

# **Mil-Spec Connectors & Accessories**



## **DEUTSCH ECD**

### **Defense / Aerospace Operations . . .**

*is the world's premier manufacturer of electrical interconnection devices for use in defense, aerospace, and commercial applications. Whether you need an interconnection device for a commercial or military aircraft, missile, tank, truck transmission or a host of other applications, Deutsch has the solution you're looking for.*

**Deutsch ECD Defense Aerospace Operations**

5733 W. Whittier Ave., Hemet CA (USA) 92545  
Phone 909/765-2200 • FAX 909/922-1544

# MIL-C-38999 Series III (Composite)

## ACT Highlights

DEUTSCH ACT SERIES

The Deutsch ACT is a high performance composite connector qualified to MIL-C-38999. What Deutsch Defense/Aerospace does better than anyone else is make wire termination devices for demanding applications. Deutsch utilized its unprecedented achievements in the area of defense/aerospace composite technology, enabling us to design and produce the latest version of MIL-C-38999 connectors.

The superior design of the ACT deliberately took into consideration the connector, its contacts, and the respective strain reliefs to favorably influence intra-system life-cycle performance and costs.

### **Performance**

The total performance of the ACT connector is matched by individual components within the system. For example, the use of composite materials has increased the durability of the connector housing and coupling mechanism to 1500 cycles. Deutsch developed an extended life MIL-C-39029 contact to meet the increased performance requirements of today's systems.

### **Superior corrosion resistance**

The ACT eliminates the largest contributing factor in advanced systems malfunction... corrosion, which is the main cause of mechanical, electrical, and electromagnetic connector degradation. Electromotive force differentials between many dissimilar metals found in connectors and accessories produce galvanic action. The ACT eliminates these dissimilar metals, resulting in an interconnection system that withstands over 2000 hours of salt spray.

### **EMI shielding effectiveness**

Meets and exceeds the requirements of MIL-C-38999, paragraph 3.3.1.

### **Fluid immersion**

Meets all the requirements of MIL-C-38999, paragraph 3.33.

### **Temperature**

The metal surface will not delaminate from the composite material even after extreme temperature excursions. The ACT meets all requirements of MIL-C-38999, paragraph 3.8.

### **Magnetic permeability**

The magnetic permeability of the fully assembled ACT connector is less than  $2.0 \mu$ , meeting all the requirements of MIL-C-38999, paragraph 3.3.4.

### **Materials**

All the materials used in the shell and inserts in the ACT are in accordance with MIL-C-38999, paragraph 3.3. The contacts are in accordance with MIL-C-39029, paragraph 3.3.

### **Finish**

Meets all the requirements of MIL-C-38999, paragraph 3.4.8.

### **Insulation resistance**

Meets all the requirements of MIL-C-38999, paragraph 3.13.

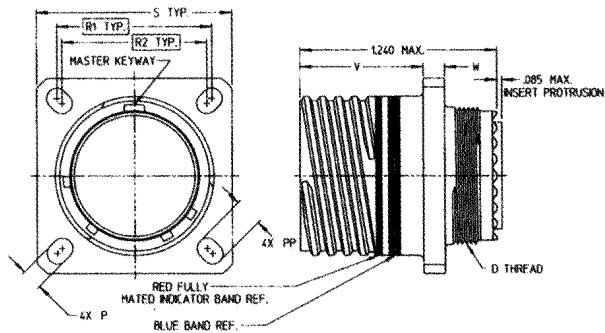
### **Dielectric withstanding voltage**

Meets all the requirements of MIL-C-38999, paragraph 3.14.



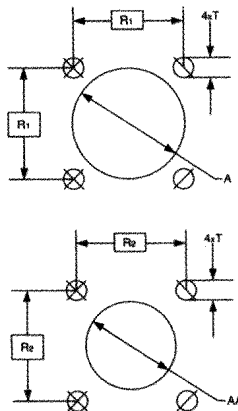
# The Best of MIL-C-38999

## Square flange receptacle\*



| MILITARY PART NUMBERS | DEUTSCH PART NO. | SHELL SIZE | D THREAD          | P+.004<br>-.002 | PP+.004<br>-.002 | R1    | R2    | S.010 | Y MIN | W MAX. |
|-----------------------|------------------|------------|-------------------|-----------------|------------------|-------|-------|-------|-------|--------|
| D38999/20*A****       | ACT 90*A****     | A (9)      | M12X1.0-8g 0.100R | .128            | .216             | .719  | .594  | .937  | .768  | .144   |
| D38999/20*B****       | ACT 90*B****     | B (11)     | M15X1.0-8g 0.100R | .128            | .194             | .812  | .719  | 1.031 | .768  | .144   |
| D38999/20*C****       | ACT 90*C****     | C (13)     | M18X1.0-8g 0.100R | .128            | .194             | .906  | .812  | 1.128 | .768  | .144   |
| D38999/20*D****       | ACT 90*D****     | D (15)     | M22X1.0-8g 0.100R | .128            | .173             | .969  | .906  | 1.220 | .768  | .144   |
| D38999/20*E****       | ACT 90*E****     | E (17)     | M25X1.0-8g 0.100R | .128            | .194             | 1.062 | .969  | 1.311 | .768  | .144   |
| D38999/20*F****       | ACT 90*F****     | F (19)     | M28X1.0-8g 0.100R | .128            | .194             | 1.156 | 1.062 | 1.437 | .768  | .144   |
| D38999/20*G****       | ACT 90*G****     | G (21)     | M31X1.0-8g 0.100R | .128            | .194             | 1.250 | 1.156 | 1.563 | .736  | .171   |
| D38999/20*H****       | ACT 90*H****     | H (23)     | M34X1.0-8g 0.100R | .154            | .242             | 1.375 | 1.250 | 1.689 | .736  | .171   |
| D38999/20*J****       | ACT 90*J****     | J (25)     | M37X1.0-8g 0.100R | .154            | .242             | 1.500 | 1.375 | 1.811 | .736  | .171   |

## Mounting cutouts



### Back Panel Mounting

Max (R1) distance between mounting screws

### Front Paneling Mounting

Max (R2) distance between mounting screws

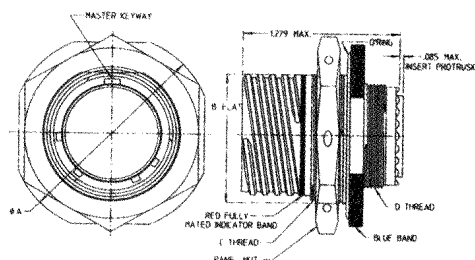
| SHELL SIZE | A DIS. MIN.   | AA DIS. MIN.  | R1            | R2            | T DIA. ±.13 |
|------------|---------------|---------------|---------------|---------------|-------------|
| A (9)      | 18.68 (.659)  | 13.11 (.516)  | 18.26 (.719)  | 15.09 (.594)  | 3.25 (.128) |
| B (11)     | 20.22 (.795)  | 15.88 (.625)  | 20.62 (.812)  | 18.26 (.719)  | 3.25 (.128) |
| C (13)     | 23.42 (.922)  | 19.05 (.750)  | 23.01 (.906)  | 20.62 (.812)  | 3.25 (.128) |
| D (15)     | 26.59 (1.047) | 23.01 (.906)  | 24.61 (.969)  | 23.01 (.906)  | 3.25 (.128) |
| E (17)     | 30.96 (1.219) | 25.81 (1.018) | 26.97 (1.062) | 24.61 (.969)  | 3.25 (.128) |
| F (19)     | 32.94 (1.297) | 28.95 (1.141) | 29.36 (1.156) | 26.97 (1.062) | 3.25 (.128) |
| G (21)     | 36.12 (1.442) | 32.16 (1.266) | 31.75 (1.250) | 29.36 (1.156) | 3.25 (.128) |
| H (23)     | 39.29 (1.547) | 34.93 (1.375) | 34.93 (1.375) | 31.75 (1.250) | 3.91 (.154) |
| J (25)     | 42.47 (1.672) | 37.69 (1.485) | 38.10 (1.500) | 34.93 (1.375) | 3.91 (.150) |

### Notes:

- Dimensions are in millimeters. Inch equivalents are in parentheses (given for general information only).
- R2 dimension may be substituted for mounting screw locations (R1) or front mount cutouts.
- \* QPL listing will be provided on request.



Jam nut receptacle\*

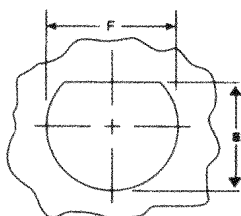


| MILITARY PART NUMBERS | DEUTSCH PART NO. | SHELL SIZE | A Ø ±.011 | B ±.005 | C THREAD          | D THREAD          |
|-----------------------|------------------|------------|-----------|---------|-------------------|-------------------|
| D38999/24*A****       | ACT 94*A****     | A (9)      | 1.189     | .650    | M17X1.0-6g 0.100R | M12X1.0-6g 0.100R |
| D38999/24*B****       | ACT 94*B****     | B (11)     | 1.374     | .750    | M20X1.0-6g 0.100R | M15X1.0-6g 0.100R |
| D38999/24*C****       | ACT 94*C****     | C (13)     | 1.500     | .937    | M25X1.0-6g 0.100R | M18X1.0-6g 0.100R |
| D38999/24*D****       | ACT 94*D****     | D (15)     | 1.626     | 1.061   | M28X1.0-6g 0.100R | M22X1.0-6g 0.100R |
| D38999/24*E****       | ACT 94*E****     | E (17)     | 1.752     | 1.186   | M32X1.0-6g 0.100R | M25X1.0-6g 0.100R |
| D38999/24*F****       | ACT 94*F****     | F (19)     | 1.937     | 1.311   | M35X1.0-6g 0.100R | M28X1.0-6g 0.100R |
| D38999/24*G****       | ACT 94*G****     | G (21)     | 2.063     | 1.436   | M38X1.0-6g 0.100R | M31X1.0-6g 0.100R |
| D38999/24*H****       | ACT 94*H****     | H (23)     | 2.189     | 1.556   | M41X1.0-6g 0.100R | M34X1.0-6g 0.100R |
| D38999/24*J****       | ACT 94*J****     | J (25)     | 2.311     | 1.686   | M44X1.0-6g 0.100R | M37X1.0-6g 0.100R |

Jam nut mounting

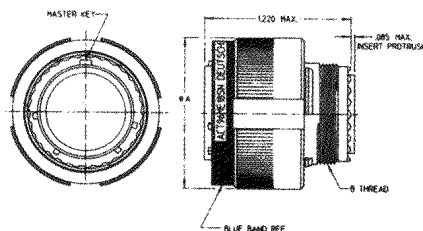
Panel thickness

1.58 - 3.2mm (0.062 - 0.126 in.)



| SHELL SIZE | INCH-LBS. TORQUE | E +.00<br>-.25 | F +.25<br>-.00 |
|------------|------------------|----------------|----------------|
| A (9)      | 30/36            | 17.02 (.670)   | 17.78 (.700)   |
| B (11)     | 40/46            | 18.59 (.771)   | 20.96 (.825)   |
| C (13)     | 55/60            | 24.26 (.955)   | 25.63 (1.010)  |
| D (15)     | 70/75            | 27.56 (1.085)  | 28.83 (1.135)  |
| E (17)     | 80/85            | 30.73 (1.210)  | 32.01 (1.260)  |
| F (19)     | 90/95            | 33.91 (1.335)  | 35.18 (1.385)  |
| G (21)     | 100/110          | 37.08 (1.460)  | 38.35 (1.510)  |
| H (23)     | 110/120          | 40.26 (1.585)  | 41.53 (1.635)  |
| J (25)     | 120/130          | 43.43 (1.710)  | 44.70 (1.760)  |

Plug\*



| MILITARY PART NUMBERS | DEUTSCH PART NO. | SHELL SIZE | C THREAD                | AØ MAX |
|-----------------------|------------------|------------|-------------------------|--------|
| D38999/26*A****       | ACT 96*A****     | A (9)      | M12X1.0-6g 0.100R .858  | .858   |
| D38999/26*B****       | ACT 96*B****     | B (11)     | M15X1.0-6g 0.100R .984  | .984   |
| D38999/26*C****       | ACT 96*C****     | C (13)     | M18X1.0-6g 0.100R 1.157 | 1.157  |
| D38999/26*D****       | ACT 96*D****     | D (15)     | M22X1.0-6g 0.100R 1.279 | 1.280  |
| D38999/26*E****       | ACT 96*E****     | E (17)     | M25X1.0-6g 0.100R 1.405 | 1.406  |
| D38999/26*F****       | ACT 96*F****     | F (19)     | M28X1.0-6g 0.100R 1.515 | 1.516  |
| D38999/26*G****       | ACT 96*G****     | G (21)     | M31X1.0-6g 0.100R 1.641 | 1.642  |
| D38999/26*H****       | ACT 96*H****     | H (23)     | M34X1.0-6g 0.100R 1.766 | 1.766  |
| D38999/26*J****       | ACT 96*J****     | J (25)     | M37X1.0-6g 0.100R 1.889 | 1.890  |



INSERT ARRANGEMENTS

A-35  
6 SIZE 22D CONTACTS



A-98  
3 SIZE 20 CONTACTS



B-05  
5 SIZE 20 CONTACTS



B-35  
13 SIZE 22D CONTACTS



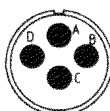
B-98  
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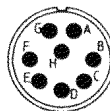
B-99  
7 SIZE 20 CONTACTS



C-04  
4 SIZE 16 CONTACTS



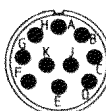
C-08  
8 SIZE 20 CONTACTS



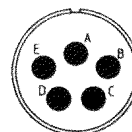
C-35  
22 SIZE 22D CONTACTS



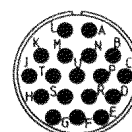
C-98  
10 SIZE 20 CONTACTS



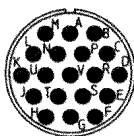
D-05  
5 SIZE 16 CONTACTS



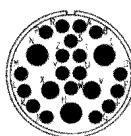
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18 SIZE 20 CONTACTS



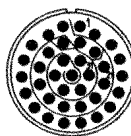
D-19  
19 SIZE 20 CONTACTS



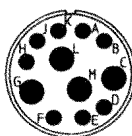
D-23  
3 SIZE 16 CONTACTS  
2 SIZE 20 CONTACTS  
18 SIZE 22 CONTACTS



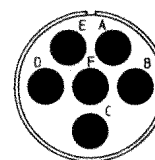
D-35  
37 SIZE 22D CONTACTS



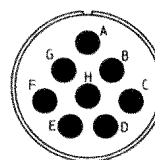
D-97  
4 SIZE 16 CONTACTS  
8 SIZE 20 CONTACTS



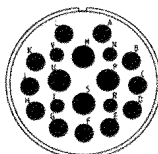
E-06  
6 SIZE 12 CONTACTS



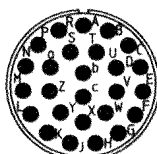
E-08  
8 SIZE 16 CONTACTS



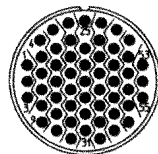
E-19  
4 SIZE 16 CONTACTS  
11 SIZE 20 CONTACTS  
4 SIZE 22 CONTACTS



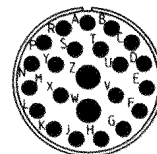
E-26  
26 SIZE 20 CONTACTS



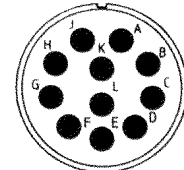
E-35  
55 SIZE 22D CONTACTS



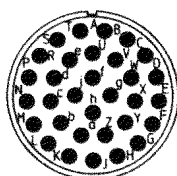
E-99  
21 SIZE 20 CONTACTS  
2 SIZE 16 CONTACTS



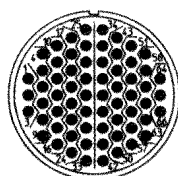
F-11  
11 SIZE 16 CONTACTS



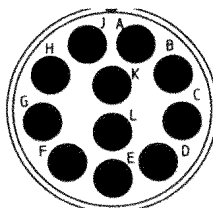
F-32  
32 SIZE 20 CONTACTS



F-35  
66 SIZE 22D CONTACTS



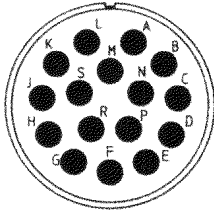
G-11  
11 SIZE 12 CONTACTS



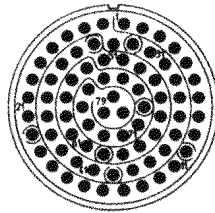
Please consult factory for additional insert arrangements.



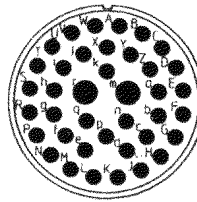
G-16  
16 SIZE 16 CONTACTS



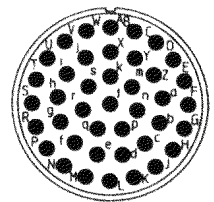
G-35  
79 SIZE 22D CONTACTS



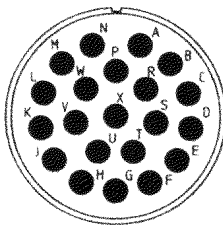
G-39  
37 SIZE 20 CONTACTS  
2 SIZE 16 CONTACTS



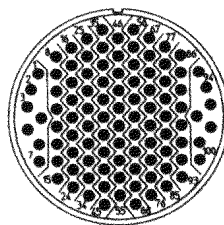
G-41  
41 SIZE 20 CONTACTS



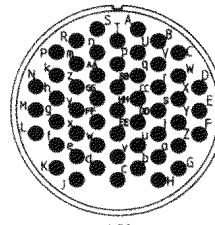
H-21  
21 SIZE 16 CONTACTS



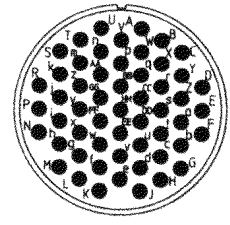
H-35  
100 SIZE 22D CONTACTS



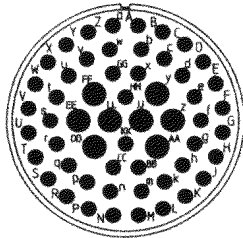
H-53  
53 SIZE 20 CONTACTS



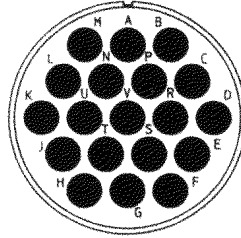
H-55  
55 SIZE 20 CONTACTS



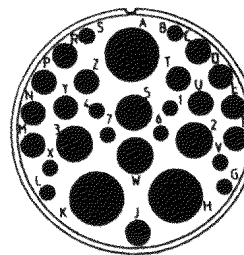
J-04  
8 SIZE 16 CONTACTS  
48 SIZE 20 CONTACTS



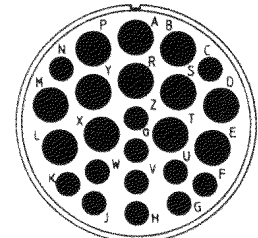
J-19  
19 SIZE 12 CONTACTS



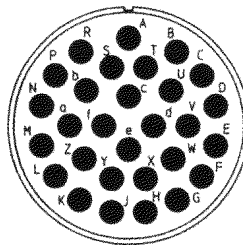
J-20  
3 SIZE 8 TWINAX CONTACTS  
4 SIZE 12 COAX CONTACTS  
13 SIZE 16 CONTACTS  
10 SIZE 20 CONTACTS



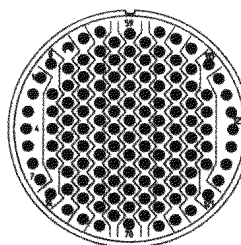
J-24  
12 SIZE 12 CONTACTS  
12 SIZE 16 CONTACTS



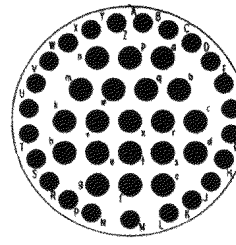
J-29  
29 SIZE 16 CONTACTS



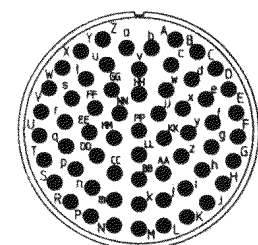
J-35  
128 SIZE 22D CONTACTS



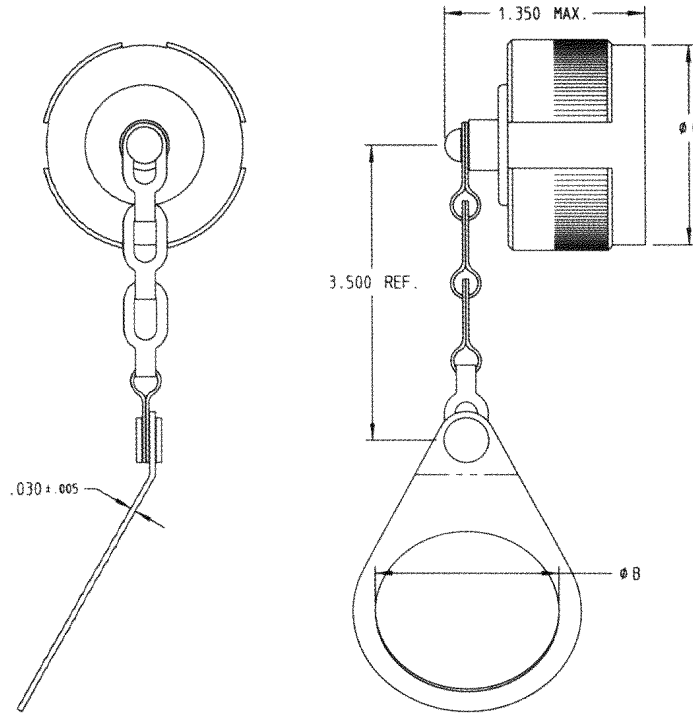
J-43  
20 SIZE 16 CONTACTS  
23 SIZE 20 CONTACTS



J-61  
61 SIZE 20 CONTACTS

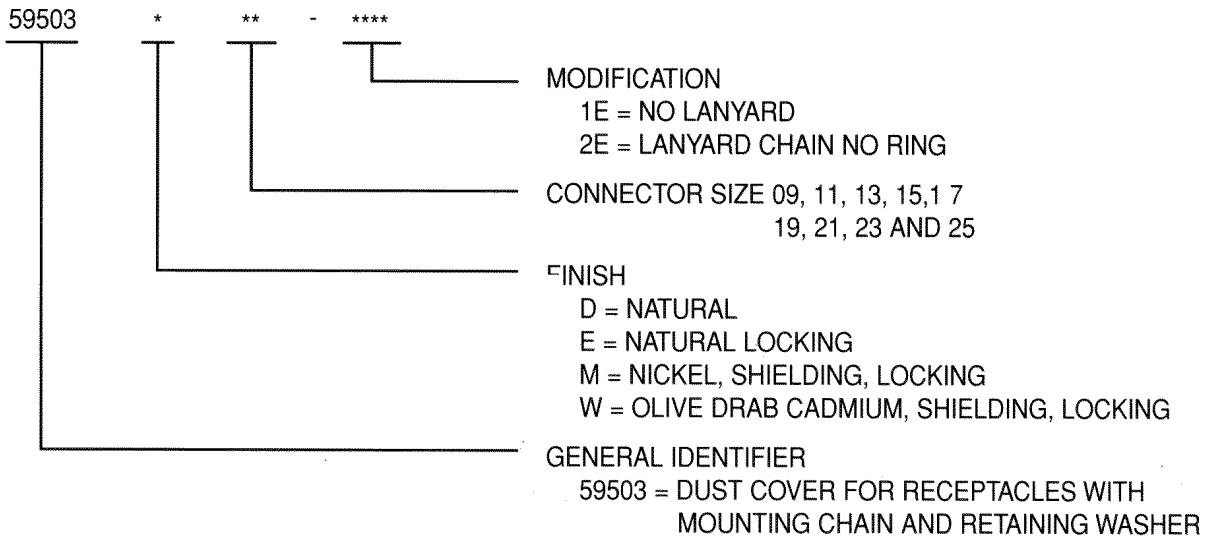


# Protective Covers for 38999 III Composite and Metal



Available in both environmental and environmental RFI/EMI (Shielding).

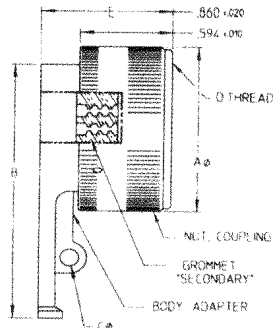
## Part Numbers



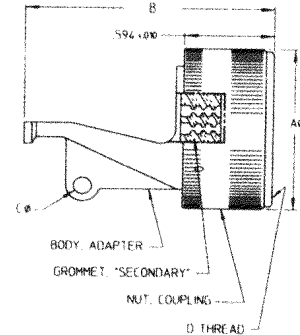
# Lightweight Strain Relief, Tie-Type

The ACT provides additional environmental protection by offering a systems approach to rear accessories. The ACT Strain Relief, Tie-Type is made from durable, lightweight, corrosion proof composite materials, and is supplied with a secondary grommet. The secondary grommet provides true strain relief and vibration dampening while providing dynamic moisture intrusion seals.

90 Degree



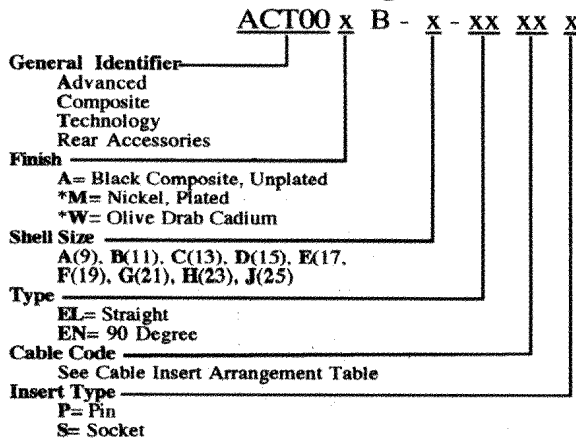
Straight



| SHELL SIZE | ±.015 A $\phi$ | ±.080 B | ±.010 C $\phi$ | D METRIC THREAD  | ±.015 E |
|------------|----------------|---------|----------------|------------------|---------|
| A          | .650           | 1.948   | .140           | M12X1.0-6H0.100R | .832    |
| B          | .775           | 2.010   | .140           | M15X1.0-6H0.100R | .832    |
| C          | .905           | 2.075   | .140           | M18X1.0-6H0.100R | .832    |
| D          | 1.030          | 2.135   | .140           | M22X1.0-6H0.100R | .832    |
| E          | 1.160          | 2.198   | .140           | M25X1.0-6H0.100R | .832    |
| F          | 1.270          | 2.258   | .140           | M28X1.0-6H0.100R | .832    |
| G          | 1.400          | 2.320   | .140           | M31X1.0-6H0.100R | .832    |
| H          | 1.525          | 2.383   | .140           | M34X1.0-6H0.100R | .832    |
| J          | 1.655          | 2.445   | .140           | M37X1.0-6H0.100R | .832    |

| SHELL SIZE | ±.015 A $\phi$ | ±.080 B | ±.010 C $\phi$ | D METRIC THREAD  |
|------------|----------------|---------|----------------|------------------|
| A          | .650           | 1.642   | .120           | M12X1.0-6H0.100R |
| B          | .775           | 1.642   | .120           | M18X1.0-6H0.100R |
| C          | .905           | 1.642   | .120           | M15X1.0-6H0.100R |
| D          | 1.030          | 1.642   | .120           | M22X1.0-6H0.100R |
| E          | 1.160          | 1.642   | .140           | M25X1.0-6H0.100R |
| F          | 1.270          | 1.642   | .140           | M28X1.0-6H0.100R |
| G          | 1.400          | 1.642   | .140           | M31X1.0-6H0.100R |
| H          | 1.525          | 1.642   | .140           | M34X1.0-6H0.100R |
| J          | 1.655          | 1.642   | .140           | M37X1.0-6H0.100R |

## Strain Relief Ordering Information



\*Consult factory for availability.

## Cable Insert Arrangements

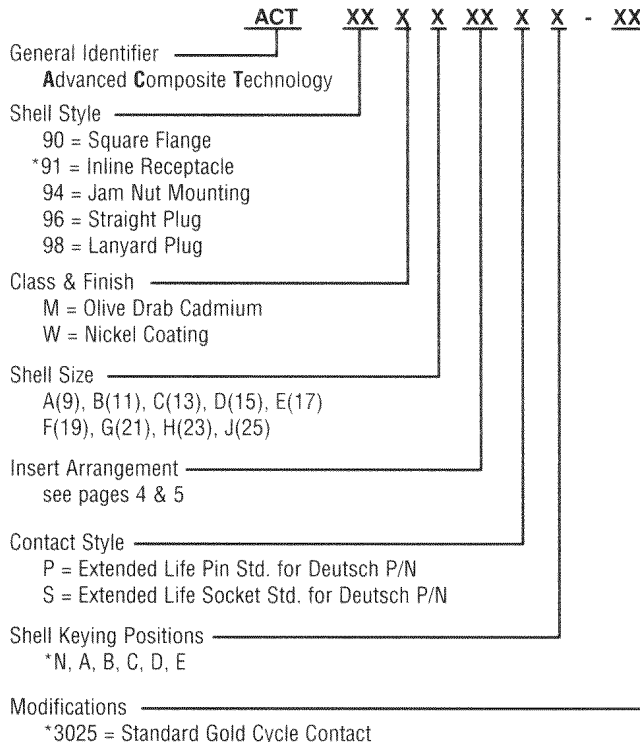
| CABLE CODE | INSERT ARR. | CABLE CODE | INSERT ARR. | CABLE CODE | INSERT ARR. |
|------------|-------------|------------|-------------|------------|-------------|
| 38         | A-35        | 53         | E-35        | 88         | J-24        |
| 39         | A-98        | 54         | F-11        | 69         | J-29        |
| 40         | B-05        | 55         | F-32        | 70         | J-35        |
| 41         | B-35        | 56         | F-35        | 71         | J-61        |
| 42         | B-99        | 57         | G-11        | 92         | B-98        |
| 43         | C-04        | 58         | G-16        | 93         | D-19        |
| 44         | C-35        | 59         | G-35        | 94         | C-08        |
| 45         | C-98        | 60         | G-41        | 95         | E-99        |
| 46         | D-05        | 61         | H-21        | 96         | G-39        |
| 47         | D-18        | 62         | H-35        | 97         | J-43        |
| 48         | D-35        | 63         | H-53        | 98         | D-23        |
| 49         | D-97        | 64         | H-55        | 99         | E-19        |
| 50         | F-06        | 65         | J-04        | 100        | D-26        |
| 51         | E-08        | 66         | J-19        |            |             |
| 52         | E-26        | 67         | J-20        |            |             |



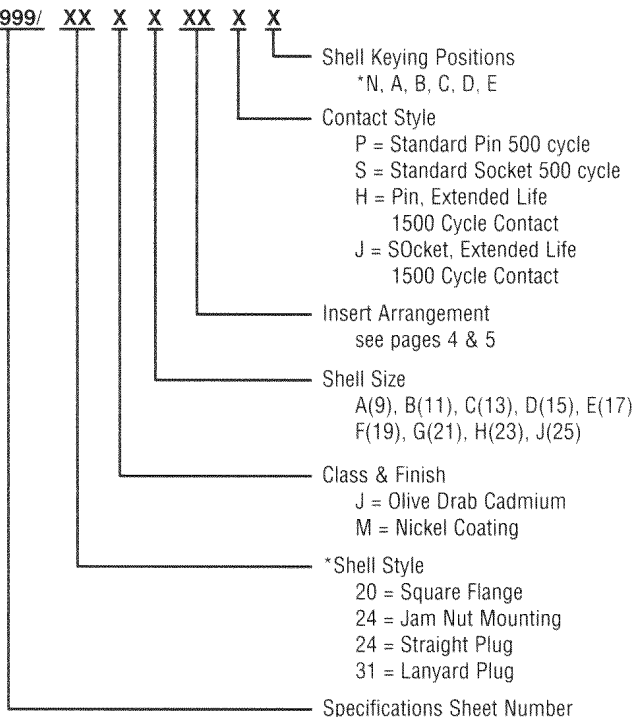


# Ordering information

## Deutsch Connector Part Numbers



## Military Composite Connector Part Numbers



\*Consult Factory for availability

# Contact & Tooling Information

| Contact Deutsch Size | Part Number          | Style  | Wire Gauge | Crimp Tool (Positioner)             | Military Insertion Extraction Tool | Strip Length | Sealing Plugs Deutsch Part Number | Color Code |
|----------------------|----------------------|--------|------------|-------------------------------------|------------------------------------|--------------|-----------------------------------|------------|
| 22D                  | 12331-22<br>38941-22 | PIN    | 22 THRU 28 | M22520/7-01<br>(M22520/7-07)        | M81969/14-01                       | .160-.190    | MS27488-22                        | GREEN      |
| 22D                  | 12333-22<br>38943-22 | SOCKET | 22 THRU 28 | M22520/7-01<br>(M22520/7-05)        | M81969/14-01                       | .160-.190    | MS27488-22                        | GREEN      |
| 20                   | 12331-20<br>38941-20 | PIN    | 20 THRU 24 | M22520/1-01<br>(M22520/1-04) RED    | M81969/14-10                       | 230-.260     | 4113-4-2001                       | RED        |
| 20                   | 12333-20<br>38943-20 | SOCKET | 20 THRU 24 | M22520/1-01<br>(M22520/1-04) RED    | M81969/14-10                       | 230-.260     | 4113-4-2001                       | RED        |
| 16                   | 12331-16<br>38941-16 | PIN    | 20 THRU 16 | M22520/1-01<br>(M22520/1-04) BLUE   | M81969/14-03                       | 230-.260     | 0613-1-1601                       | BLUE       |
| 16                   | 12333-16<br>38943-16 | SOCKET | 20 THRU 16 | M22520/1-01<br>(M22520/1-04) BLUE   | M81969/14-03                       | 230-.260     | 0613-1-1601                       | BLUE       |
| 12                   | 12331-12<br>38941-12 | PIN    | 12 THRU 14 | M22520/1-01<br>(M22520/1-04) YELLOW | M81969/14-04                       | 230-.260     | 0613-1-1201                       | YELLOW     |
| 12                   | 12333-12<br>38943-12 | SOCKET | 12 THRU 14 | M22520/1-01<br>(M22520/1-04) YELLOW | M81969/14-04                       | 230-.260     | 0613-1-1201                       | YELLOW     |



This information is for reference only. Consult factory for envelope drawings, updated specifications, and additions to the product line.