

Contact Specifications

TX Series • MIL-DTL-38999 Series III Style Connectors

Wire & Crimp Contact Dimensions

Contact Size	Wire Range		Potential Drop (Millivolts)	Crimp Well Diameter	Min Crimp Well Depth	Wire Jacket Diameter Sealing Range		Contact Retention Min Axial Load Pounds (Newtons)
	AWG	Dia				Min	Max	
#22D	22, 24, 26, 28	.012-.025 (.32-.64)	<73	.035 (.89)	.141 (3.58)	.030 (.76)	.054 (1.37)	10 (44.5)
#20	20, 22, 24	.020-.032 (.51-.81)	<55	.047 (1.19)	.209 (5.31)	.040 (1.02)	.083 (2.11)	15 (66.7)
#16	16, 18, 20	.032-.050 (.81-1.29)	<49	.067 (1.70)	.209 (5.31)	.065 (1.65)	.109 (2.77)	25 (111.2)
#12	12, 14	.064-.080 (1.62-2.05)	<42	.100 (2.54)	.209 (5.31)	.097 (2.46)	.142 (3.61)	30 (133.4)

Dimensions are in inches (mm) unless otherwise noted.

Wire & Solder Contact Dimensions (Hermetic)

Contact Size	Wire Range		Potential Drop (Millivolts)	Solder Well Diameter	Min Solder Well Depth
	AWG	Dia			
#22D	22, 24, 26, 28	.012-.025 (.32-.64)	<85	.036 (.91)	.094 (2.39)
#20	20, 22, 24	.020-.032 (.51-.81)	<60	.044 (1.12)	.125 (3.18)
#16	16, 18, 20, 22	.025-.050 (.64-1.29)	<85	.078 (1.98)	.141 (3.58)
#12	12, 14	.064-.080 (1.62-2.05)	<82	.116 (2.95)	.141 (3.58)

Dimensions are in inches (mm) unless otherwise noted.

Current Rating By Contact Size & Wire Size

Wire Size (AWG)	Contact Size			
	#22D	#20	#16	#12
28	1.5A	-	-	-
26	2A	-	-	-
24	3A	3A	-	-
22	5A	5A	-	-
20	-	7.5A	7.5A	-
18	-	-	10A	-
16	-	-	13A	-
14	-	-	-	17A
12	-	-	-	23A

Test ratings only. A connector cannot withstand maximum current through all contacts continuously. Please note that the establishment of electrical safety factors is left entirely in the designer's hands, since he or she is in the best position to know what peak voltage, switching surges, transients, etc. can be expected in a particular circuit.

Contact Derating Specifications

Service Rating	Max Operating Voltage (Sea Level)		Test Voltage			
	AC (RMS)	DC	Sea Level AC (RMS)	50,000 ft AC (RMS)	70,000 ft AC (RMS)	110,000 ft AC (RMS)
M	400	500	1,300	550	350	200
N	300	450	1,000	400	260	200
I	600	850	1,800	600	400	200
II	900	1,250	2,300	800	500	200

Test ratings only. A connector cannot withstand maximum current through all contacts continuously. Please note that the establishment of electrical safety factors is left entirely in the designer's hands, since he or she is in the best position to know what peak voltage, switching surges, transients, etc. can be expected in a particular circuit.

Shielding Effectiveness

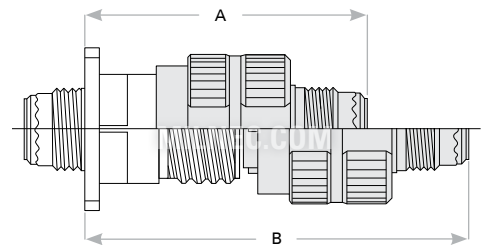
Freq Range (Mhz)	Attenuation Minimum (dB)
100	90
200	88
300	88
400	87
800	85
1,000	85
1,500	76
2,000	70
3,000	69
4,000	68
6,000	66
10,000	65

Effective over a range of 100 MHz to 10 GHz with a minimum 50 dB effectiveness at 10 GHz, in accordance with test method EIA-364-10.

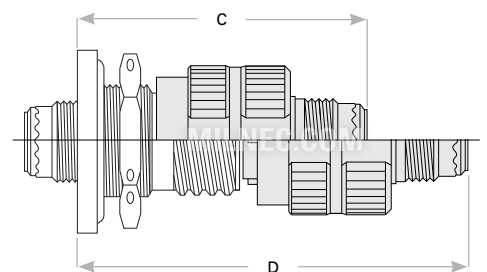
Mated Connector Dimensions

Shell Size	A Max	B Max	C Max	D Max
9	1.457 (37.0)	2.059 (52.3)	1.508 (38.3)	2.110 (53.6)
11	1.457 (37.0)	2.059 (52.3)	1.508 (38.3)	2.110 (53.6)
13	1.457 (37.0)	2.059 (52.3)	1.516 (38.5)	2.118 (53.8)
15	1.457 (37.0)	2.059 (52.3)	1.516 (38.5)	2.118 (53.8)
17	1.457 (37.0)	2.059 (52.3)	1.516 (38.5)	2.118 (53.8)
19	1.457 (37.0)	2.059 (52.3)	1.516 (38.5)	2.118 (53.8)
21	1.417 (36.0)	2.020 (51.3)	1.516 (38.5)	2.118 (53.8)
23	1.417 (36.0)	2.020 (51.3)	1.516 (38.5)	2.118 (53.8)
25	1.417 (36.0)	2.020 (51.3)	1.516 (38.5)	2.118 (53.8)

Dimensions are in inches (mm).



TX00 Wall Mount Receptacle & TX06 Plug



TX07 Jam Nut Receptacle & TX06 Plug

Rev. 2235

Contacts, Sealing Plugs, & Tooling

Contact Size	Contact Style	Part Number	Wire Size (AWG)	Wire Range (Dia)	Jacket Strip Length	Crimping Tool	Positioner	Insertion Tool	Extraction Tool
#22D	Standard Pin	TXPP22	22, 24, 26, 28	.012–.025 (.32–.64)	.157 (4.00)	TK201	TP209 (pins only)	TN801	TX802
	High-Cycle Pin	TXHP22							
	Standard Socket	TXSS22							
	High-Cycle Socket	TXHS22							
	Sealing Plug	TXSP22							
							No Tooling Required		
#20	Standard Pin	TXPP20	20, 22, 24	.020–.032 (.51–.81)	.197 (5.00)	TK101A	TP104 (Turret)	TN805	TX806
	High-Cycle Pin	TXHP20							
	Standard Socket	TXSS20							
	High-Cycle Socket	TXHS20							
	Sealing Plug	TXSP20							
							No Tooling Required		
#16	Standard Pin	TXPP16	16, 18, 20	.032–.050 (.81–1.29)	.236 (6.00)	TK101A	TP104 (Turret)	TN807	TX808
	High-Cycle Pin	TXHP16							
	Standard Socket	TXSS16							
	High-Cycle Socket	TXHS16							
	Sealing Plug	TXSP16							
							No Tooling Required		
#12	Standard Pin	TXPP12	12, 14	.064–.080 (1.62–2.05)	.236 (6.00)	TK101A	TP104 (Turret)	TN809	TX810
	High-Cycle Pin	TXHP12							
	Standard Socket	TXSS12							
	High-Cycle Socket	TXHS12							
	Sealing Plug	TXSP12							
							No Tooling Required		

Dimensions are in inches (mm) unless otherwise noted.

Thermocouple Contacts

Contact Size	Contact Style	Part Number	Wire Size (AWG)	Wire Range (Dia)	Jacket Strip Length	Crimping Tool	Positioner	Insertion Tool	Extraction Tool							
#22D Alumel	Pin	TXPA22	22, 24, 26, 28	.012–.025 (.32–.64)	.157 (4.00)	TK201	TP209	TN801	TX802							
	Socket	TXSA22														
#22D Chromel	Pin	TXPR22														
	Socket	TXSR22														
#22D Constantan	Pin	TXPK22														
	Socket	TXSK22														
#22D Iron	Pin	TXPE22														
	Socket	TXSE22														
#20 Alumel	Pin	TXPA20								20, 22, 24	.020–.032 (.51–.81)	.197 (5.00)	TK101A	TP104 (Turret)	TN805	TX806
	Socket	TXSA20														
#20 Chromel	Pin	TXPR20														
	Socket	TXSR20														
#20 Constantan	Pin	TXPK20														
	Socket	TXSK20														
#20 Iron	Pin	TXPE20														
	Socket	TXSE20														
#16 Alumel	Pin	TXPA16	16, 18, 20	.032–.050 (.81–1.29)	.236 (6.00)	TK101A	TN807	TN807	TX808							
	Socket	TXSA16														
#16 Chromel	Pin	TXPR16														
	Socket	TXSR16														
#16 Constantan	Pin	TXPK16														
	Socket	TXSK16														
#16 Iron	Pin	TXPE16														
	Socket	TXSE16														

Dimensions are in inches (mm) unless otherwise noted. For other thermocouple materials, including copper, contact your authorized distributor.

Rev. 1231.1

Coax & Twinax Contacts

TX Series • MIL-DTL-38999 Series III Style Connectors

Coax Contacts

Cable	Contact Size	Part Number		Crimping Tools		Positioners		Installation Tools	
		Pin	Socket	Inner	Outer	Inner	Outer	Insertion	Extraction
RG-178B/U RG-196A/U M17/093-RG178 M17/169-00001	#16	TXPX16-002	TXSX16-003		TK401	TP235	TP402	TN807	TX808
RG-161/U RG-174A/U RG-179B/U RG-187A/U RG-188A/U RG-316/U Haveg 8100207 Times (HS-179) AA3248 Teledyne 11299 Thermax 75-738-BCCWXE Tensolite 3088/L707YX-1 M17/119-RG174 M17/094-RG179 M17/113-RG316	#12	TXPX16-004	TXSX16-005		TK3101	TP234	TP3102	TN809	TX810
RG-180B/U RG-195A/U Raychem 9528A1318 Raychem 9527D1514-2L Microdot 293-3922 M17/095-RG180	#8	TXPX12-008	TXSX12-009	TK201					
M17/113-RG316 M17/094-RG179		TXPX12-010*	TXSX12-011*	TK992		TP1360	TP503		
RG-180B/U RG-195A/U Raychem 9527D1514-2L M17/095-RG180	#8	TXPX08-012	TXSX08-013	TK201	TK501	TP231	TP505	—	TX814
RG-400		TXPX08-102	TXSX08-101			TP210	TP545		
RG-161/U, RG-174A/U, RG-179B/U, RG-187A/U, RG-188A/U, RG-316/U, Haveg 8100207, Times (HS-179)AA3248, Teledyne 11299, T-Flex 405		TXPX08-103	TXSX08-104	TK201 or solder		TP231 [†] or solder	TP503	—	TX917

* Matched impedance when used with RG316 cable. † When inner contact is installed by crimping, TE134 expander tool must be used to assemble rear insulator over contact.

Twinax Contacts

Cable	Contact Size	Part Number		Crimping Tools		Positioners		Installation Tools	
		Pin	Socket	Inner	Outer	Inner	Outer	Insertion	Extraction
M17/176-00002	#8	TXPW08-002	TXSW08-003	TK201	TK501	TP231	TP505	—	TX2648

PC Tail Coax & Twinax Contacts

For added engineering flexibility in today's advanced electronic designs, Milnec can provide coax or twinax contacts with PC tails. Custom tail lengths and tail diameters enable engineers to bring high-speed transmission directly to PC board applications with improved signal integrity. Please consult an authorized distributor for lead time information and minimum quantity requirements for special order high-speed PC tail contacts.



Rev. 2235

Size #16 Fiber Optic Contacts

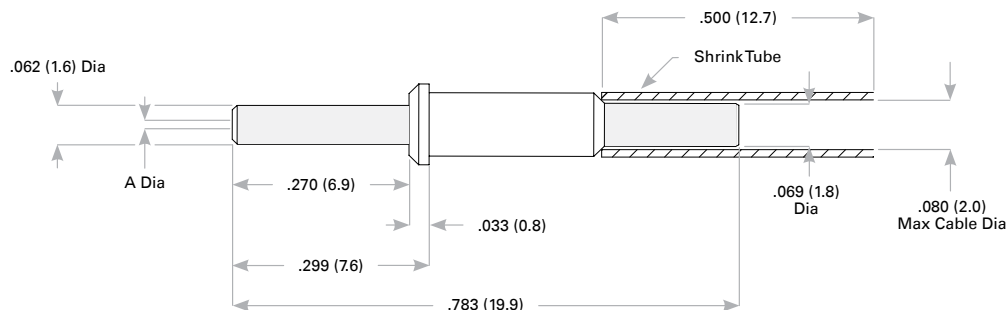
Pin Part Number	Socket Part Number	Fiber Size Core/Cladding	Mode	A Dia (Microns)	Tooling
TXPF-125S*	TXSF-125S*	9/125	Single	125.5	
TXPF-126S*	TXSF-126S*	9/125	Single	126	
TXPF-126M	TXSF-126M*	50/125 & 62.5/125	Multi	126	
TXPF-127M	TXSF-127M	50/125 & 62.5/125	Multi	127	
TXPF-142M	TXSF-142M	100/140	Multi	142	
TXPF-144M	TXSF-144M	100/140	Multi	144	
TXPF-145M*	TXSF-145M*	100/140	Multi	145	Insertion Tool
TXPF-156M*	TXSF-156M*	62.5/125/155 (Polyimide)	Multi	156	TN807
TXPF-157M*	TXSF-157M*	62.5/125/155 (Polyimide)	Multi	157	
TXPF-173M	TXSF-173M	100/140/172 (Polyimide)	Multi	173	Removal Tool
TXPF-175M*	TXSF-175M*	100/140/172 (Polyimide)	Multi	175	TX808
TXPF-231M*	TXSF-231M*	200/230	Multi	231	
TXPF-236M*	TXSF-236M*	200/233	Multi	236	
TXPF-286M*	TXSF-286M*	200/280	Multi	286	
TXPF-448M*	TXSF-448M*	400/440	Multi	448	
TXPF-533M*	TXSF-533M*	486/500	Multi	533	

* Special order item. Please consult an authorized distributor for lead time and minimum quantity requirements.

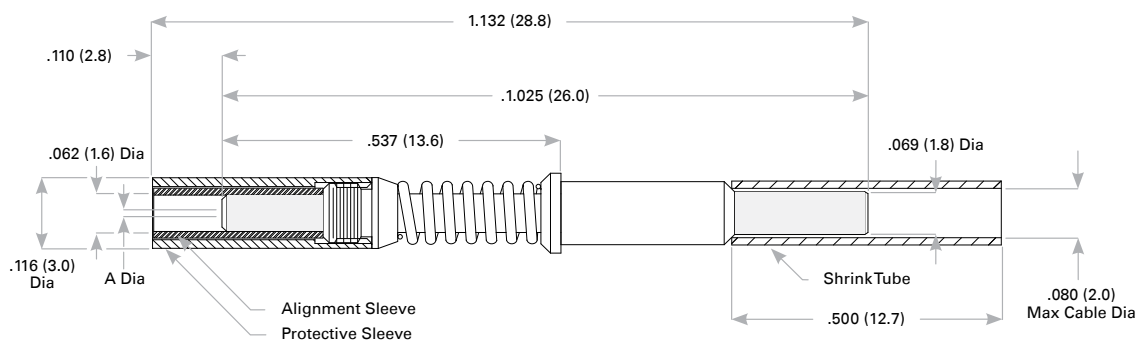


High-Performance Fiber Optic Contacts

Fiber optic termini are used in avionics, robotics, weapons systems, sensors, and other high-performance applications in which low data loss and reliable, repeatable performance is a necessity. These fiber optic termini can be used in any TX Series insert that accommodates standard #16 contacts.



Size 16 Fiber Optic Pin Termini



Size 16 Fiber Optic Socket Termini

PC Tail Contacts

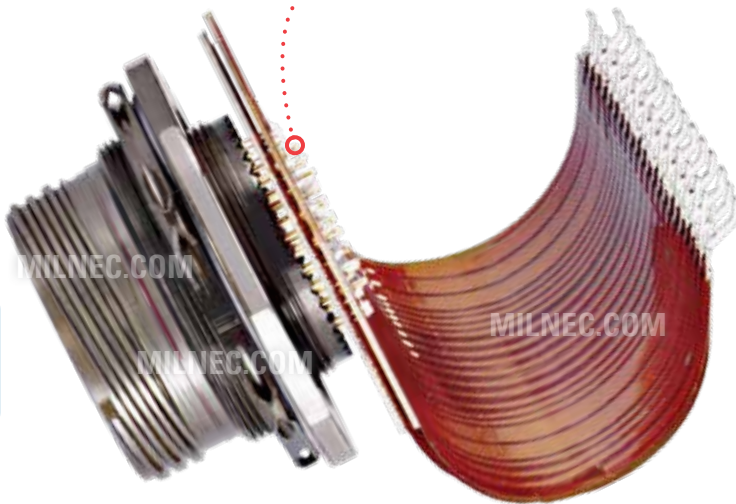
TX Series • MIL-DTL-38999 Series III Style Connectors

Introduction to PC Tail Contacts

PC tail contacts are used exclusively for connectors that are mounted directly to printed circuit boards or flex cable by a specialized contact with a long termination "tail" that protrudes behind the connector body. PC tail contacts offer a number of design advantages by permitting the use of ruggedized connectors mounted to sophisticated electronics without the use of pigtails or bulky terminal blocks. Direct termination of contacts to PC boards also increases signal integrity and improves overall system reliability.

PC tail contacts differ from one another by the tail diameter and length. The tail length is the portion that extends beyond the main body of the contact and protrudes from the rear of the connector shell. In cases where the tail length extends beyond a design's required minimum length, excess tail material can simply be trimmed with wire cutters after soldering and testing. Milnec also offers custom coax, twinax, or quadrax PC tail contacts to accommodate high-frequency contact requirements. ■

Get PC Tail Contacts Easily
Ordering connectors pre-loaded with PC tail contacts ready for termination to PC boards or flex cable has never been easier!

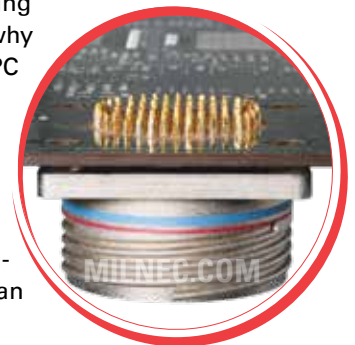


Jam Nuts for PC Tail Contact Applications

While PC tail contacts can be used in any shell style, we recommend the use of jam nut receptacles when using PC tail contacts for PC board applications. Jam nut receptacles are designed for rear mounting and enable simpler installation on the enclosure. Their single-hole mounting design also reduces the number of environmentally susceptible openings that must be made, while the integrated O-ring maintains the environmental integrity of the enclosure. Protective covers are highly recommended to provide environmental and EMI/RFI protection when connectors are unmated. Socket contacts (which are recessed in the insert) are recommended for use as PC tail contacts in order to avoid accidental electrostatic discharge to contacts attached to sensitive electronics.

Custom PC Tail Lengths & Dimensions

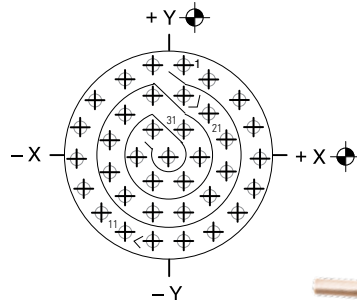
We realize that every engineering application is different, that's why we're able to provide custom PC tail contacts to fit any design. Options include custom tail lengths, shoulder extensions, or 90° angled configurations.



For applications requiring high-speed data transmission, we can also provide coax, twinax, and quadrax contacts with PC tails for termination directly to your PC board to provide the highest signal integrity. Please contact an authorized distributor for ordering assistance.

PC Tail Contact Placement Diagrams

Insert arrangement diagrams are available for the most popular inserts for PC tail contact applications. These diagrams provide precise hole locations for printed circuit board manufacturing via exact coordinates. Please contact your distributor for more information.



Custom PC Tail Contacts Available
PC tail contacts may be ordered with custom shoulder extensions, tail lengths, diameters, and angle configurations.



TX07 N 13-35 Y N - 02

- 1 **BASIC PART NUMBER**
 TX00 Wall mount receptacle
 TX07 Jam nut receptacle
- 2 **MATERIAL & FINISH**
 N Aluminum, electroless nickel
 W Aluminum, olive drab cadmium
 K Stainless steel, passivated (firewall)
- 3 **SHELL SIZE & INSERT ARRANGEMENT**
 See Insert Arrangement Selection table, p. B-19
- 4 **CONTACT STYLE**
 X PC tail pins
 Y PC tail sockets
- 5 **ALTERNATE KEYING**
 N NORMAL or A, B, C, D, E
- 6 **OPTIONAL ACCESSORY KIT (OMIT FOR NONE)**
 02 Protective cover + mounting gasket
 03 02 kit + mounting bracket + sealing screws



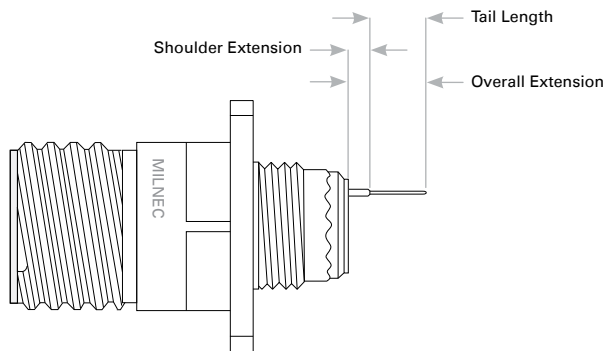
Order receptacles with PC tail contacts
 PC tail contacts are used to mount ruggedized connectors directly to printed circuit boards or flex cable. To include PC tail contacts with your connector, simply select the X or Y option for contact style. Custom PC Tail contact angles and sizes are available by special order. Insert arrangement diagrams are available with precise hole locations for PCB manufacturing.

Note: See part builder (p. B-17) for additional finish options.

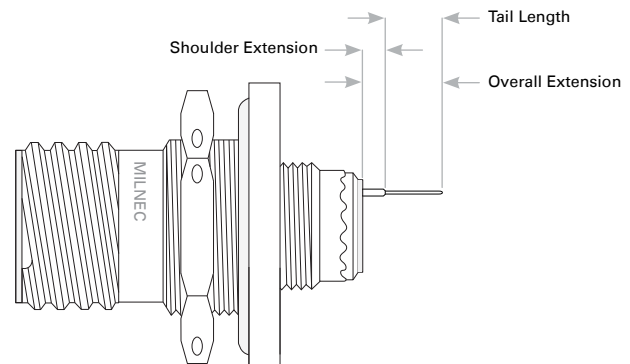
PC Tail Contacts

Contact Type	Part Number	Size	Tail Dia	Tail Length	TX00 Shoulder Extension		TX07 Shoulder Extension		TX00 Overall Extension [†]		TX07 Overall Extension [†]	
					Metal	Composite	Metal	Composite	Metal	Composite	Metal	Composite
Pin	TXPT22-001	#22D	.019 (.48)	.236 (5.99)	.084 (2.13)	.083 (2.11)	.083 (2.11)	.050 (1.27)	.320 (8.13)	.319 (8.10)	.319 (8.10)	.286 (7.26)
	TXPT20-002	#20	.025 (.63)									
	TXPT16-003	#16	.062 (1.57)									
	TXPT12-004	#12	.081 (2.06)									
Socket	TXST22-005	#22D	.019 (.48)	.236 (5.99)	.094 (2.39)	.097 (2.46)	.092 (2.34)	.050 (1.27)	.330 (8.38)	.333 (8.46)	.328 (8.33)	.286 (7.26)
	TXST20-006	#20	.025 (.63)									
	TXST16-007	#16	.062 (1.57)									
	TXST12-008	#12	.094 (2.39)									

Please contact your distributor for more contact sizes. For insertion and extraction tools, please see the Contacts, Sealing Plugs, & Tooling table, p. B-10. Dimensions are in inches (mm). [†] Overall extension ± 0.010 (0.3).



**TX00 Wall Mount Receptacle
 PC Tail Contact Extension**



**TX07 Jam Nut Receptacle
 PC Tail Contact Extension**