



Amphenol

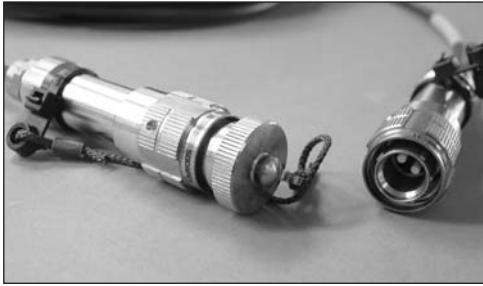
Fiber Optic Solutions

EWOC

Environmental Weatherproof Optical Connectors

TVOP - LJTOP - RNJOP - STARTOP

butt joint connectors
harsh environment



TVOP, LJTOP, RNJOP and Startop product range offers the most comprehensive range of ruggedized optical connectors based on MIL DTL 38 999 Series and its derivatives. More than ten years ago, Amphenol developed the first generation of optical termini for multiway connectors in accordance with the MIL 29504 specification. Combined with the MIL DTL 38 999 serie III shells, the Startop offers the intermateability with other MIL 29504. The new generation TVOP, LJTOP, RNJOP uses the proven 38 999 or derivated shell, and the standard termini (\varnothing 2.5 mm) which is designed to provide a high reliability performance and cost effectives solutions for outdoor and indoor applications.

These products are widely used in navy, rail + mass transit, industrial, aeronautic civil and military applications.

- Wide range of various locking mechanism :
 - Screw
 - Bayonet
 - Rackable
- Developed for 100% Scoop proof and blind mating
- Up to 8 channels
- Wavelength 850 - 1300 nm -1550nm
- Multimode for all series
- Singlemode for TVOP and LJTOP

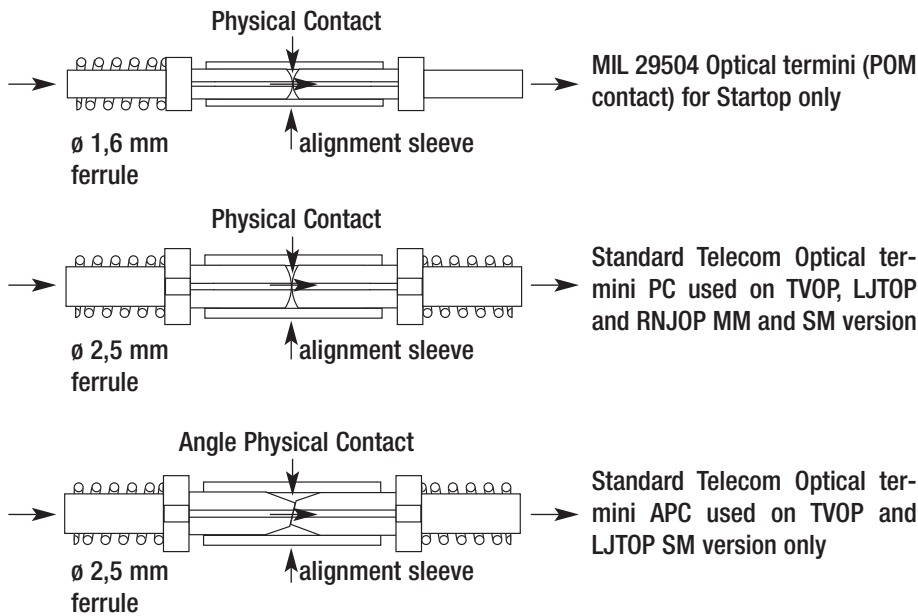
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BUTT JOINT TECHNOLOGY / INSERT ARRANGEMENT

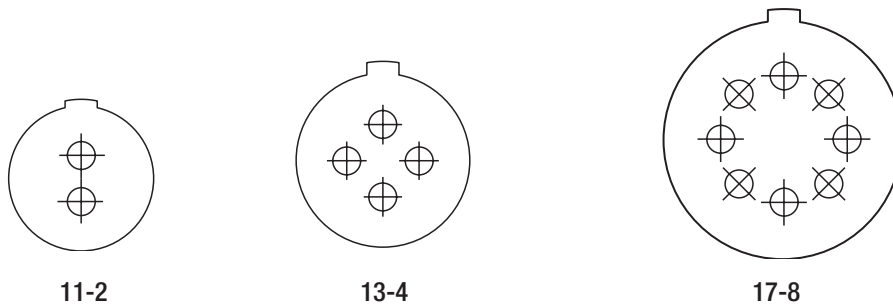
■ TVOP, LJTOP, RNJOP, STARTOP BUTT JOINT TECHNOLOGY KEY FEATURES



With AMPHENOL SOCAPEX's butt joint technology, fibers are permanently in physical contact, thanks to the spring loaded contact. The alignment sleeve guarantee the alignment for high reliability optical performance. These connector are highly resistant to vibrations, shocks, temperature.

■ INSERT ARRANGEMENT

For TVOP, LJTOP and RNJOP : standard ø2,5mm optical termini



For Startop only : MIL 29504 Optical termini size 16



BUTT JOINT TECHNICAL SPECIFICATION



TVOP	LJTOP	RNJOP	Startup
8	8	8	8
0,5/0,8db EIA-455-34 method A		0,8/1,0db CEI 793-1-4	
0,5db/0,8db EIA-455-34 method A		NA	
-30db -45db -55db EIA-455-107		NA	
500 cycles EIA-455-21		500 cycles NFC 93 422	
Sin. 10 to 2000HZ, 10g, peek to peek 1,52mm (0.06 inch), 3 directions Random 50 to 2000HZ, 10g ^r /Hz, 3 directions MIL-STD-1344 method 2005		Sin. 5 to 55Hz, 2g NFC 93422, peek to peek 2mm, 2 directions CEI 68.2.6	
30g, 11ms, sawtooh, 3 shocks per direction, 3 directions EIA-455-14 condition I		15g, 11ms, half sine, 2 shocks per direction, 2 directions 100g, 6ms, half sine, 2 shocks per direction, 2 directions CEI 68.2.7	
Nickel shell 48H Olive drab cadmium 500H MIL-STD-1344 method 1001 A			
-46°C +85°C MIL 83 522		-40°C/+85°C CEI-68-2-1/CEI-68-2-2	
-62°C +85°C DOD-STD-1678 method 4020			
IP67 CEI 529/EN 60529		IP67 CEI 529/EN 60529	
100daN MIL-STD-1344 method 2009	NA	80daN NFC 93 422	



TVOP

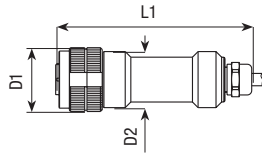
TVOP



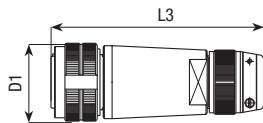
TVOP PLUG : TVOP 06

TVOP Plug with straight backshell and integrated metal clamp
TVOP 06 X S3 XX X XX X XXXX

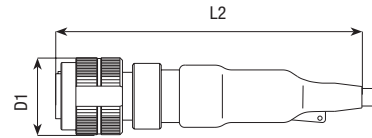
TVOP Plug with straight backshell and integrated plastic clamp
TVOP 06 X S4 XX X XX X XXXX



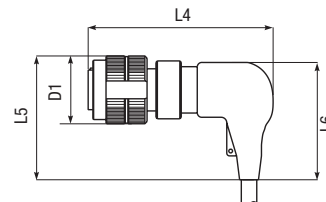
TVOP Plug with straight backshell and tightening jaws clamp
TVOP 06 X S5 XX X XX X XXXX



TVOP Plug with straight heatshrinkable backshell
TVOP 06 X H0 XX X XX X XXXX



TVOP Plug with right angle heatshrinkable backshell
TVOP 06 X H9 XX X XX X XXXX



Overall dimensions

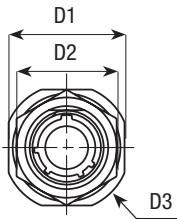
Shell Size		øD1	øD2	L1	L2	L3	L4	L5	L6
MIL.DTL. 38999 Series III	Amphenol Socapex	mm	mm	mm	mm	mm	mm	mm	mm
B	11	24.13	21	87.5	95.33	96.13	67.63	44.1	40.6
C	13	28.47	25	87.5	107.33	96.13	71.33	53.2	49.7
E	17	35.20	32	109.5	120.13	96.13	78.33	56.6	59.2

HOW TO ORDER TVOP PLUG

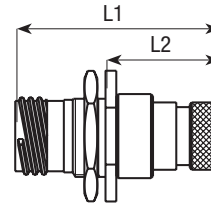
Series	TVOP	06	X	XX	XX	X	XX	X	XXXX
Shell type	06 : Plug								
Shell finish	F : Aluminium, electroless nickel plated W : Aluminium, olive drab cadmium plated B : Bronze								
Backshell	H0 : Straight angle heatshrinkable backshell without clamp H9 : Right angle heatshrinkable backshell without clamp S3 : Straight backshell for multiway cable with metal integrated clamp S4 : Straight backshell for multiway cable with plastic integrated clamp S5 : Straight backshell for multiway cable with tightening jaws clamp								
Shell size	Max Number of Channel								
11	2								
13	4								
17	8								
Type of ceramic ferrule	Ceramic ferrule inner diameter								
Multimode	7 : 127 µm								
Singlemode	6 : 126 µm								
Polarization :	N : for standard A, B, C, D, E : for special keying								
Cable diameter example	X055 : ø 5,5 mm multiway cable								

TVOP RECEPTACLE : TVOP JAM NUT RECEPTACLE : TVOP 07

TVOP Jam Nut Receptacle Front Face



TVOP Jam Nut Receptacle with backshell for pigtails
TVOP 07 X R0 XX X XX X XXXX

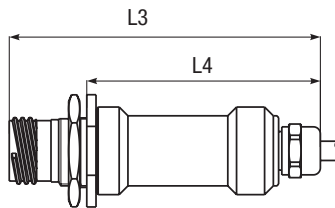


TVOP Jam Nut Receptacle with straight backshell and integrated metal clamp

TVOP 07 X S3 XX X XX X XXXX

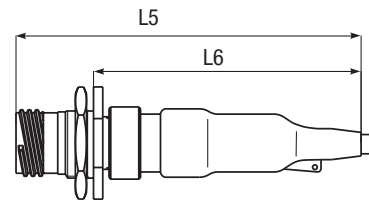
TVOP Jam Nut Receptacle with straight backshell and integrated plastic clamp

TVOP 07 X S4 XX X XX X XXXX



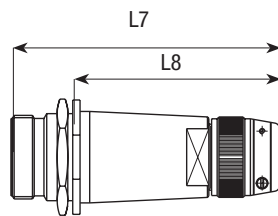
TVOP Jam Nut Receptacle with straight heatshrinkable backshell

TVOP 07 X H0 XX X XX X XXXX



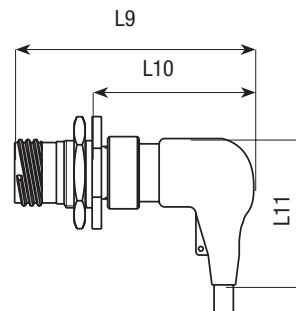
TVOP Jam Nut Receptacle with straight backshell and tightening jaws clamp

TVOP 07 X S5 XX X XX X XXXX



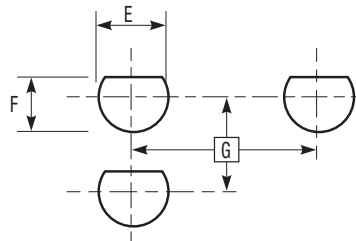
TVOP Jam Nut Receptacle with right angle heatshrinkable backshell

TVOP 07 X H9 XX X XX X XXXX



Panel Drilling for Jam Nut Receptacle

Panel Drilling
Jam nut receptacle
rear panel mounting



Overall dimensions

Shell Size																F		
MIL.DTL. 38999 Series III	Amphenol Socapex	D1	D2	øD3	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	øE Mini	+0 -0,25	G Mini
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
B	11	31.75	25.40	34.92	49.92	27.8	81.7	59.4	96.1	74	96.9	74.6	68.4	46.3	40.6	20.88	19.53	32.60
C	13	34.92	30.17	38.10	49.92	27.8	81.7	59.4	108.1	85.8	96.9	74.6	72.1	49.8	49.7	25.58	24.26	36.00
E	17	41.28	36.52	44.25	49.92	27.8	103.9	81.6	120.92	85.8	96.9	74.6	79.1	56.8	59.2	31.98	30.68	43.30

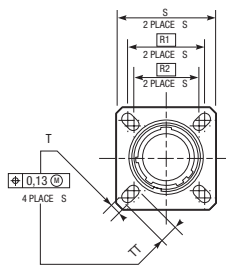


HOW TO ORDER TVOP JAM NUT RECEPTACLE

Series	TVOP	07	X	XX	XX	X	XX	X	XXXX
Shell type	_____								
07 : Jam nut receptacle	_____								
Shell finish	_____								
F : Aluminium, electroless nickel plated	_____								
W : Aluminium, olive drab cadmium plated	_____								
B : Bronze	_____								
Backshell	_____								
H0 : Straight heatshrinkable backshell without clamp	_____								
H9 : Right angle heatshrinkable backshell without clamp	_____								
R0 : Straight Backshell for pigtails	_____								
S3 : Straight backshell for multiway cable with metal integrated clamp	_____								
S4 : Straight backshell for multiway cable with plastic integrated clamp	_____								
S5 : Straight backshell for multiway cable with tightening jaws clamp	_____								
Shell size	Max Number of Channel	_____							
11	2	_____							
13	4	_____							
17	8	_____							
Type of ceramic ferrule	_____								
Multimode	Ceramic ferrule inner diameter	_____							
P : Physical Contact ferrule	7 : 127µm	_____							
Singlemode	Ceramic ferrule inner diameter	_____							
P : Physical Contact ferrule	6 : 126µm	_____							
A : Angle Physical Contact (high return loss)	_____								
Polarization	_____								
N : for standard	_____								
A, B, C, D, E : for special keying	_____								
Cable diameter	_____								
X055 : ø 5,5mm multiway cable (for backshell H0, H9, S3, S4, S5)	_____								
X015 : ø 1,5mm for pigtail (for backshell R0)	_____								

TVOP SQUARE FLANGE RECEPTACLE : TVOP 00

TVOP Square Flange Receptacle Front Face

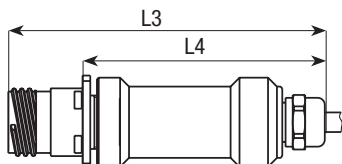


TVOP Square Flange Receptacle with straight backshell and integrated metal clamp

TVOP 00 X S3 XX X XX X XXXX

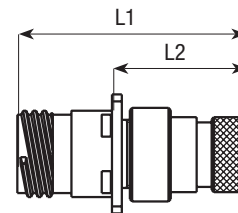
TVOP Square Flange Receptacle with straight backshell and integrated plastic clamp

TVOP 00 X S4 XX X XX X XXXX



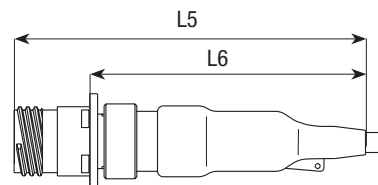
TVOP Square Flange Receptacle with backshell for pigtails

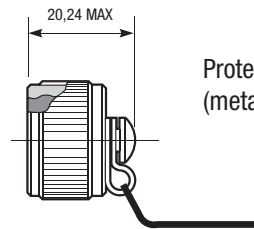
TVOP 00 X R0 XX X XX X XXXX



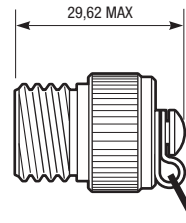
TVOP Square Flange Receptacle with straight heatshrinkable backshell

TVOP 00 X H0 XX X XX X XXXX

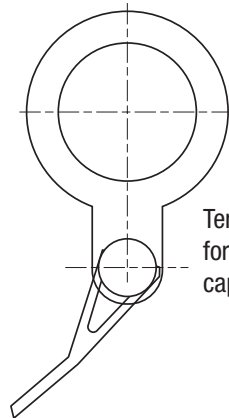




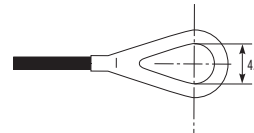
Protective cap for receptacle
(metallic chain or nylon cord)



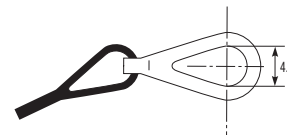
Protective cap for plug (metallic chain or nylon cord)



Termination of the chain or cord for jam nut receptacle protection caps (for shell type : 07)

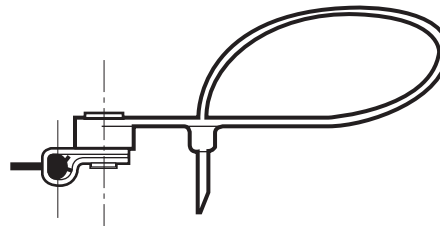


Termination of the cord for square flange receptacle protection caps (for shell type : 00)



Termination of the chain for square flange receptacle and plug protection caps (for shell type : 00,06)

termination of the cord for plugs protection cap (for shell type : 06)



Cord length for plugs : 160mm
Cord length for receptacle : 105mm
Chain length for plugs : 127mm
Chain length for receptacle : 152mm

HOW TO ORDER TVOP DUST CAPS

CAP Series	B	XX	X	TV	X	XX
Protective cap type EC : For square flange receptacle ER : For jam nut receptacle F : For plug						
Wire type N : Nylon cord Blank : Metallic chain						
Shell finish B : Bronze F : Electroless nickel plated, aluminium version W : Olive drab cadmium plated, aluminium version						
Corresponding connector shell size : 11, 13, 17						

TVOP patchcord

Requested information to order a TVOP patchcord

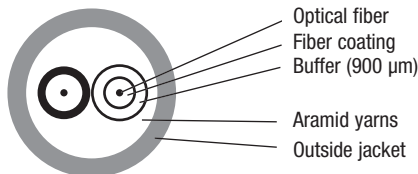
- Plug or Receptacle : define the P/N
- Type of fiber : 50/125, 62,5/125 or 9/125
- Patchcord length : ex. 10.5m
- Patchcord Configuration : plug/plug, plug/pigtail, plug/receptacle
receptacle/pigtail, receptacle/receptacle
- Drawing : please send us a drawing of your request
- Cable for plug : choose type of cable at the end of the catalogue

Tactical cables technical information

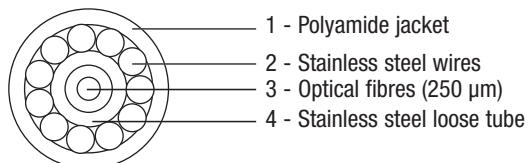
Company		OCC				NEXANS				SPECTRA STRIP	BRUGG		
Number of fibers		2	4	6	8	1	2-4	6	8	1 - 2 - 4 - 6 - 8	1	2	4
Cable diameter mm (in)		5 (0,2)	5,5 (0,22)	6,0 (0,24)	6,5 (0,26)	6 (0,24)	5,4 (0,21)	6,1 (0,24)	6,3 (0,25)	5,5 (0,22)	3,4 (0,13)	3,8 (0,15)	3,8 (0,15)
Cable weight kg/km (lb/1,000ft)		23 (15)	28 (19)	28 (19)	38 (26)	26 (18)	25 (17)	32 (22)	35 (24)	(2-4 core typically) 25 (17)	18 (12)	25 (17)	26 (17)
Reinforcing protection		aramid yarns				aramid yarns				aramid yarns	stainless-steel wires		
Outside jacket		polyurethan				polyurethan				spectraloy	polyamid		
Fiber minimum bandwidth	Multimode 850nm (MHz/km)	200 (62,5/125)				500 (50/125) 200 (62,5/125)				200 (50/125) 400 (62,5/125)	500		
	Multimode 1300nm (MHz/km)	500 (62,5/125)				800 (50/125) 500 (62,5/125)				400 (50/125) 600 (62,5/125)	800		
	Single mode 1310nm (GHz/km)	-				-				3,5	3,5		
	Single mode 1550nm (GHz/km)	-				-				18	18		
Fiber maximal attenuation	Multimode 850nm (dB/km)	3 (62,5/125)				3,5				3,5	2,7		
	Multimode 1300nm (dB/km)	1 (62,5/125)				1,5				1,5	0,8		
	Single mode 1310nm (dB/km)	-				0,42				0,45	0,36		
	Single mode 1550nm (dB/km)	-				0,28				0,3	0,25		
Temperature range	Storage	-70°C / +85°C (-94°F / +185°F)				-40°C / +70°C (-40°F / +158°F)				-60°C / +85°C (-76°F / +185°F)	-60°C / +85°C (-76°F / +185°F)		
	Operating	-55°C / +85°C (-67°F / +185°F)				-40°C / +70°C (-40°F / +158°F)				-55°C / +85°C (-67°F / +185°F)	-55°C / +85°C (-67°F / +185°F)		
Minimum bending radius mm (in)		8 X OD cable				60 (2,36)	50 (1,97)			10 X OD cable	30 (1,18)	35 (1,38)	35 (1,38)
Maximum tensile strength	Short term N (lbs.f)	1800 (405)	1800 (405)	1800 (405)	1800 (405)	(IEC 794 1E1) 2200 (495)				(2-4 core typically) (60- 1 part.3 cl.15.1) 2000 (450)	1000 (225)	2500 (562)	1600 (360)
	Operating N (lbs.f)	600 (135)	600 (135)	600 (135)	600 (135)	1300 (292)				(2-4 core typically) 2600	750 (169)	1800 (405)	1100 (247)
Crush resistance N/cm (lbs/in)		(EIA 455 41) 440 (251)				(IEC 794 1E3) 300 (171)				(2-4 core typically) (IEC 60794-1-1 &2) 1200 (685)	2500 (1428)	1200 (685)	1000 (571)
Impact resistance (1J impact)		(EIA 455 25) 200				(IEC 794 1E4) 100				100 min	100 min		
Torsion/torque		(TIA/EIA-455-104) 2000 cycles				(IEC 794 1E8) 30000 cycles				(2-4 core typically) (IEC 60794-1-1) 1000 cycles	10000 min	7000 min	7000 min

Technical information given by the supplier

Tactical cables with aramid yarn reinforcing protection



Tactical cable with stainless steel wires reinforcing protection



NORTH AMERICA

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Fax: 34-91-640-73-07

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Fax: 46-8-571-423-89

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Fax: 31-172-240-254

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Fax: 48-32-3484-202

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