAC	 Angle Type	1.375" 1.188" 1.020" 0.750"	7328-78^	– – – –	7328DP/1375 – 7328DP† 7328DP/0750	7428-78^	– – – –	–	SCF7324-78
Special Angle Type											
4P/5W	30 Amp	3øY 120/208 VAC	 MaxGard	0.775"	–	–	DS3516MPDP+	DS3516FP+	–	DS3516FR+	–

Note: All 20A devices are compatible. 30A 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 H44-H54.

** Consult Factory for additional cable bushing sizes not listed.

† 7328 DP series thermoplastic can replace 7328 metallic.

• 30A 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 30/50A will accept only DuraGard or Spec Grade. FS/FD Aluminum 30A plugs must be used with FS/FD metal connectors or receptacles..

^ Angle Type Line

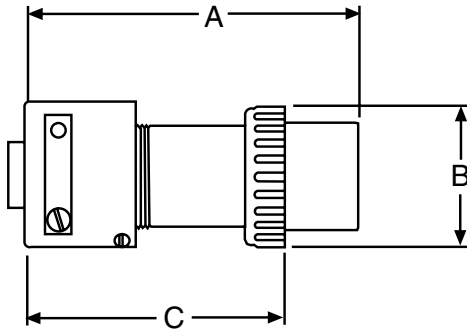
+ MaxGard Line for further information see pages H9-H29.

▼ Requires 3711A conduit FD box or 3781A DSFD Box (50A).

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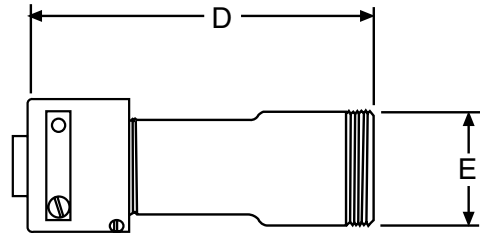
Computer System Plugs, Connectors and Receptacles – Dimensions

Plugs



		A	B	C
FS/FD	20 Amp	3 ⁵ / ₈ "	2"	2 ¹ / ₄ "
	30 Amp	3 ³ / ₄ "	2 ¹ / ₄ "	2 ³ / ₈ "
Angle Type DP (Thermoplastic)	60 Amp	8"	2 ¹ / ₂ "	3 ³ / ₄ "
Spec Grade DuraGard®	20 Amp	3 ¹ / ₄ "	2 ¹ / ₈ "	2 ¹ / ₈ "
	30 AMP	5"	2 ³ / ₈ "	3 ⁵ / ₈ "
	50 AMP	5 ¹ / ₄ "	2 ³ / ₈ "	3 ⁵ / ₈ "

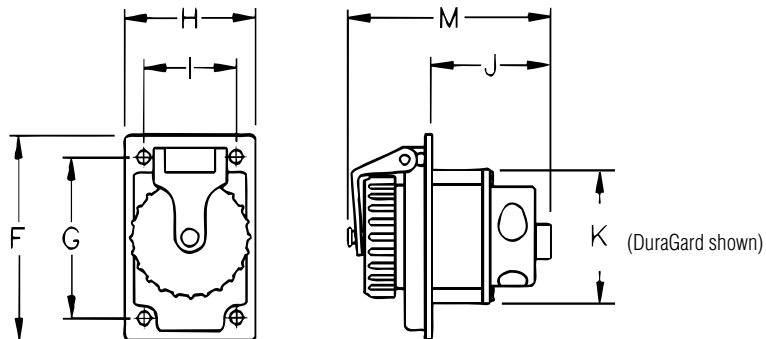
Connectors



		D	E
FS/FD	20 Amp	4"	1 ⁷ / ₈ "
	30 Amp	4 ⁵ / ₈ "	2 ¹ / ₈ "
Angle Type (Metallic)	60 Amp	9 ¹ / ₈ "	3 ¹ / ₂ "
Spec Grade DuraGard®	20 Amp	4 ¹ / ₈ "	1 ⁷ / ₈ "
	30 AMP	5 ⁵ / ₈ "	2 ¹ / ₈ "
	50 AMP	5 ⁵ / ₈ "	2 ¹ / ₈ "

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Receptacles



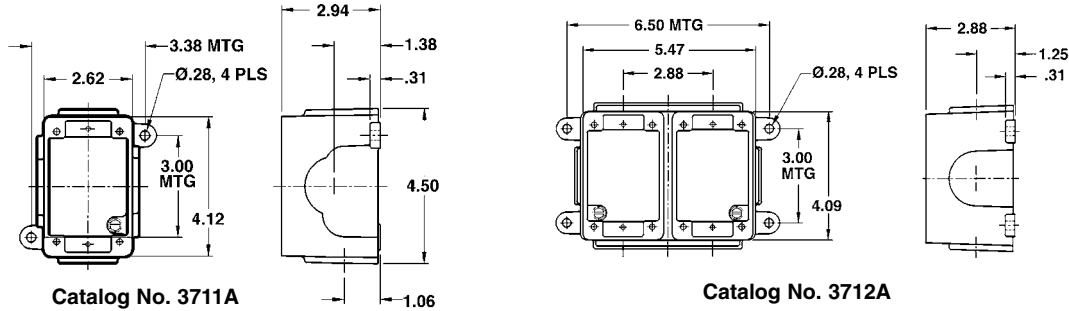
		F	G	H	I	J	K	M
FS/FD	20 AMP	4 ¹ / ₈ "	3 ¹ / ₄ "	2 ⁵ / ₈ "	1 ⁷ / ₈ "	1 ¹ / ₈ "	2 ¹ / ₄ "	2 ¹ / ₂ "
	30 AMP	4 ¹ / ₈ "	3 ¹ / ₄ "	2 ⁵ / ₈ "	1 ⁷ / ₈ "	1 ³ / ₈ "	2 ³ / ₄ "	2 ⁵ / ₈ "
Angle Type (Metallic)	60 Amp	3 1/2"	2 ⁷ / ₈ "	3 ¹ / ₂ "	2 ⁷ / ₈ "		2 ¹ / ₂ "	6"
DuraGard®	20 Amp	4 ¹ / ₈ "	3 ¹ / ₄ "	2 ⁵ / ₈ "	1 ⁷ / ₈ "	1 ¹ / ₂ "	2"	3 ³ / ₈ "
	30 Amp	4 ¹ / ₈ "	3 ¹ / ₄ "	2 ⁵ / ₈ "	1 ⁷ / ₈ "	2 ¹ / ₂ "	2 ³ / ₄ "	4 ¹ / ₈ "
	50 Amp	4 ¹ / ₈ "	3 ¹ / ₄ "	2 ⁵ / ₈ "	1 ⁷ / ₈ "	2 ¹ / ₂ "	2 ³ / ₄ "	4 ¹ / ₈ "

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Computer System Plugs, Connectors and Receptacles – Accessories

All conduit boxes/Angle Adapters are copper free, cast aluminum, epoxy powder coat finish.

Conduit Boxes (For Surface Mounting)



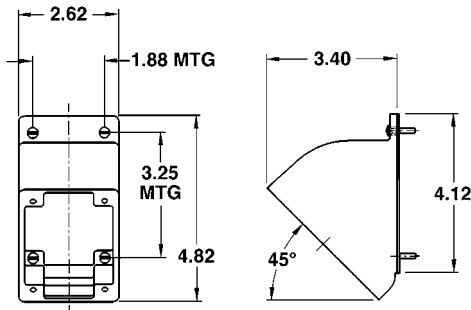
Catalog No. 3711A

Catalog No. 3712A

Receptacle size	Cat. No.	
	Single Gang	Double Gang
20, 30 & 50 Amp	3711A	3712A
60 Amp*	JB6-1	
50 Amp	3781A	3782

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

Angle Adapter



Catalog Number 3678A

Receptacle size	Cat. No.	
	45 Degree	20 Degree
20, 30 & 50 Amp	3678A	—
60 Amp*	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.

Conduit Adapter

Kit includes gland nuts for plugs or connectors.



Plug/ Connector Size	Tapped Hole Size	Cat. No.		
		FS/FD	Spec Grade	DuraGard®
20 Amp	1/2"	FSA11	—	9X2C50
	3/4"	FSA12	—	9X2C75
30 Amp	1/2"	FSA21	—	9X3C50
	3/4"	FSA22	—	9X3C75
	1"	FSA23	—	—
50 Amp	3/4"	—	—	9X5C75
	1"	—	—	9X5C10
60 Amp Angle Type	3/4"	JPA62	—	—
	1"	JPA63	—	—
	1 1/4"	JPA64	—	—
	1 1/2"	JPA65	—	—



Russellstoll[®]**Computer System Plugs, Connectors and Receptacles – Accessories****Plug/Connector Replacement Items**

	Spec Grade	DuraGard	Spec Grade	DuraGard	
Item Color	Blue	Yellow	Blue	Yellow	Black
Plug/Connector Amperage	20A	20A	30A	30A	50A
Gland Nut	C17077C	C17077A	C17076CX	C17076AX	C17076BX
Nylon Locking Screw	N/A	NA	B16983	B16983	B16983
Bushing, Clamp, Nut, and Screw Kit (Inc. Nylon Locking Screw – 30/50A)	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.

HRussellstoll[®]**Replacement Interiors**

Note: For replacement bushings, see DuraGard Section, pg. H51.

		Cat. No.	
		Male Interior Assembly	Female Interior Assembly
			
Amperage	Voltage Polarization		
2P3W 20	125 VAC	9XM23U1	9XF23U1
	250 VAC Thru 600VAC/250 VDC	9XM23U2 9XM23U0	9XF23U2 9XF23U0
2P3W 30	Thru 600VAC/250VDC	9XM33U0	9XF33U0
	Thru 600VAC/250VDC	9XM53U0	9XF53U0
3P4W 20	Thru 600VAC/250VDC	9XM24U0	9XF24U0
	Thru 600VAC/250VDC	9XM34U0	9XF34U0
3P4W 50	Thru 600VAC/250VDC	9XM54U0	9XF54U0

Interiors with ground straps are specials.

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Computer System Plugs, Connectors and Receptacles – Specifications

Performance – Electrical

Dielectric Voltage Withstand	3,000 Volts
Max. Working Voltage	6000 volts 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 .75-PF.
Shrouded Contacts	Complies with California Code Title 8, Art. 51, S2510.7(b) for devices exceeding 300 VAC
Horsepower	Per NEC 430-151 ratings

Performance – Mechanical

Impact Resistance	Per UL 1682 Paragraph 34
Cord Accommodation	Round portable service cords per UL Std. 62 & CSA C22.2 No. 49.1
Terminal Identification	In accordance with UL1682
Cable Pull Out Force	In accordance with UL1682
Product Identification	Identification label and molded in name
Lockout/Tagout	Lockout/Tagout hole in 30/50A DuraGard® plug complies with OSHA Reg. 29 CFR 1910.147 (V0 30 & 50A plugs only)

Performance – Environmental

Moisture Resistance	Per UL1682 Paragraph 49. Watertight flap screw cover on receptacle, O-Rings on all V0/5VA pins and sleeves (excludes 60A)
Flammability	V0 / 5A per UL94 (DuraV also 5VA in some apps.)

Operating Temperatures

	V0*	5VA	Metal*
Maximum Continuous	95°C (230°F)	130°C (266°F)	130°C (266°F)
Minimum W/o Impact	-40°C (-40°F)	-29°C (-20°F)	-40°C (-40°F)

Chemicals

Resists standard industrial hydrocarbons, acids, bases and solvents. (DuraV & Metal)

Approvals



Conforms to NEMA 4, 4X & 6. (DuraGard and Spec Grade) Contact Technical Services.

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Materials

	FS/FD	Spec Grade	DuraGard® Safety Grade™
Contact Carrier Interior	Thermoset / Thermoplastic (20A & 30A)	Arc resistant UL94-V0 phenolic Thermoset	Arc resistant UL94-V0 phenolic Thermoset
Housing, Gland Nuts	Cast Aluminum	Lexan® UL94-5VA,	DuraV™ UL94-V0,
Screw Collar Rings	–	High Impact Thermoplastic	High Impact Thermoplastic
O-Rings	–	Buna-N (Nitrile)	Buna-N (Nitrile)
Contacts: Pins & 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	–	20 Amp - Nylon 30 & 50 Amp - Aluminum
	–	Nylon	
Cable Clamp Bushing	Neoprene	Neoprene	Neoprene

Lexan® is a registered trademark of GE.

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Computer System Plugs, Connectors and Receptacles – Data Center Installation



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 & CSA listed and can be configured for many inlet/outlet combinations.

Standard Dual Configuration:

- 60A 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 22kA interrupt capacity interlocked circuit breaker protection for each branch outlet receptacle, in a NEMA 4 enclosure.

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.

Electrical and Safety Features

- One: 250VAC 3p4w 60A male inlet feeding Two: 250VAC 3p4w 30a IEC 309-2 (9h Blue) female receptacle outlets, each protected by 22kA IC 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.
- Patented "Trip-Free" Safety Mechanism where outlets are not powered unless plug is inserted.
- Full NEMA rated UL 489 listed 22kA Circuit Breakers, available to 480V at 30 Amps. 60 Amp and other options available.

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 & nylon external hardware, copper-free aluminum castings, O-ring seals (to device spec) & brass electrical contacts.

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Computer System Plugs, Connectors and Receptacles – Data Center Installation

Ordering Information

Cat. No.	Inlet Side		Outlet Side*	
	250VAC, 60A Male Inlet	Mating Connector	250VAC, 30a Outlet Receptacle	Mating Plug
ER206M39	7528 Spl.	7428-78	RS430MM9W (x2)	RS430P9WV0

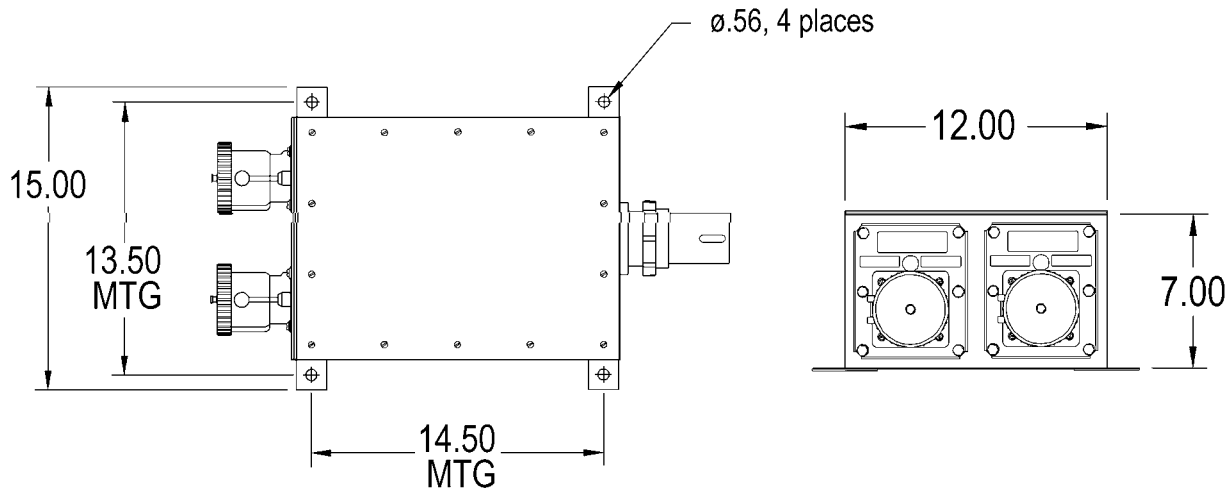
(External mating Plugs & Connectors sold separately)

Other Configurations available. Consult factory or your Russellstoll Representative

* IEC 309-2 configuration, 9h, 3P4W

Outline Dimensions

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Schematic Diagram

