

POWERSAFE

New version according to VG96944
derived from MIL-DTL-38999 Series III/EN3645



Amphenol



Connecting people + Technology

www.amphenol-socapex.com

For over 75 years, Amphenol Socapex has provided reliable interconnect solutions to a large base of customers worldwide. The company manufactures both standard connectors and custom solutions to address specific needs and industry requirements.

PowerSafe MIL-DTL-38999 Series III derivated product was developed to transmit high power with voltage over 500V in high demanding environments, in keeping the full safety of the user.

Main Features

- Focus both on **USER SAFETY** and on the **MIL-DTL-38999 Series III performances**
- **First mate/last break:** One earth contact linked to the shell
- **Last mate/first break:** One pilot contact to be used as a relay of power break before disconnecting the mated pair
- **Socket inserts are** IP2X (finger test)

USER
SAFETY



Added Benefits

- In accordance with the new standard for power equipment
- Homogeneity with standard MIL-DTL-38999 III connectors when power is needed on the equipment (same panel drilling)
- Qualification in progress according to the most stringent standards:
 - ▶ User safety: DIN EN-61984 (VDE 0627)
 - ▶ Product standard: VG96944

Markets & Applications

Markets

- **Defense:** C4ISR/Battlefield/Ground Vehicles/Missile
- **Avionics**
- **Harsh industrial markets**

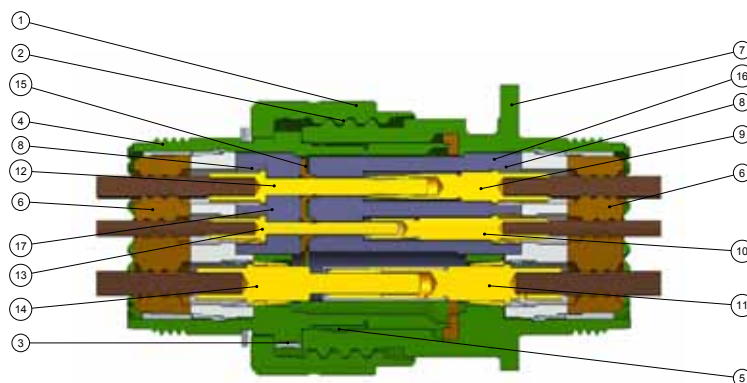
Applications

- I/O Power for boxes
- Power connectors spread on the field (drums)
- Electrical power generator



Mechanical Characteristics

- | | |
|------------------------------------|---------------------------------|
| ① Coupling nut | ⑩ Pilot socket contact |
| ② Quick coupling thread | ⑪ Protective socket contact |
| ③ Anti-decoupling device | ⑫ Phase and neutral pin contact |
| ④ Plug shell | ⑬ Pilot pin contact |
| ⑤ Spring fingers (EMI) | ⑭ Protective pin contact |
| ⑥ Grommet | ⑮ Interfacial seal |
| ⑦ Receptacle shell | ⑯ Socket insert |
| ⑧ Contact retention clips | ⑰ Pin insert |
| ⑨ Phase and neutral socket contact | |



Durability	500 cycles
Shock	Half sine wave of 300 G magnitude during 3ms per EIA364.27
Sine vibrations	60 g from - 55°C to + 175°C (olive drab cadmium finish) 60 g from - 55°C to + 200°C (nickel finish and firewall version)
Random vibrations per EIA364.28	1G ² / Hz at 175°C olive drab cadmium finish 1G ² / Hz at 200°C nickel finish and firewall version 5G ² / Hz at ambient
Shell size	13/17/25 (3 arrangements)
Shell and Backshell plating	O.D cadmium, Black Zinc Nickel, Electroless Nickel
Insert material	Thermoplastic insert Silicone rubber back insert and interfacial seal
Contacts	Crimp, removable contacts Gold plated or silver plated

Contact retention force:

Contact Size	20	16	12	6
Maximum load (N)	67	111	111	111

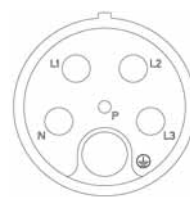
Environmental Characteristics

Temperature range	-65°C to + 200°C (Electroless Nickel plating) -65°C to + 175°C (O.D Cadmium, Black Zinc Nickel platings)
Salt spray exposure per EIA 364.26	-500H Black Zinc Nickel -500H O.D Cadmium -48H Electroless Nickel
Sealing	IP 68 (48H immersion under 2 meters) when mated and with the suitable backshells (see page 6)

Electrical Characteristics

Arrangements	Operating voltage AC or DC	Contact rating		
		Pilot contact	Phase and neutral contacts	Protective contact
13-E4	250 V	7.5 A	16 A	16 A
17-E6	250 V	13 A	25 A	25 A
25-E6	500 V	13 A	63 A	63 A

Insert Arrangements

**13-E4****17-E6****25-E6**

Pilot contact	1 Size 20	1 Size 16	1 Size 12
Phase & neutral	2 Size 16	4 Size 12	4 Size 6
Protective contact	1 Size 16	1 Size 12	1 Size 6

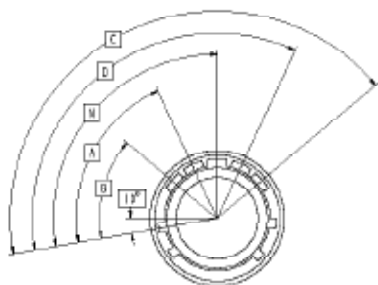
Other platforms in development. Please consult us.

Polarization

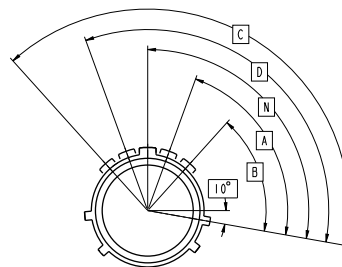
To avoid cross-plugging problems in applications requiring the use of more than one PowerSafe connector of the same size, alternate key-rotations are available as indicated in the chart aside. As shown in the accompanying diagram, the major key rotates clockwise from the secondary ones.

In the reference system, the polarization is shown by the letters N, A, B, C, D.

Shell size	Position of the major keyway				
	Polarizations				
	N	A	B	C	D
13	100	80	68	132	120
17	100	82	70	130	118
25	100	85	74	126	115



Receptacle - Front face shown



Plug - Front face shown

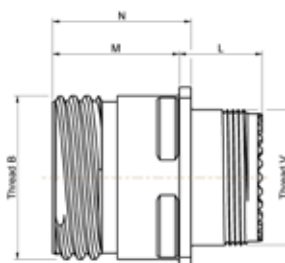
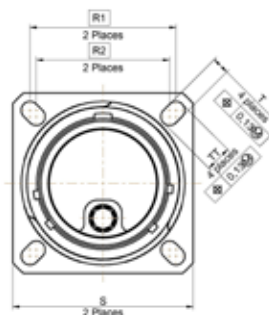
Overall Dimensions

Square flange receptacle

TVP00RW

TVP00ZN

TVPS00RF



Shell size	B thread Class 2A .1P-.3L-TS (inches)	L Max (mm)	M 0 -0.13 (mm)	N +0.13 0 (mm)	R1 (mm)	R2 (mm)	S ±0.3 (mm)	T ±0.2 (mm)	TT ±0.2 (mm)	V thread metric
13	.875	15.5	19.5	22.99	23.01	20.62	28.6	3.25	4.93	M18x1-6g
17	1.1875	15.6	22	25.49	26.97	24.61	33.3	3.25	4.93	M25x1-6g
25	1.625	20.7	23.2	27.49	38.1	34.93	46	3.91	6.15	M37x1-6g

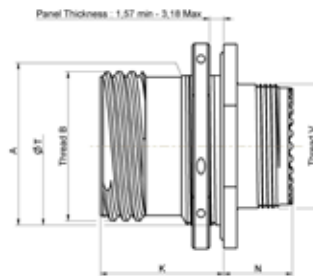
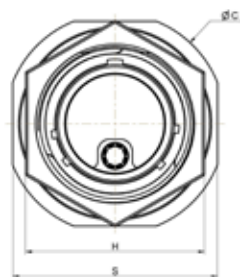


Jam nut receptacle

TV07RW

TV07ZN

TVS07RF



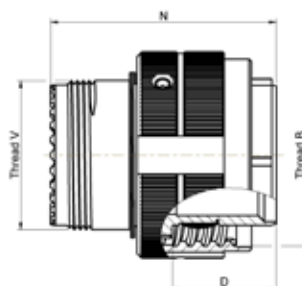
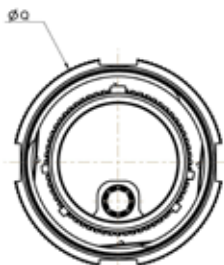
Shell size	B thread Class 2A .1P-.3L-TS (inches)	A +0.1 -0.15 (mm)	C Max (mm)	K (mm)	N (mm)	H Hex 0 -0.1 (mm)	S +/-0.4 (mm)	T 0 -0.13 (mm)	V thread metric	Hex nut max torque N.m
13	.875	23.82	38.4	22.6	13.9	30	34.9	25.35	M18x1-6g	6.9
17	1.1875	30.15	44.7	25.1	13.9	36	41.3	31.95	M25x1-6g	9.8
25	1.625	42.85	59	27.1	25.9	50	55.6	44.43	M37x1-6g	15

Straight plug

TV06RW

TV06ZN

TVS06RF

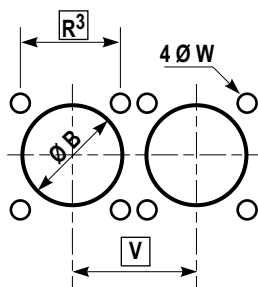


Shell size	B thread Class 2A .1P-.3L-TS (inches)	Q Max (mm)	N (mm)	D (mm)	V thread metric (mm)
13	0.875	29.4	35.5	15.01	M18x1-6g
17	1.1875	35.7	38	17.51	M25x1-6g
25	1.625	48	46	19.51	M37x1-6g

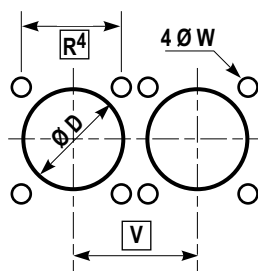
* Conforms to CECC 75.201.002 (coupling nut for arctic gloves)

Panel drilling for receptacles

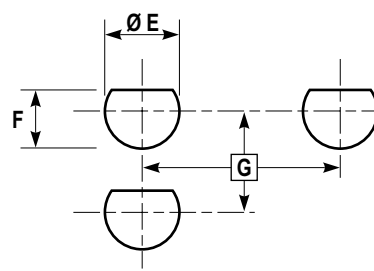
Square flange receptacle
rear panel mounting



Square flange receptacle
front panel mounting

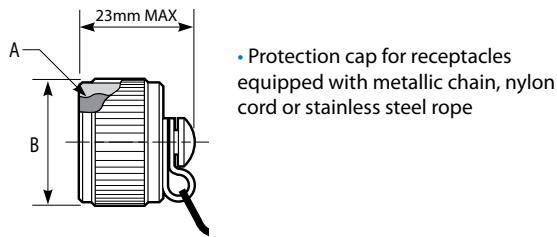


Jam nut receptacle
rear panel mounting

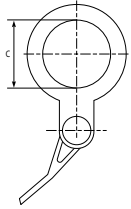


Shell size	R³ (mm)	R⁴ (mm)	V Mini (mm)	ØB Min (mm)	ØD Min (mm)	ØW ±0.13 (mm)	G Mini (mm)	ØE +0.25 0 (mm)	F 0 -0.25 (mm)
13	23.01	20.62	30.20	23.42	19.05	3.25	36.00	25.65	24.26
17	26.97	24.61	36.50	30.96	25.81	3.25	43.30	32.01	30.73
25	38.10	34.93	48.80	42.47	37.69	3.81	59.70	44.70	43.43

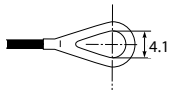
Protective Caps



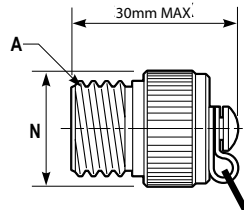
- Protection cap for receptacles equipped with metallic chain, nylon cord or stainless steel rope



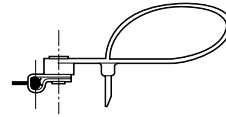
- Termination of the chain, rope (RO type) or cord for jam nut receptacle protection caps



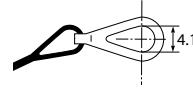
- Termination of the cord or rope (R type) for square flange receptacle protection caps



- Protection cap for plugs equipped with metallic chain, nylon cord or stainless steel rope



- Termination of the cord for plugs protection caps



- Termination of the chain for square flange receptacle and plug protection caps

Ordering information

Cap type	Metallic chain length (mm)	Nylon cord length (mm)	Stainless steel rope length (mm)
BEC/BER for receptacle	152	105	127
BF for plug	127	160	127

Shell size	A thread 0.1P-0.3L-TS Class 2B (inches)	B Dia Max (mm)	C Dia Min (mm)	N Dia Max (mm)
13	0.8750	28.58	25.81	29.74
17	1.1875	36.53	32.16	36.47
25	1.6250	47.63	44.86	48.62

Cap Series	B	EC	N	TV	W	15
Protection cap type EC: For square flange receptacle ER: For jam nut receptacle F: For plug Wire type N: Nylon cord Blank for metallic chain R: Jacketed stainless steel rope RO: Jacketed stainless steel rope with washer end (only for plug) Connector type Finish F: Electroless nickel plated W: Olive drab cadmium plated ZN: Black zinc Nickel Corresponding connector shell size: 13/17/25						

NEW

ROHS

Backshells

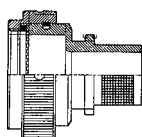
- Compatible with AS85049 suitable for MIL-DTL-38999 Series III connectors
- For IP68 sealing, we recommend the following backshells:



Shell size	Backshell from EMCA	Shrink boot pre-coated	Clamping bands
13	VG95319-1011G012A	VG95343T29B001A	895693 or A10089
17	VG95319-1011G005A	VG95343T29B003A	
25	VG95319-1011G010A	VG95343T29B006A	

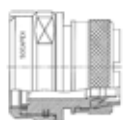
- Other backshells for shielding:

SHIELDING



TV-35: BAND BACKSHELL FOR SHIELDING

- Full 360° shield termination
- Available with different cabling chambers
- Easy maintenance or repairability
- Sealing ensured by straight or right angled heat-shrink molded piece
- Right angle version: TV SBC



TV NSA: HIGH LEVEL OF EMI/RFI PROTECTION

- Electrical continuity between cable and connector by clamping the braid with a screwing system
- Free inner ring to avoid twisting of the braid when screwing
- Sealing ensured by straight or right angle heat-shrink molded piece

How to Order

Series	TV	P00	RW	13 E4	P	A
Shell type Square flange receptacle: 175°C (O.D. cadmium+ZN Ni): P00 200°C (nickel): PS00 Jam nut receptacle: 175°C (O.D. cadmium+ZN Ni): 07 200°C (nickel): S07 Straight plug: 175°C (O.D. cadmium+ZN Ni): 06 200°C (nickel): S06						
Shell material, finish and contact type Aluminium RW: Olive drab cadmium plated 175°C, crimp contacts ZN: Zinc Nickel plated 175°C, crimp contacts RF: Electroless nickel plated 200°C, crimp contacts For green Zinc Cobalt over Aluminum, Bronze Marine or Stainless steel: please consult us						
Shell size & Contacts arrangement 13-E4 17-E6 25-E6						
Contact type P: Pin S: Socket						
Polarization Blank for normal or A, B, C, D						

Contacts and Tools

TOOLS FOR VG 96944 / POWERSAFE CONNECTORS																				
Arrangement	Contact type	Size	Contacts		Wires				Wire stripping length	Crimping tools			Insertion tools			Removal tools				
			Proprietary	Part Number	AWG	Section mm²	dia over insulator			Tools	Positioner	Selector position	Plastic		Metallic		Plastic		Metallic	
			Pin	Socket			Min	Max					color	Straight type	Angle type	color	Straight type	Angle type		
13-E4	Pilot	20	600665	900041	20 22 24	0,61 0,38 0,24	1,02	2,11	+0,5 6 0	M22520/1-01	M22520/1-04	3 2 1	M81969/14-10 red / orange	809817	M81969/8-05	M81969/14-10 red / orange	809847	M81969/8-06		
	Phase Neutral	16	600666	600676	14 16 18 20	1,94 1,23 0,96 0,61	1,65	2,77				6 6 5 4	M81969/14-03 blue / white	809816	M81969/8-07	M81969/14-03 blue / white	809846	M81969/8-08		
	Protective		600667	600677	/	/														
17-E6	Pilot	16	600660	900040	16 18 20	1,23 0,96 0,61	1,65	2,77	+0,5 6 0	M22520/1-01	M22520/1-04	6 5 4	M81969/14-03 blue / white	809816	M81969/8-07	M81969/14-03 blue / white	809846	M81969/8-08		
	Phase Neutral	12	600661	600671	12 14	2,98 1,94	2,46	3,61				8 7	M81969/14-04 yellow / white	809824	M81969/8-09	M81969/14-04 yellow / white	809850	M81969/8-10		
	Protective		600662	600672	/	/														
25-E6	Pilot	16	600660	900040	16 18 20	1,23 0,96 0,61	1,65	2,77	+0,5 6 0	M22520/1-01	M22520/1-04	6 5 4	M81969/14-03 blue / white	/	/	M81969/14-03 blue / white	/	/		
	Phase Neutral	6	600663	600673	6	13,61	7,3	8,1	+1 14,5–0,5	809947 + 809908 or M22520/23-01 + M22520/23-03 + 809697	/	/	/	/	/	809696				
	Protective		600664	600674						/	/									

Shell size	Qualified Cables for VG96944
13-E4	VG95218T028C008
17-E6	VG95218T028C010
25-E6	VG95218T028C012

Crimping tools

MANUAL CRIMPING PLIERS
M22520/1-01



HYDRAULIC PLIERS
809947



PNEUMATIC PLIERS
M22520/23-01



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Designed by Amphenol Socapex
January 2014

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