DEUTSCH

BRANCHE CONNECTEURS AEROMILITAIRES

# *ACT series* *Normes MIL-DTL 38999 Séries III*

Composite

# Summary

ACT


| | |
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| 1 | Introduction |
| 2 | Synoptic |
| 3 | Technical characteristics |
| 4 | Part-numbering system |
| 5 | Arrangements |
| 6 | Receptacles |
| 7 | Plug / Panel seal |
| 8 | Mating and unmating dimensions |
| 9 | Mounting cutouts |
| 10-11 | Contacts and Tools |

The Deutsch ACT is a high performance composite connector qualified to MIL-DTL-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-DTL-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

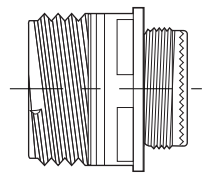
The total performance of the ACT connector is matched by individual components within the system. For example, the use of composite materials has increased the durability of the connector housing and coupling mechanism to 1500 cycles. Deutsch developed an extended life MIL-C-39029 contact to meet the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

**SEALED receptacles**

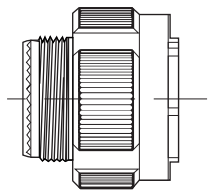
**TYPE 90**



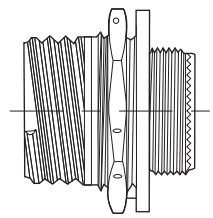
4 holes square flange mounting

**Plug**

**TYPE 96**



**TYPE 94**



Single hole mounting

## Mechanical

| | | | |
|---|---|---|---|
| Shell | Material | : | Composite |
| | Plating | : | W - Olive drab cadmium,<br>M - Nickel coating |
| Insert | Material | : | Thermoplastic and fluorinated silicone elastomer |
| Flat gasket and o'ring | Material | : | fluoronited silicone elastomer |
| Contact | Material | : | Copper alloy |
| | Plating | : | Gold |
| | Type | : | Crimp type or printed circuit pin (consult us) |
| Retention | | : | Size 22 D: 44 N<br>Size 20 : 67 N<br>Size 16 : 111 N<br>Size 12 : 111 N<br>Size 8 : 111 N |
| Vibrations | | : | As per MIL-DTL-38999 |
| Physical shocks | | : | 300 g, 3 ms in the 3 axes |
| Durability | | : | 1500 coupling and uncoupling cycles |

## Climatics

| | | |
|---|---|---|
| Service temperature | : | Cadmium plating - 65° C to + 175° C<br>: Nickel plating - 65° C to + 200° c |
| Thermal shocks | : | As per MIL-DTL-38999 |
| Sealing | : | Leakage ≤ 16 cm3/h on mated connecting under 2,1 bars |
| Salt spray resistance | : | 2000 hours, class W as per MIL-DTL-38999<br>2000 hours class M, as per MIL-DTL-38999 |

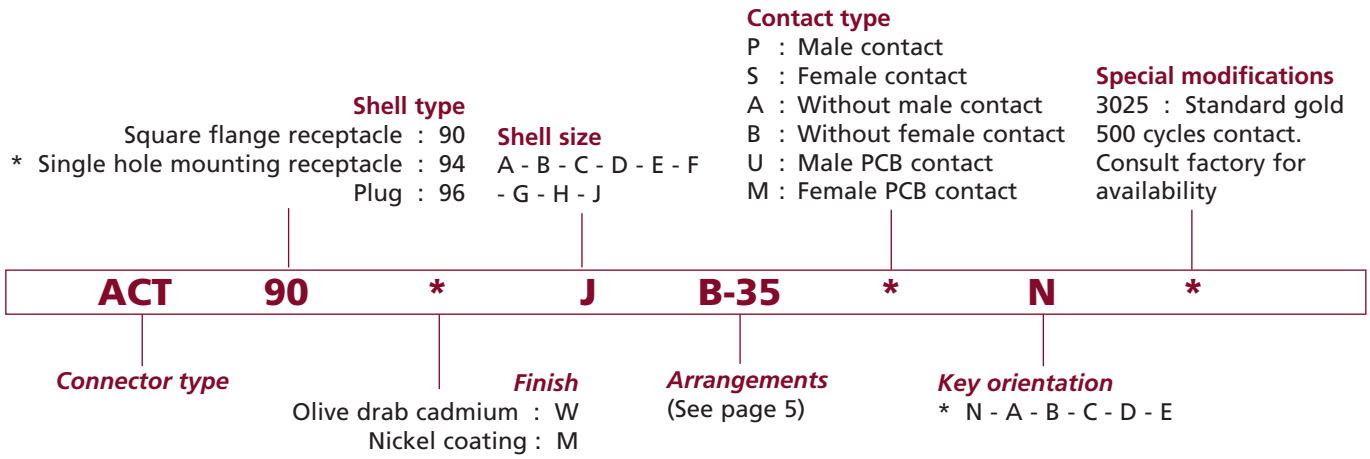
## Electrical

| | | | | |
|---|---|---|---|---|
| Withstanding voltage | at sea level | : | Service M : 1300 V<br>Service I : 1800 V<br>Service II : 2300 V | |
| | at 21000 m altitude | : | Mated connector | Unmated connector |
| | | | Service M : 800 V | Service M : 350 V |
| | | | Service I : 1000 V | Service I : 400 V |
| | | | Service II : 1000 V | Service II : 500 V |
| Insulation resistance (Ambiant temperature) | | : | 5000 MΩ to 25° C and 65 % HR max. | |
| Voltage drop | | : | size 22 : test to 5 Amp. = 73 millivolts max.<br>Size 20 : test to 7,5 Amp. = 55 millivolts max.<br>Size 16 : test to 12 Amp. = 49 millivolts max.<br>Size 12 : test to 23 Amp. = 42 millivolts max.<br>Size 8 : test to 46 Amp. = 26 millivolts max. | |
| Shielding | | : | As per MIL-DTL-38999 | |

| Size | Contacts current Sealed version | Diameter over Insulation sheath in mm | Permitted wire Sizes section in mm² |
|---|---|---|---|
| 22 | 5 A | 0,76 to 1,37 | 0,095 to 0,38 |
| 20 | 7,5 A | 1,01 to 2,10 | 0,21 to 0,60 |
| 16 | 13 A. | 1,65 to 2,77 | 0,60 to 1,34 |
| 12 | 23 A. | 2,46 to 3,61 | 1,91 to 3,18 |
| 8 | 46 A. | 4,50 to 5,80 | 5,30 to 8,98 |

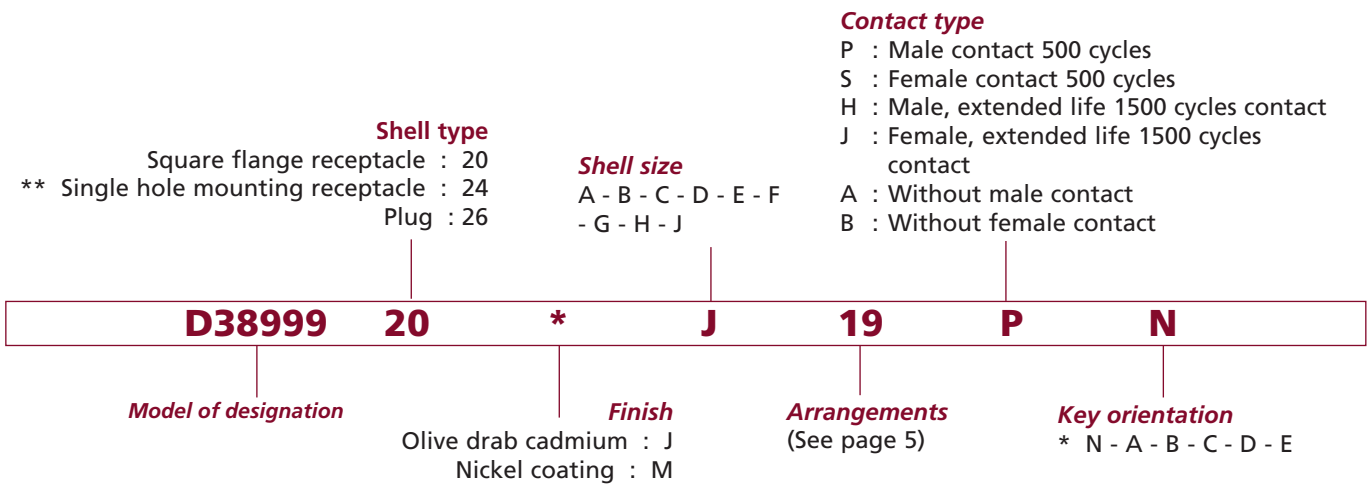
For more information, see MIL-DTL-38999 series III

## DEUTSCH System




The square flange receptacle is never delivered with panel seal. For ordering panel seals see page 9.
For standard contacts delivered with the connector, see page 10.

## MIL-DTL-38999 SYSTEM




* Consult factory for availability
** Consult factory for current QPL listing.

Male insert viewed from front face.

**Disposition A-35**
6 contacts size 22

**Disposition A-98**
3 contacts size 20

**Disposition B-02**
2 contacts size 16

**Disposition B-05**
5 contacts size 20

**Disposition B-35**
13 contacts size 22

**Disposition B-98**
6 contacts size 20

**Disposition B-99**
7 contacts size 20

**Disposition C-04**
4 contacts size 16

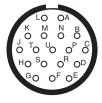
**Disposition C-08**
8 contacts size 20

**Disposition C-35**
22 contacts size 22

**Disposition C-98**
10 contacts size 20

**Disposition D-05**
5 contacts size 16

**Disposition D-15**
14 contacts size 20
1 contacts size 16



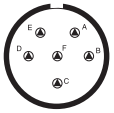
**Disposition D-18**
18 contacts size 20

**Disposition D-19**
19 contacts size 20

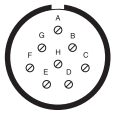
**Disposition D-35**
37 contacts size 22

**Disposition D-97**
8 contacts size 20
4 contacts size 16

**Disposition E-02**
38 contacts size 22
1 contacts size 8



**Disposition E-06**
6 contacts size 12

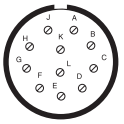


**Disposition E-08**
8 contacts size 16

**Disposition E-26**
26 contacts size 20

**Disposition E-35**
55 contacts size 22

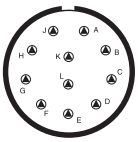
**Disposition E-99**
21 contacts size 20
2 contacts size 16



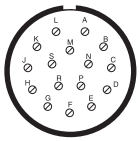
**Disposition F-11**
11 contacts size 16

**Disposition F-32**
32 contacts size 20

**Disposition F-35**
66 contacts size 22



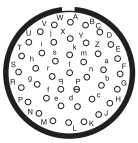
**Disposition G-11**
11 contacts size 12



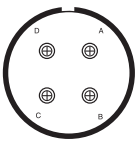
**Disposition G-16**
16 contacts size 16

**Disposition G-35**
79 contacts size 22

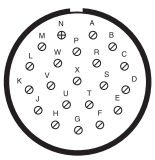
**Disposition G-39**
2 contacts size 16
37 contacts size 20



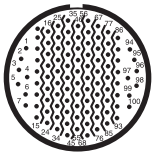
**Disposition G-41**
41 contacts size 20



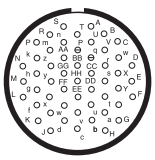
**Disposition G-75**
4 contacts size 8



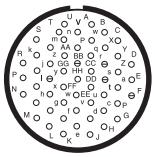
**Disposition H-21**
21 contacts size 16



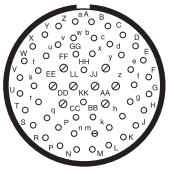
**Disposition H-35**
100 contacts size 22



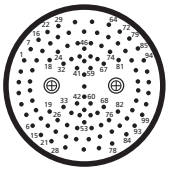
**Disposition H-53**
53 contacts size 20



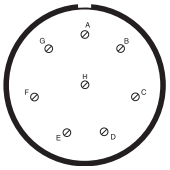
**Disposition H-55**
55 contacts size 20



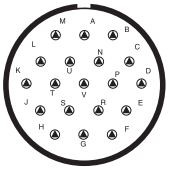
**Disposition J-04**
48 contacts size 20
8 contacts size 16



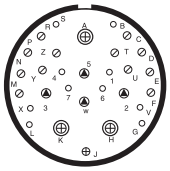
**Disposition J-7**
97 contacts size 22
2 contacts size 8



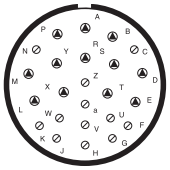
**Disposition J-8**
8 contacts size 8



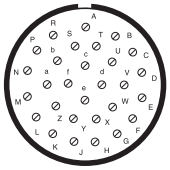
**Disposition J-19**
19 contacts size 12



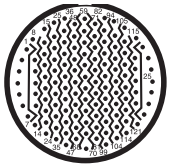
**Disposition J-20***
10 contacts size 20
13 contacts size 16
4 contacts size 12
3 contacts size 8



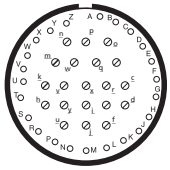
**Disposition J-24**
12 contacts size 16
12 contacts size 12



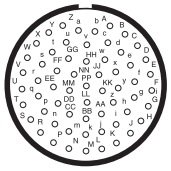
**Disposition J-29**
29 contacts size 16



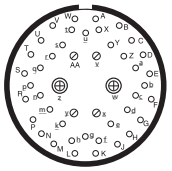
**Disposition J-35**
128 contacts size 22



**Disposition J-43**
23 contacts size 20
20 contacts size 16



**Disposition J-61**
61 contacts size 20

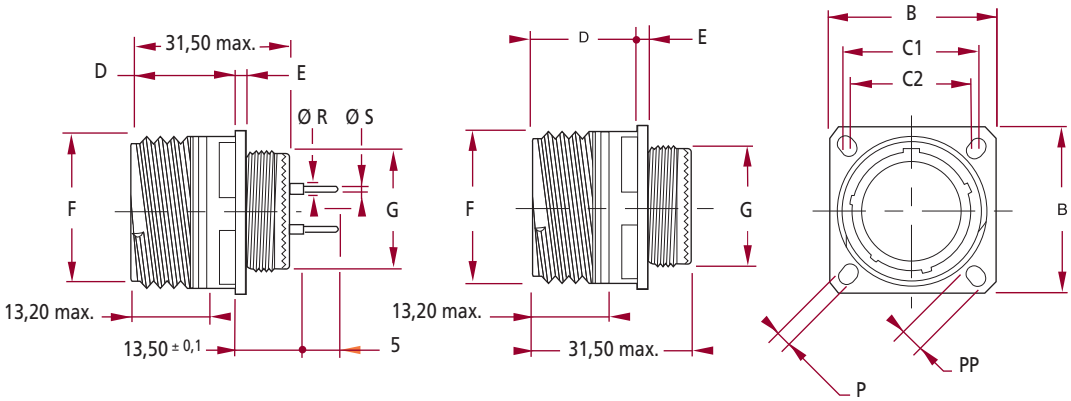


**Disposition J-90**
40 contacts size 20
4 contacts size 16
2 contacts size 8

* Sold less contacts tools, and sealing plugs

Arrangements is not currently a MIL-DTL-38999 specification, please refer to MIL-STD-1560

## Square flange - TYPE 90



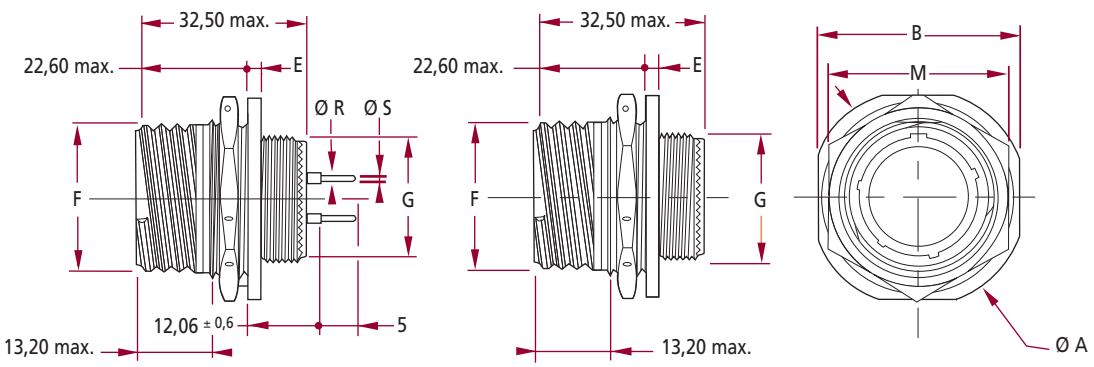

*With PCB contacts*

| Contact Size | R + 0 - 0,05 | S ± 0,05 |
|---|---|---|
| 22 | 10,5 | |
| 20 | 1,5 | 0,7 |
| 16 | 2,6 | 1,15 |

P/N PCB contacts, page 11

| Size | B ± 0,3 | C1 | C2 | D max. | E | F ± 0,1 | G ± 0,1 | P ± 0,2 | PP ± 0,2 | Mass max. |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 23,80 | 18,26 | 15,09 | 19,50 | 3,65 | 15,75 | 11,90 | 3,25 | 5,49 | 8,00 |
| B | 26,20 | 20,62 | 18,26 | 19,50 | 3,65 | 18,90 | 14,90 | 3,25 | 4,93 | 11,00 |
| C | 28,60 | 23,01 | 20,62 | 19,50 | 3,65 | 22,10 | 17,90 | 3,25 | 4,93 | 14,00 |
| D | 31,00 | 24,61 | 23,01 | 19,50 | 3,65 | 25,25 | 21,90 | 3,25 | 4,93 | 18,00 |
| E | 33,30 | 26,97 | 24,61 | 19,50 | 3,65 | 29,95 | 24,90 | 3,25 | 4,93 | 23,00 |
| F | 36,50 | 29,36 | 26,97 | 19,50 | 3,65 | 31,55 | 27,90 | 3,25 | 4,93 | 26,00 |
| G | 39,70 | 31,75 | 29,36 | 18,70 | 4,35 | 34,70 | 30,90 | 3,25 | 4,93 | 31,00 |
| H | 42,90 | 34,93 | 31,75 | 18,70 | 4,35 | 37,90 | 33,90 | 3,91 | 6,15 | 36,00 |
| J | 46,00 | 38,10 | 34,93 | 18,70 | 4,35 | 41,10 | 36,90 | 3,91 | 6,15 | 43,00 |

## Single hole mounting - TYPE 94



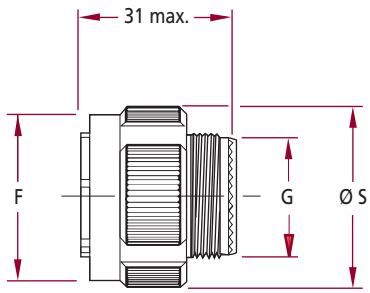

With PCB contacts

| Contact Size | R + 0 - 0,05 | S ± 0,05 |
|---|---|---|
| 22 | 10,5 | |
| 20 | 1,5 | 0,7 |
| 16 | 2,6 | 1,15 |

P/N PCB contacts, page 11

| Size | A ± 0,3 | B ± 0,4 | E + 0,7 - 0,1 | F ± 0,1 | G ± 0,1 | M | Mass max. |
|---|---|---|---|---|---|---|---|
| A | 30,20 | 27,00 | 3,00 | 15,75 | 11,90 | 21,82 | 11,00 |
| B | 34,90 | 31,80 | 3,00 | 18,90 | 14,90 | 24,99 | 14,00 |
| C | 38,10 | 34,90 | 3,00 | 22,10 | 17,90 | 29,77 | 18,00 |
| D | 41,30 | 38,10 | 3,00 | 25,25 | 21,90 | 32,91 | 23,00 |
| E | 44,50 | 41,30 | 3,00 | 29,95 | 24,90 | 36,12 | 29,00 |
| F | 49,20 | 46,00 | 3,70 | 31,55 | 27,90 | 39,25 | 35,00 |
| G | 52,40 | 49,20 | 3,70 | 34,70 | 30,90 | 42,47 | 38,00 |
| H | 55,60 | 52,40 | 3,70 | 37,90 | 33,90 | 45,61 | 46,00 |
| J | 58,70 | 55,60 | 3,70 | 41,10 | 36,90 | 49,25 | 55,00 |

## TYPE 96

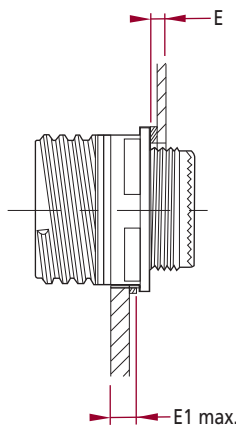


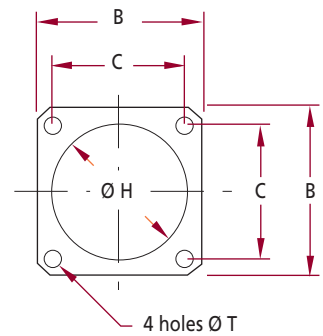

| Size | F max. | G max. | S max. | Mass max. |
|---|---|---|---|---|
| A | 18,40 | 11,90 | 21,80 | 9,00 |
| B | 21,10 | 14,90 | 25,00 | 13,00 |
| C | 25,40 | 17,90 | 29,40 | 18,00 |
| D | 28,70 | 21,90 | 32,50 | 23,00 |
| E | 32,20 | 24,90 | 35,70 | 25,00 |
| F | 34,90 | 27,90 | 38,50 | 32,00 |
| G | 38,10 | 30,90 | 41,70 | 35,00 |
| H | 41,10 | 33,90 | 44,90 | 41,00 |
| J | 44,30 | 36,90 | 48,00 | 48,00 |

# Panel seal

## For square flange receptacle

Sealed version



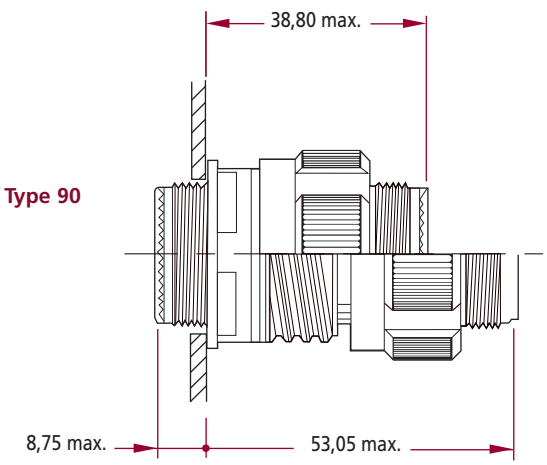




| Front flange mounting | | | | | | | | Rear flange mounting | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Size | Part-Number | H max. | B max. | C ± 0,10 | E max. | E1 max. | T max. | H max. | Part-Number | Size |
| A | 108-0003-10 | 15,40 | 24,30 | 18,30 | 3,00 | 5,92 | 3,30 | 14,10 | 108-0004-10 | A |
| B | 108-0001-12 | 18,40 | 26,70 | 20,60 | 3,00 | 5,92 | 3,30 | 17,20 | 108-0004-12 | B |
| C | 108-0001-14 | 22,70 | 29,10 | 23,00 | 3,00 | 5,92 | 3,30 | 20,40 | 108-0004-14 | C |
| D | 108-0001-16 | 25,90 | 31,30 | 24,60 | 3,00 | 5,92 | 3,30 | 23,60 | 108-0004-16 | D |
| E | 108-0003-18 | 29,10 | 33,70 | 27,00 | 3,00 | 5,92 | 3,30 | 26,80 | 108-0004-18 | E |
| F | 108-0003-20 | 32,30 | 36,90 | 29,40 | 3,00 | 5,92 | 3,30 | 30,60 | 108-0001-20 | F |
| G | 108-0003-22 | 35,40 | 40,10 | 31,75 | 3,00 | 5,16 | 3,30 | 33,50 | 108-0001-22 | G |
| H | 108-0003-24 | 38,60 | 43,30 | 34,90 | 3,00 | 5,16 | 4,30 | 36,30 | 108-0004-24 | H |
| J | 108-0001-25 | 41,10 | 46,00 | 38,10 | 3,00 | 4,87 | 3,90 | 37,70 | 108-0012-25 | J |

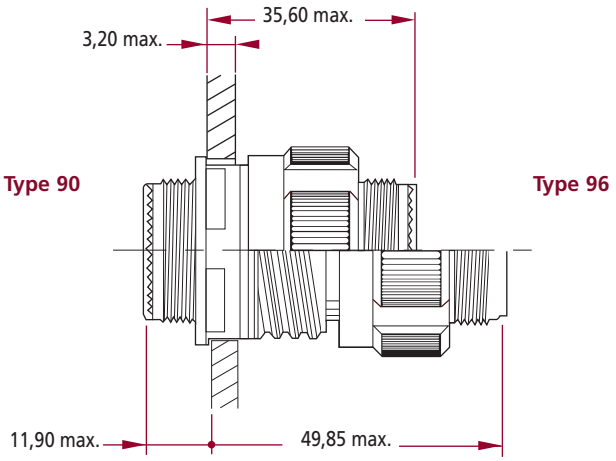
Nota : The panel seal is never delivered with receptacle. To be ordered separatly.

## Square flange - TYPES 90 - 96

Front mounting

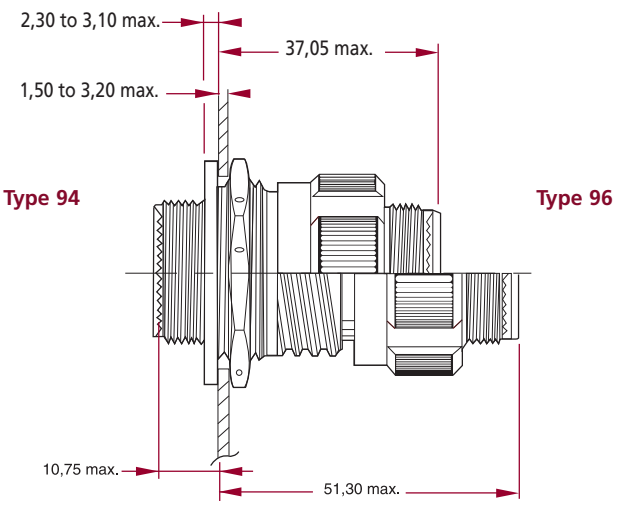



Rear mounting




| Size | Coupling torque Mating Nm mini | Unmating Nm max. |
|---|---|---|
| A | 0,2 | 0,9 |
| B | 0,2 | 1,4 |
| C | 0,2 | 1,8 |
| D | 0,3 | 2,3 |
| E | 0,3 | 2,7 |
| F | 0,3 | 3,2 |
| G | 0,6 | 3,6 |
| H | 0,6 | 4,1 |
| J | 0,6 | 4,6 |

## TYPE 94 - 96

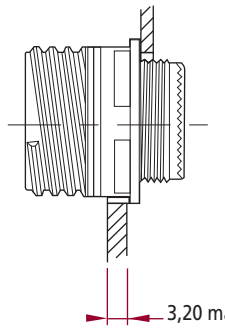



| Size | Coupling torque Mating Nm mini | Unmating Nm max. |
|---|---|---|
| A | 0,2 | 0,9 |
| B | 0,2 | 1,4 |
| C | 0,2 | 1,8 |
| D | 0,3 | 2,3 |
| E | 0,3 | 2,7 |
| F | 0,3 | 3,2 |
| G | 0,6 | 3,6 |
| H | 0,6 | 4,1 |
| J | 0,6 | 4,6 |

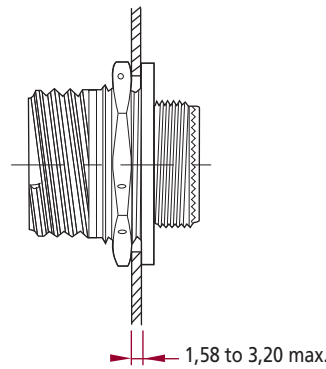
## For sealed receptacles - TYPE 90 - 94

**Type 90**

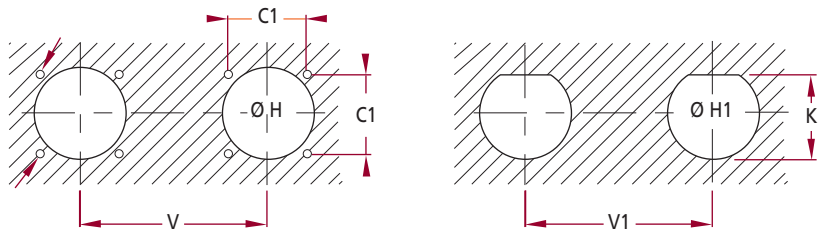
Front panel mounting




**Type 94**



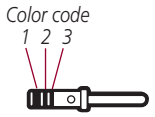

Panel cutout



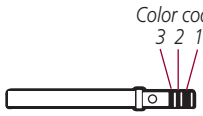

| Size | C1 | H mini | | H1 | K | V | V1 | Coupling torque | |
|---|---|---|---|---|---|---|---|---|---|
| | | Front | Rear | + 0.25 - 0 | + 0.25 - 0 | mini. | mini. | Nm mini | Nm ma |
| A | 18,26 | 13,11 | 16,66 | 17,70 | 16,99 | 24,60 | 27,80 | 3,40 | 4,00 |
| B | 20,62 | 15,08 | 22,22 | 20,88 | 19,53 | 27,00 | 32,60 | 4,50 | 5,20 |
| C | 23,01 | 19,05 | 23,42 | 25,58 | 24,26 | 30,20 | 36,00 | 6,20 | 6,80 |
| D | 24,61 | 23,01 | 26,59 | 28,80 | 27,53 | 33,30 | 39,60 | 7,90 | 8,50 |
| E | 26,97 | 25,81 | 30,96 | 31,98 | 30,68 | 36,50 | 43,30 | 9,00 | 9,60 |
| F | 29,36 | 28,98 | 32,94 | 35,15 | 33,86 | 39,30 | 47,00 | 10,20 | 10,70 |
| G | 31,75 | 32,16 | 36,12 | 38,28 | 37,06 | 42,50 | 50,60 | 11,30 | 12,40 |
| H | 34,93 | 34,93 | 39,29 | 41,50 | 40,01 | 45,70 | 54,20 | 12,40 | 13,50 |
| J | 38,10 | 37,69 | 42,47 | 44,68 | 43,41 | 48,80 | 59,70 | 13,60 | 14,70 |

## Standard gold 500 cycles contact (3025)

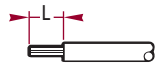
color code
For contact P as per MIL-DTL 38999



Male contact

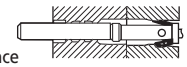


Female contact



Wires strip length

Sealing plug


Connector rear face

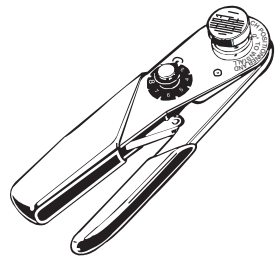
| CONTACTS | | | | | | | CABLES | | | SEALING PLUG | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Commercial Part-number | Type | Size | Color code 1 | 2 | 3 | Observations | Section mm² | AWG wire | Ø over sheath | L | P/N | Color code |
| 724-0001-22 | P | 22 | Orange | Blue | Black | Standard contact | 0,10 to 0,38 | 22 - 28 | 0,76 to 1,37 | 5,00 to 5,80 | 028-0102-22 | Yellow |
| 724-0007-22 | S | | Orange | Yellow | Grey | | | | | | | |
| 724-0001-20 | P | 20 | Orange | Blue | Orange | Standard contact | 0,21 to 0,60 | 20 - 24 | 1,02 to 2,11 | 5,80 to 6,60 | 006-0893-20 | Red |
| 724-0007-20 | S | | Orange | Green | Brown | | | | | | | |
| 724-0001-16 | P | 16 | Orange | Blue | Yellow | Standard contact | 0,60 to 1,34 | 16 - 20 | 1,65 to 2,77 | 5,80 to 6,60 | 006-0893-16 | Bleu |
| 724-0007-16 | S | | Orange | Green | Red | | | | | | | |
| 724-0001-12 | P | 12 | Orange | Blue | Green | Standard contact | 1,93 to 3,18 | 12 - 14 | 2,46 to 3,61 | 5,80 to 6,60 | 006-0892-12 | Yellow |
| 724-0007-12 | S | | Orange | Green | Orange | | | | | | | |
| 182-0001-08 | P | 8 | - | - | - | Power contact | 5,30 to 8,98 | 8 | 4,50 to 5,80 | 9,20 to 9,80 | 182-0061-08 | - |
| 182-0003-08 | S | | | | | | | | | | | |
| 182-0068-20 | P | 20 | Yellow | Purple | Green | Alumel contact | 0,21 to 0,60 | 20 - 24 | 1,02 to 2,11 | 5,80 to 6,60 | 006-0893-20 | Red |
| 182-0009-20 | S | | Yellow | Grey | Purple | | | | | | | |
| 182-0069-20 | P | 20 | Yellow | Purple | Blue | Chromel contact | 0,21 to 0,60 | 20 - 24 | 1,02 to 2,11 | 5,80 to 6,60 | 006-0893-20 | Red |
| 182-0010-20 | S | | Yellow | Grey | Grey | | | | | | | |
| 182-0068-22 | P | 22 | Yellow | Purple | Brown | Alumel contact | 0,10 to 0,38 | 22 - 28 | 0,76 to 1,37 | 5,00 to 5,80 | 028-0102-22 | Yellow |
| 182-0009-22 | S | | Yellow | White | Green | | | | | | | |
| 182-0069-22 | P | 22 | Yellow | Purple | Red | Chromel contact | 0,10 to 0,38 | 22 - 28 | 0,76 to 1,37 | 5,00 to 5,80 | 028-0102-22 | Yellow |
| 182-0010-22 | S | | Yellow | White | Blue | | | | | | | |

| DATABUS CONTACTS SIZE 8 (TWISTED PAIR) AS PER MIL-C 38999 SERIES I, III AND IV STANDARD | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CONTACTS | | | | CABLES | | | SLEEVE | TOOLS | | |
| Part-number | Type | Size | Color code | Types | Conduct. max. section | Braid Ø max. | Types | Crimping tool Conductor | Crimping tool Ferrule | Tool Extraction |
| 182-0034-03 | P | 8 | Brown-red | braid simple | 0,86 mm² | 3,48 | Thermosetting and silicone | TDB-CT-08 | TDB-CT-HEX Mark C | 114-008 or M 81969/14-06 |
| 182-0035-03 | S | | | | | | | | | |
| 182-0034-04 | P | 8 | Red-red | Hight immunity double braid | 0,86 mm² | 3,91 | Thermosetting and silicone | TDB-CT-08 | TDB-CT-HEX Mark D | 114-008 or M 81969/14-06 |
| 182-0035-04 | S | | | | | | | | | |

Nota : Standard contacts delivered with connector.
Size 8 and Bus contacts are delivered with protect sleeve.

## Contact 1500 cycles contact

| DEUTSCH EXTENDED LIFE FINISH | | | | | | |
|---|---|---|---|---|---|---|
| Part number | Military part number | Type | Size | Color code 1 | 2 | 3 |
| 182-0441-22 | MIL-C 39029/107-620 | p | 22 | Blue | Red | Black |
| 182-0447-22 | MIL-C 39029/106-614 | S | | Blue | Brown | Yellow |
| 182-0441-20 | MIL-C 39029/107-621 | P | 20 | Blue | Red | Bown |
| 182-0447-20 | MIL-C 39029/106-615 | S | | Blue | Brown | Green |
| 182-0441-16 | MIL-C 39029/107-622 | P | 16 | Blue | Red | Red |
| 182-0447-16 | MIL-C 39029/106-616 | S | | Blue | Brown | Blue |
| 182-0441-12 | MIL-C 39029/107-623 | P | 12 | Blue | Red | Orange |
| 182-0447-12 | MIL-C 39029/106-617 | S | | Blue | Brown | Violet |



| TOOLS | | | | CONTACTS STANDARDISATION |
|---|---|---|---|---|
| Tool | | Crimping tool | Pilot stop for crimping tool | MIL-C |
| Insertion | Extraction | | | |
| M 81969/14-01 | | M 22520/2-01 | M 22520/2-09 | MIL-C 39029/58-360 |
| | | | M 22520/2-07 | MIL-C 39029/56-348 |
| M 15570-20 | | M 22520/1-01 | M 22520/1-04 | MIL-C 39029/58-363 |
| | | | | MIL-C 39029/56-351 |
| M 15570-16 | | M 22520/1-01 | M 22520/1-04 | MIL-C 39029/58-364 |
| | | | | MIL-C 39029/56-352 |
| M 15570-12 | | M 22520/1-01 | M 22520/1-04 | MIL-C 39029/58-365 |
| | | | | MIL-C 39029/56-353 |
| Manual | M 81969/14-06 | M 22520/5-01 | SP 593 | - |
| M 15570-20 | | M 22520/1-01 | M 22520/1-04 | MIL-C 39029/87-475 |
| | | | | MIL-C 39029/88-487 |
| M 15570-20 | | M 22520/1-01 | M 22520/1-04 | MIL-C 39029/87-476 |
| | | | | MIL-C 39029/88-488 |
| M 81969/14-01 | | M 22520/2-01 | M 22520/2-09 | MIL-C 39029/87-471 |
| | | | M 22520/2-07 | MIL-C 39029/89-495 |
| M 81969/14-01 | | M 22520/2-01 | M 22520/2-09 | MIL-C 39029/87-472 |
| | | | M 22520/2-07 | MIL-C 39029/89-496 |

| PCB Contacts | | |
|---|---|---|
| Part-number | Type | Size |
| 724-0902-22 | P | 22 |
| 724-0902-20 | | 20 |
| 724-0902-16 | | 16 |
| 724-0902-12 | | 12 |
| 724-0904-22 | S | 22 |
| 724-0904-20 | | 20 |
| 724-0904-16 | | 16 |
| 724-0904-12 | | 12 |

| COAXIAL Contacts | | | |
|---|---|---|---|
| Part-number | Type | Size | MIL-C 39029 |
| 724-0004-16 | P | 16 | 76 |
| 182-0013-16 | S | | 77 |
| 182-0100-12 | P | 12 | 102 |
| 182-0101-12 | S | | 103 |
| 182-0127-68 | P | 8 | 59 |
| 182-0128-68 | S | | 60 |

| SHIELDED CONTACTS | | | |
|---|---|---|---|
| Part-number | Type | Size | MIL-C 39029 |
| 182-0098-12 | P | 12 | 28 |
| 182-0099-12 | S | | 52 |

DEUTSCH

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