



DEUTSCH ACT MIL-DTL-38999 Series III Composite Connectors

The Next Generation of Durable, Lightweight,
Corrosion-Resistant Composite Connectors

DEUTSCH ACT MIL-DTL-38999 Series III Composite Connectors

Lightweight, Corrosion-Resistant, High-Performance Composite Connectors



LIGHTWEIGHT COMPOSITE

- Up to 40% lighter than aluminum
- Up to 70% lighter than stainless steel
- Corrosion resistant – withstands 2000 hours of salt spray

HIGH PERFORMANCE

- -65°C to +200°C temperature range
- 1500 mating cycles
- Over 50 contact arrangements available

RELIABLE

- Self-locking threaded coupling
- Robust ACME threads help decrease chance of damage
- 100% scoop proof
- Contact retention system provides excellent contact retention under severe vibration

EMI PROTECTED

- Grounding fingers for excellent EMI protection
- Connector is grounded when the shells meet, even before the contacts are engaged
- Trapezoidal thread for excellent shell-to-shell continuity

The DEUTSCH ACT MIL-DTL-38999 Series III high-performance composite connectors from TE Connectivity (TE) offer high-density contact arrangements in a miniature composite circular connector.

Weight-Saving Reliability

Composite connectors are significantly lighter than their metal counterparts, while presenting a robust interconnection platform. Their reliability includes exceptional corrosion resistance, as evidenced by their ability to withstand 2000 hours of salt spray.

A Legacy of Rugged Reliability

Originally designed as military and aerospace components, ACT Series connectors are now being used in many applications requiring extremely reliable interconnections. These connectors are quick mating, environmentally sealed, triple-lead threaded, have a self-locking coupling, and are EMI/RFI shielded.

Maximum Flexibility for Exceptional Performance

ACT Series connectors are available in 3 shell styles, 2 plating options, 6 shell clockings, over 50 different insert arrangements supporting size 23, 22, 20, 16, 12, 10, and 8 contacts for power and signal, as well as coax and twinax contacts.

High-reliability ACT Series connectors feature a scoop-proof design for easy, secure mating, and a threaded coupling for excellent vibration resistance. These lightweight, rugged, environmentally sealed connectors survive the harsh environments of commercial and military aerospace, ground defense, and marine applications.

TE Components . . . TE Technology . . . TE Know-how . . .

AMP | AGASTAT | CII | HARTMAN | KILOVAC | MICRODOT | NANONICS | POLAMCO | Raychem | Rochester | DEUTSCH
SEACON Phoenix | LL ROWE | Phoenix Optix | AFP | SEACON

Get your product to market faster with a smarter, better solution.



Specifications

MATERIALS

- **Shell:** Composite
- **Plating:**
Olive drab cadmium
Electroless nickel
- **Contacts:** Gold-plated copper alloy
- **Insert:** Thermoplastic and fluorinated silicone elastomer
- **EMI Spring Fingers:** Beryllium copper
- **O-Ring:** Fluorinated silicone elastomer

ELECTRICAL

- **Shell-to-Shell Conductivity:**
1.0 mV (nickel finish)
2.5 mV (cadmium finish)
- **Shielding Effectiveness:** >90 dB at 100 MHz,
>65 dB through 10 GHz

MECHANICAL/ENVIRONMENTAL

- **Sine Vibration:** Up to 60 g for 12 hours each in x, y, and z axes
- **Random Vibration:** Up to 41.7 g for 16 hr. at 175° C
Up to 50 g for 16 hr. at ambient temperature

- **Shock:** 300 g, 3 ms in the 3 axes

- **Durability:** 1500 mating cycles

• Contact Retention:

Size 23: 44 N (10 lb.)
Size 22D: 44 N (10 lb.)
Size 20: 67 N (15 lb.)
Size 16: 111 N (25 lb.)
Size 12: 111 N (25 lb.)
Size 10: 111 N (25 lb.)
Size 8: 111 N (25 lb.)

• Temperature Range:

-65°C to +200°C (Nickel plated)
-65°C to +175°C (Cadmium plated)

• Fluid Resistance:

Fluid immersion per EIA 364.10, including resistance to
MIL-PRF-5606: Hydraulic fluid
MIL-DTL-83133: JP-8 aviation fuel
MIL-PRF-7808: Lubricating oil
MIL-PRF-23699: Lubricating oil
MIL-A-8243: Deicing/defrosting fluid
MIL-C-25769: Aircraft cleaning compound
MIL-PRF-87937: Aircraft cleaning compound
MIL-G-3056: Gasoline

- **Salt Spray:** 2000 hours

Contact Size	Test Current (A)	Voltage Drop (mV)
23	3	73
22D	5	73
20	7.5	55
16	13	50
12	23	42
10	33	34
8	46	26

Service Rating	Suggested Operating Voltage		Test Voltage at Altitude		
	Sea Level		50,000 Ft.	70,000 Ft.	100,000 Ft.
M	1300		550	350	200
I	1800		600	400	200
II	2300		800	500	200

Thread Sizes

Shell Size	Accessory Thread (6g 0.100R)	Mating Thread (0.1P-0.3L)	Jam Nut Thread (6g 0.100R)
9	M12 x 1.0	0.6250	M17 x 1.0
11	M15 x 1.0	0.7500	M20 x 1.0
13	M18 x 1.0	0.8750	M25 x 1.0
15	M22 x 1.0	1.0000	M28 x 1.0
17	M25 x 1.0	1.1875	M32 x 1.0
19	M28 x 1.0	1.2500	M35 x 1.0
21	M31 x 1.0	1.3750	M38 x 1.0
23	M34 x 1.0	1.5000	M41 x 1.0
25	M37 x 1.0	1.6250	M44 x 1.0



Insert Arrangements

Insert	Contact Size/Quantity											Inactive: Superseded by
	8 Twinax	8 Coax	8 Power	12 Twinax	12 Coax	10	12	16	20	22D	23	
A07										7		
A23											9	
A35										6		
A98									3			
B02								2				
B04									4			
B05									5			
B23											19	
B35										13		
B98									6			
B99									7			
C04								4				
C08									8			
C23											32	
C35										22		
C98									10			
D05								5				
D15								1	14			
D18									18			
D19									19			
D23											55	
D26								2		24		
D35										37		
D97								4	8			
E02	1									38		17-03
E03	1									38		
E06							6					
E08								8				
E11				2	1				8			
E19								4	11	4		
E20							4			16		
E22	2						2					
E23											73	
E24			2							22		
E26									26			
E35										55		
E99								2	21			
F11								11				
F18	4									14		19-19
F19	4									14		
E23											88	
F28								2	26			

Blue shaded entries are not Mil Spec. Green shading indicates high-density inserts.



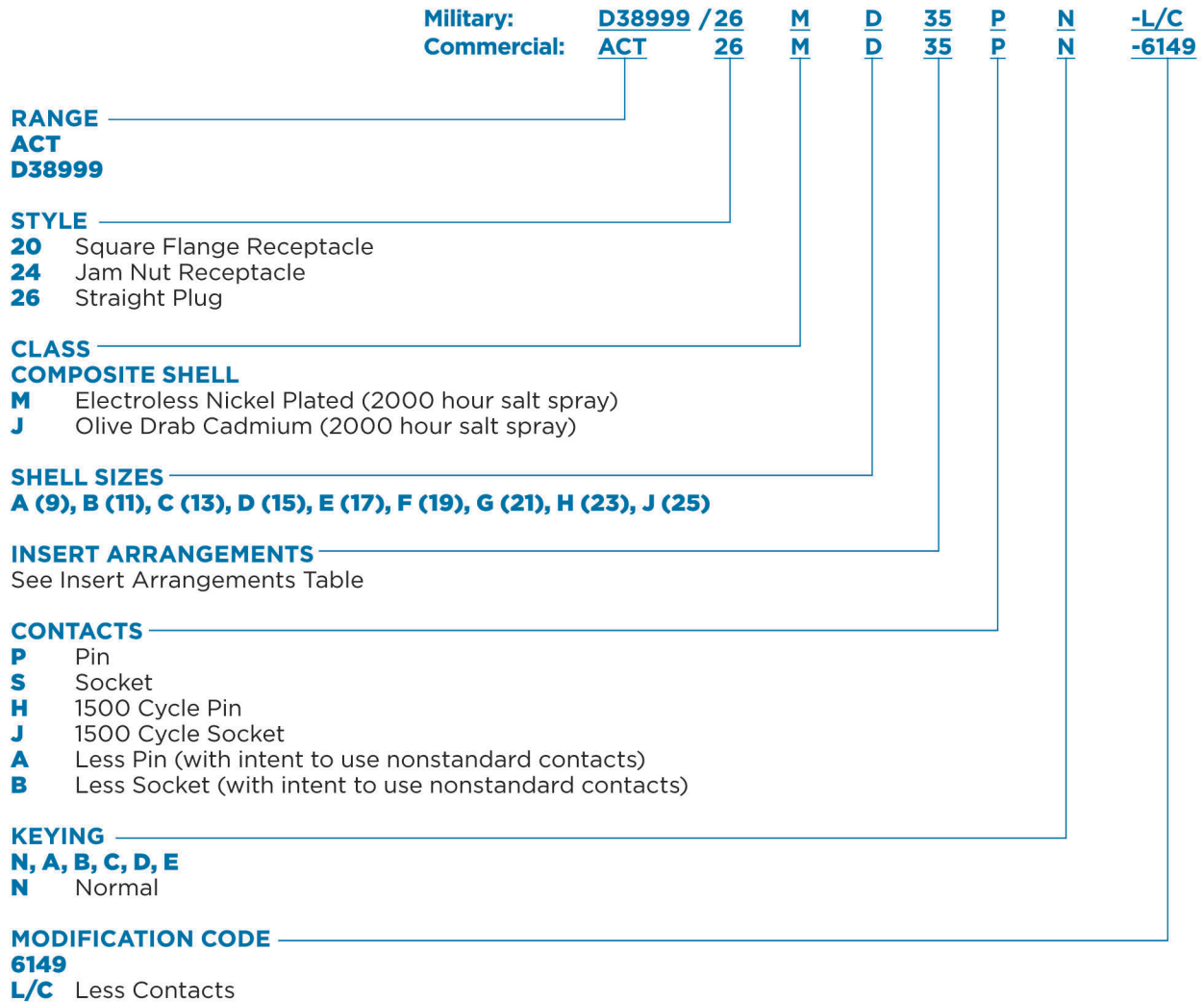
Insert Arrangements

Insert	Contact Size/Quantity											Inactive: Superseded by
	8 Twinax	8 Coax	8 Power	12 Twinax	12 Coax	10	12	16	20	22D	23	
F32									32			
F35										66		
G11							11					
G16								16				
G20	2								18			
G23											121	
G35										79		
G39								2	37			
G41									41			
G48			4									
G75	4											21-76
G76	4											
H06	6											
H21								21				
H23											151	
H35										100		
H53									53			
H54							4	9		40		
H55									55			
H63							4	4		49		
J04								8	48			
J07	2									97		25-09
J08	8											25-10
J09	2									97		
J10	8											
J11						9			2			
J17	6									36		
J19							19					
J20	3				4			13	10			25-21
J21	3				4			13	10			
J23											187	
J24							12	12				
J29								29				
J35										128		
J37								37				
J43								20	23			
J46		2						4	40			25-47
J47		2						4	40			
J61									61			
J90	2							4	40			25-91
J91	2							4	40			

Blue shaded entries are not Mil Spec. Green shading indicates high-density inserts.

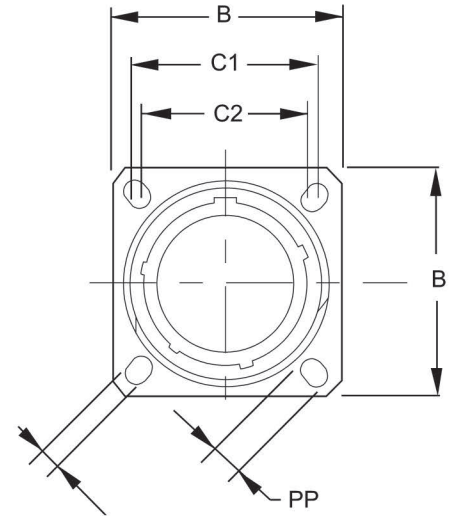
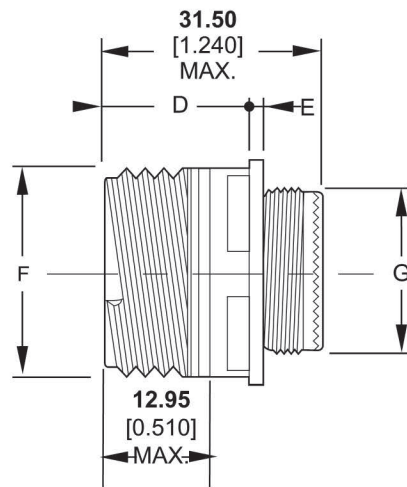


Typical Part Numbering System





Square Flange Backshell Type 20

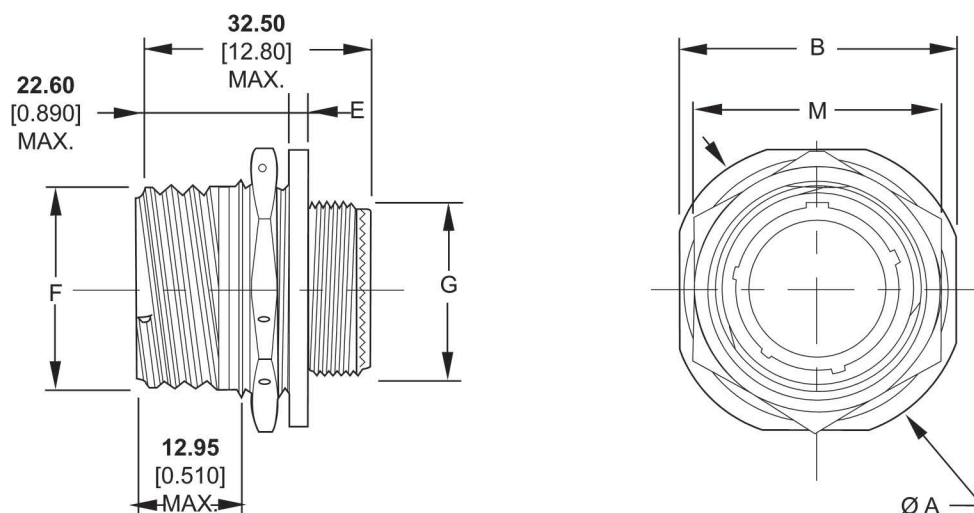


Shell Size	B	C1	C2	D Max.	E Max.	F	G	P	PP	Mass (g)
09	23.80 0.937	18.26 0.719	15.09 0.594	20.90 0.823	2.50 0.098	15.75 0.620	11.90 0.469	3.25 0.128	5.49 0.216	9
11	26.20 1.031	20.62 0.812	18.26 0.719	20.90 0.823	2.50 0.098	18.90 0.744	14.90 0.587	3.25 0.128	4.93 0.194	11
13	28.60 1.126	23.01 0.906	20.62 0.812	20.90 0.823	2.50 0.098	22.10 0.870	17.90 0.705	3.25 0.128	4.93 0.194	14
15	31.00 1.220	24.61 0.969	23.01 0.906	20.90 0.823	2.50 0.098	25.25 0.994	21.90 0.862	3.25 0.128	4.93 0.194	18
17	33.30 1.311	26.97 1.062	24.61 0.969	20.90 0.823	2.50 0.098	29.95 1.179	24.90 0.980	3.25 0.128	4.93 0.194	23
19	36.50 1.437	29.36 1.156	26.97 1.062	20.90 0.823	2.50 0.098	31.55 1.242	27.90 1.098	3.25 0.128	4.93 0.194	26
21	39.70 1.563	31.75 1.250	29.36 1.156	20.10 0.791	3.20 0.126	34.70 1.366	30.90 1.217	3.25 0.128	4.93 0.194	31
23	42.90 1.689	34.93 1.375	31.75 1.250	20.10 0.791	3.20 0.126	37.90 1.492	33.90 1.335	3.91 0.154	6.15 0.242	36
25	46.00 1.811	38.10 1.500	34.93 1.375	20.10 0.791	3.20 0.126	41.10 1.618	36.90 1.453	3.91 0.154	6.15 0.242	43

Millimeters Inches



Jam Nut Receptacle Type 24

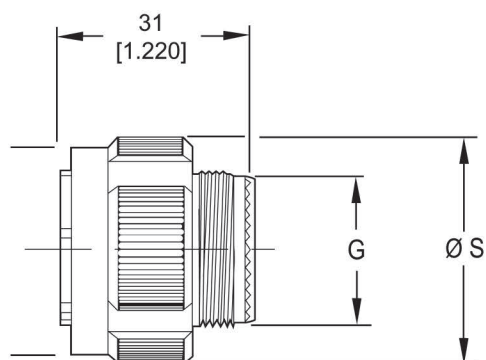


Shell Size	A	B	E Max.	F	G	M Max.	Mass (g)
09	30.20 1.189	27.00 1.063	2.20 0.087	15.75 0.620	11.90 0.469	24.00 0.945	11
11	34.90 1.374	31.80 1.252	2.20 0.087	18.90 0.744	14.90 0.587	27.00 1.063	14
13	38.10 1.500	34.90 1.374	2.20 0.087	22.10 0.870	17.90 0.705	32.00 1.260	18
15	41.30 1.626	38.10 1.500	2.20 0.087	25.25 0.994	21.90 0.862	36.00 1.417	23
17	44.50 1.752	41.30 1.626	2.20 0.087	29.95 1.179	24.90 0.980	37.00 1.457	29
19	49.20 1.937	46.00 1.811	3.00 0.118	31.55 1.242	27.90 1.098	41.00 1.614	35
21	52.40 2.063	49.20 1.937	3.00 0.118	34.70 1.366	30.90 1.217	46.00 1.811	38
23	55.60 2.189	52.40 2.063	3.00 0.118	37.90 1.492	33.90 1.335	50.00 1.969	46
25	58.70 2.311	55.60 2.189	3.00 0.118	41.10 1.618	36.90 1.453	51.23 2.017	55

Millimeters Inches



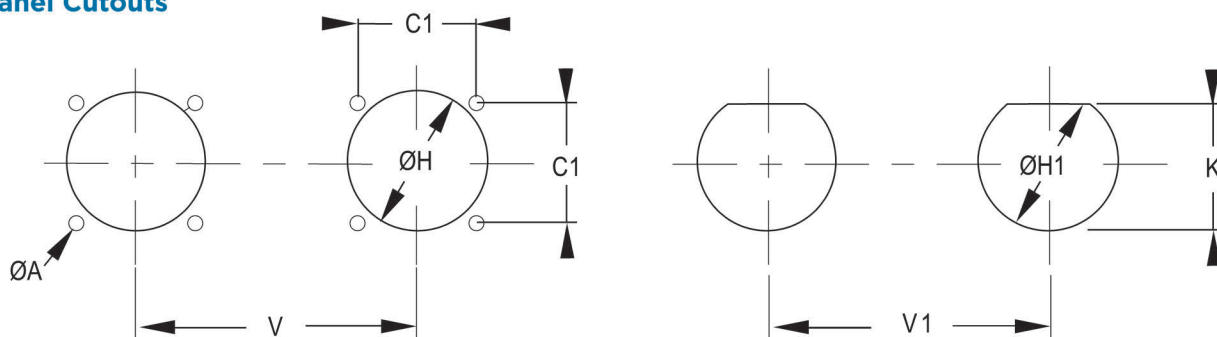
Plug Type 26



Shell Size	F Max.	G	S Max.	Mass (g)
09	18.40 0.724	11.90 0.469	21.80 0.858	9
11	21.10 0.831	14.90 0.587	25.00 0.984	13
13	25.40 1.000	17.90 0.705	29.40 1.157	18
15	28.70 1.130	21.90 0.862	32.50 1.280	23
17	32.20 1.268	24.90 0.980	35.70 1.406	25
19	34.90 1.374	27.90 1.098	38.50 1.516	32
21	38.10 1.500	30.90 1.217	41.70 1.642	35
23	41.10 1.618	33.90 1.335	44.90 1.768	41
25	44.30 1.744	36.90 1.453	48.00 1.890	48

Millimeters Inches

Recommended Panel Cutouts



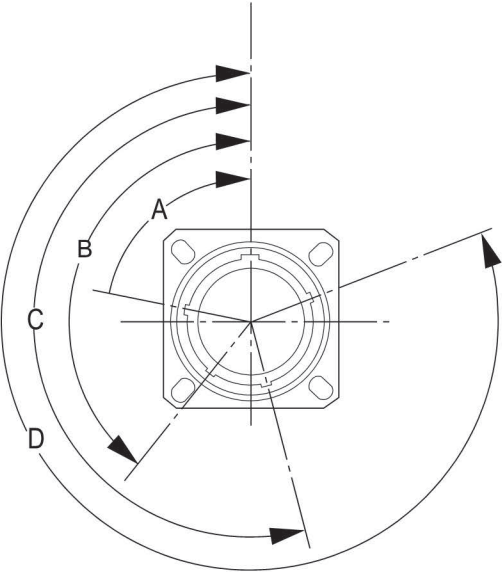
Shell Size	A	C1	H Min.		H1 Max.	K Max.	V Min.	V1 Min.
			Front	Rear				
9	3.25 0.128	18.26 0.719	13.11 0.516	16.66 0.656	17.78 0.700	16.70 0.657	25.58 1.007	20.20 1.189
11		20.62 0.812	15.08 0.594	22.22 0.875	20.88 0.822	19.53 0.769	27.00 1.063	32.60 1.283
13		23.01 0.906	19.05 0.750	23.42 0.922	25.58 1.007	24.26 0.995	30.20 1.189	36.00 1.417
15		24.61 0.969	23.01 0.906	26.59 1.047	28.80 1.134	27.53 1.084	33.30 1.331	39.60 1.559
17		26.97 1.062	25.81 1.106	30.96 1.219	31.98 1.259	30.68 1.208	36.50 1.437	43.30 1.705
19		29.36 1.156	28.98 1.141	32.94 1.297	35.15 1.384	33.86 1.333	39.30 1.547	47.00 1.850
21		31.75 1.250	32.16 1.266	36.12 1.422	38.28 1.507	37.06 1.459	42.50 1.673	50.60 1.992
23	3.91 0.154	34.93 1.375	34.93 1.375	39.29 1.547	41.50 1.634	40.01 1.575	45.70 1.799	54.20 2.134
25		38.10 1.500	37.69 1.484	42.47 1.672	44.68 1.759	43.41 1.709	48.80 1.921	59.70 2.350

Millimeters Inches



Keying

(Viewed from Mating Face of the Receptacle Connector)

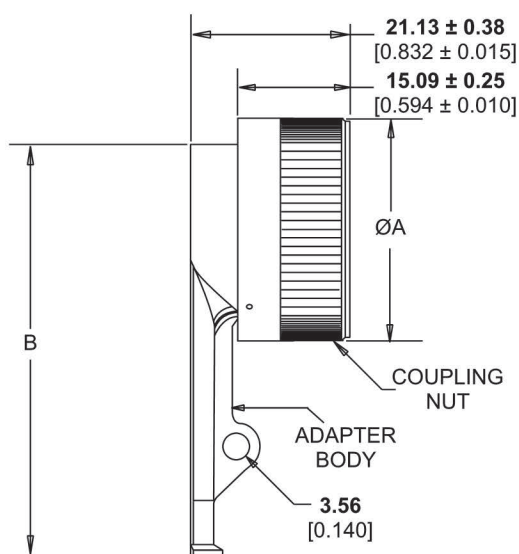
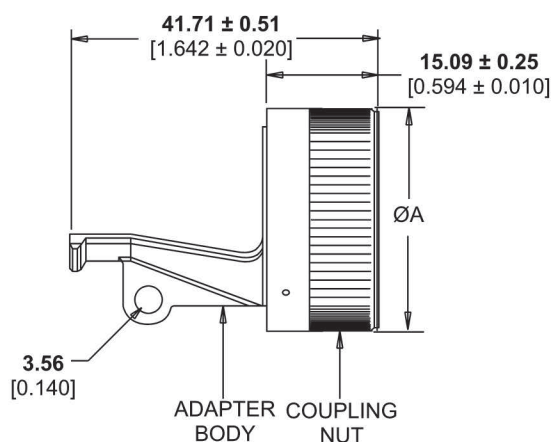


Shell Size	Key Position	Polarization (Degrees)			
		A	B	C	D
09	N	105	140	215	265
	A	102	132	248	320
	B	80	118	230	312
	C	35	140	205	275
	D	64	155	234	304
	E	91	131	197	240
11, 13, 15	N	95	141	208	236
	A	113	156	182	292
	B	90	145	195	252
	C	53	156	220	255
	D	119	146	176	298
	E	51	141	184	242
17, 19, 21, 23, 25	N	80	142	196	293
	A	135	170	200	310
	B	49	169	200	244
	C	66	140	200	257
	D	62	145	180	280
	E	79	153	197	272



ACT00 Strain-Relief Backshells

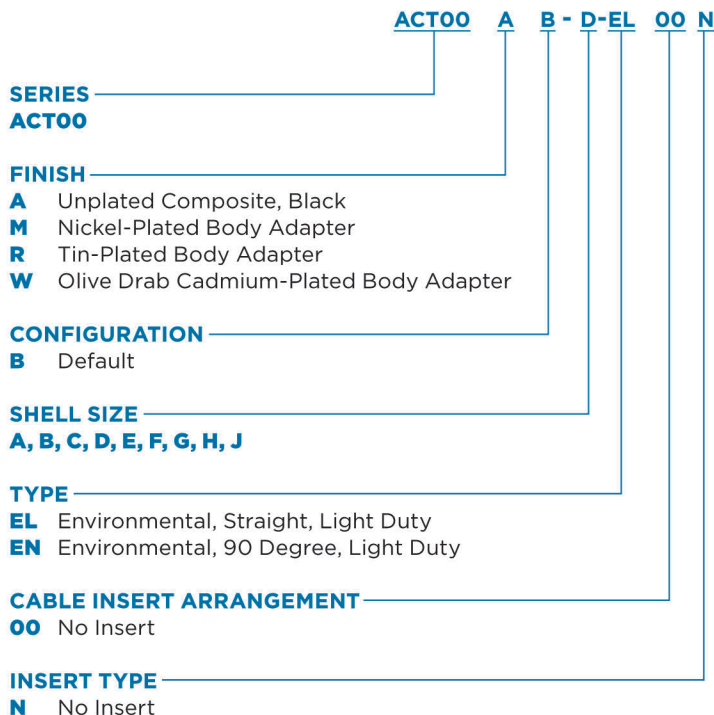
ACT00 strain-relief backshells offer a composite body to provide a simple, lightweight strain relief for cable uses in light-duty applications. Cable can be secured to the body adapter with a tie wrap. The body adapters are available with various conductive platings to allow grounding, while a secondary grommet provides wire sealing. The adapters are available with inserts to match the insert arrangement of the connector on which it is used.



Recommended Torque

Shell Sizes A through E: 20 – 30 in.-lbs.
Shell Sizes A through E: 35 – 45 in.-lbs.

Typical Part Numbering System



Shell Size	ØA ±0.15 (0.006)	B ±0.80 (0.031)	Strength Bending Moment, Min. (kg, lb.)
9 (A)	0.650 0.026	1.948 0.077	11 25
11 (B)	0.775 0.031	2.010 0.079	11 25
13 (C)	0.905 0.036	2.075 0.082	11 25
15 (D)	1.030 0.041	2.135 0.084	22 50
17 (E)	1.160 0.046	2.198 0.087	22 50
19 (F)	1.270 0.050	2.258 0.089	22 50
21 (G)	1.400 0.055	2.320 0.091	34 75
23 (H)	1.525 0.060	2.383 0.094	34 75
25 (J)	1.655 0.065	2.445 0.096	45 100

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Consult TE for the latest dimensions and design specifications.

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