Amphenol HD38999 High Density

Goes from 9 to 187 contacts!

The HD38999 family of connectors has 30% more contact density than the highest density Mil Spec 38999 connectors of its size. This series of connectors was designed to utilize mil-specified 38999 components with the exception of the contacts and inserts arrangement. Utilizing existing mil-qualified 39029 size 23 contacts and 38999 insert materials, these connectors are essentially a drop-in replacement for the standard 38999 connector.

This connector design benefits users in a couple of different ways. For those users who need to increase the amount of contacts in their application, the HD38999 series allows them to do so without increasing the size of their connector. For users who are looking to decrease the overall size of their system, they can do so by using smaller shell sizes without decreasing the number of contacts.

Amphenol has qualified this series of connectors to the requirements of MIL-DTL-38999. Amphenol also manufactures this high density series in Filter, Hermetic and customized versions to fit our customers’ needs. Please contact us if additional information is required.

For more information e-mail: hd38999info@amphenol-aao.com

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MIL-DTL-38999 Series III Typical Markets:
• Military & Commercial Aviation
• Military Vehicles
• C4ISR
Easy Steps to build a part number... HD38999

1. **Select a Connector Type**

<table>
<thead>
<tr>
<th>Connector Type</th>
<th>Shell Styles</th>
<th>Service Class</th>
<th>Shell Size – Insert Arrangement</th>
<th>Contact Type</th>
<th>Alternate Positions</th>
<th>PCB Options</th>
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<tbody>
<tr>
<td>TV or PTV (Potted version)</td>
<td>06</td>
<td>RW</td>
<td>23-151</td>
<td>P</td>
<td>B</td>
<td>(P25)</td>
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2. **Select a Shell Style**

- **Designates**
  - **P** (prefix for Potted)
  - **TV** Tri-Start Series Connector
  - **TP** Tri-Start Composite Series connector
  - **MTV** CLUTCH-LOK high vibration plug connector
  - **CTV** CLUTCH-LOK high vibration straight plug (service Class RK)
  - **CTVP** CLUTCH-LOK high vibration panel mounted composite receptacle

3. **Select a Service Class**

- **Designates**
  - **00** Wall mount receptacle
  - **40** Wall mount double flange receptacle
  - **02** Box mount receptacle - consult Amphenol for availability
  - **06** Straight plug
  - **07** Jam nut double flange receptacle
  - **26** Proprietary CLUTCH-LOK high vibration straight plug (service Class RK)
  - **96** Straight plug with integral backshell (not available in composite)

4. **Select a Shell Size – Insert Arrangement**

- **Designates**
  - **RF** Electroless nickel plated aluminum, optimum EMI shielding effectiveness -65dB @ 10GHz specification min., 48 hour salt spray, 175°C
  - **RW** Corrosion resistant olive drab cadmium plated aluminum, 500 hour extended salt spray, EMI -50dB @ 10GHz specification min., 175°C
  - **RL** Corrosion resistant stainless steel, electro-deposited nickel, 48 hour salt spray, 175°C, non-firewall
  - **RK** Corrosion resistant stainless steel, fireproof capability, plus 500 hour salt spray resistance, EMI -45dB @ 10GHz specification min., 175°C
  - **DT** Durmalon plated, alternative to cadmium. Corrosion resistant, 500 hour extended salt spray EMI -50dB @ 10GHz specification min. without CR6
  - **DZ** Zinc-Nickel alternative to cadmium. Corrosion resistant, 500 hour salt spray, conductive, -65°C to +175°C

5. **Select a Contact Type**

- **Designates**
  - **P** Pin contacts
  - **S** Socket contacts

6. **Select an Alternate Position**

- **Designates**
  - **A**, **B**, **C**, **D**, **E**, or **blank** for normal.

7. **Select a PCB Contact Option**

- **Designates**
  - **PCB** tail stickout +/- .040 inch

- **Examples**
  - **P1** or **P1AD**
  - **S1** or **S1AD**
  - **P15** or **P15AD**
  - **S15** or **S15AD**
  - **P2** or **P2AD**
  - **S2** or **S2AD**
  - **P25** or **P25AD**
  - **S25** or **S25AD**
  - **P3** or **P3AD**
  - **S3** or **S3AD**
  - **P35** or **P35AD**
  - **S35** or **S35AD**

Note: Standard tail diameter is 0.019 ± .001

Stick out is measured from the end of the connector shell to end of the contact tail.
HD38999 High Density Connectors

Contacts & Tools, Technical Data,

Insert Availability

HD38999 series was designed to meet and/or exceed the specifications of MIL-DTL-38999. The connector series has been tested to all the requirements of 38999 with the use of AS39029 size 23 contacts. Test reports are available upon request. The following is a summary of some of the performance requirements.

**Technical Data**

**HD38999 Insert Availability**

High Density Shell Sizes (Front of Pin Insert Shown)
(all contacts are size 23)

**Contacts & Tools**

<table>
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<tr>
<th>Contact Part Numbers:</th>
<th>Crimp Barrel Dia:</th>
<th>Crimp Barrel Depth:</th>
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<td>Size 23 Sockets 10-597330-735 (M39029/17-172)</td>
<td>(Inches) .034-.036</td>
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<td>Size 23 Pins 10-597331-735 (M39029/18-177)</td>
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<td>Sealing Plugs 10-405996-222 (MS27488-22-2)</td>
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**Crimp Tool:** Daniels M22520/2-01
**Positioner:** Daniels M22520/2-16 Socket
**Insertion Tool:** Daniels M22520/2-13 Pin
**Removal Tool:** Daniels DK225-22
**Insertion/Removal Tool:** M81969/16-04 (Plastic)

**EMI Shielding Effectiveness:**
Solid metal-to-metal coupling, EMI grounding fingers and conductive finishes have proven to be the ultimate in EMI/EMP shielding effectiveness. The charts on page 24 illustrated shielding effectiveness data which is typical in HD38999 connectors as well as MIL-DTL-38999 connectors.

**Electrical:**
- 22 AWG: 5.0 AMPS
- 24 AWG: 3.0 AMPS
- 26 AWG: 2.0 AMPS
- 28 AWG: 1.5 AMPS

Insulation Resistance: 5000 megohms min. @500 VDC 25C
Dielectric Withstanding Voltage: 1000 VRMS @ sea level

**Environmental:**
- Operating Temperature: –65°C to +175°C
- Salt Spray: Electroless Nickel: 48 hours
  Metallized: Electroless Nickel: 48 hours
  Anodic Coating, O.D. Cadmium, Durmalon, Zinc Nickel: 500 hours
- Salt Spray Composite: Electroless Nickel: 1000 hours
  O.D. Cadmium, Durmalon, Zinc Nickel: 500 hours

**Mechanical:**
- Metallic Shells: Material: Aluminum Alloy, Stainless Steel
  Protection: Electroless Nickel, O.D. Cadmium, Durmalon (Nickel PTFE), Zinc Nickel
- Composite Shells: Material: Thermoplastic
  Protection: Electroless Nickel, O.D. Cadmium, Durmalon (Nickel PTFE), Zinc Nickel
- Contacts: Material: Copper Alloy
  Protection: Gold over Nickel
- Insert Retention to Shell: 100 psi in axial load
- Durability: 500 full mating and unmating cycles
- Vibration: 60G sine per MIL-DTL-38999L Para 4.5.23.2.1
  5G2 Random per EIA-364-28E, Test condition A
  1G2 Random per EIA-364-28E, Test condition I
- Shock: Per EIA-364-27B, 300g

**HD38999 Insert Availability**

Increased number of contacts in HD38999 insert pattern compared to Standard 38999* contact density of same shell size.
### HD38999 High Density Connectors

#### TVP00/CTVP00

Wall Mounting Receptacle

- **TVP00( ) - Crimp, Metal**
- **CTVP00( ) - Crimp, Composite**

See how to build a part number on pages 47.

† Red band indicates fully mated

†† Blue band indicates rear release contact retention system.

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#### TVP40/CTVP40

Wall Mounting Double Flange Receptacle

(Printed Circuit Board Mount)

- **TVP40( ) - Crimp, Metal**
- **CTVP40( ) - Crimp, Composite**

See how to build a part number on pages 47.

* Contact stickout: see Step 7 of how to order on page 47.

† Red band indicates fully mated

†† Blue band indicates rear release contact retention system.

<table>
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<tr>
<th>Shell</th>
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<th>A Dia. ±.005</th>
<th>B Thread Class 2A 0.1P-0.3L-9S (Plated)</th>
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<th>M +.005 -.005</th>
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<th>S Max.</th>
<th>S Max.</th>
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</table>
See how to build a part number on pages 47
† Red band indicates fully mated
†† Blue band indicates rear release contact retention system.

**See availablitly note below**
HD38999 High Density Connectors

TV07/CTV07

Jam Nut Receptacle

TV07( ) - Crimp, Metal
CTV07( ) - Crimp, Composite

See how to build a part number on pages 47
† Red band indicates fully mated
†† Blue band indicates rear release contact retention system.
★ .059 dia. min., 3 lockwire holes. Formed lockwire hole design (6 holes) is optional

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All dimensions for reference only

HD38999 High Density Connectors

TV97

Reduced Flange Jam Nut Receptacle

TV97( ) - Crimp, Metal

See how to build a part number on pages 47
† Red band indicates fully mated
†† Blue band indicates rear release contact retention system.

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<td>.016</td>
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<td>23 H</td>
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<td>.102</td>
<td>.0017</td>
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All dimensions for reference only
TV47( ) - Crimp, Metal
CTV47( ) - Crimp, Composite

See how to build a part number on pages 47
* Contact stickout dimension: see Step 7 of how to order on page 47.
† Red band indicates fully mated
†† Blue band indicates rear release contact retention system.
★ .059 dia. min., 3 lockwire holes. Formed lockwire hole design (6 holes) is optional

<table>
<thead>
<tr>
<th>Shell Size</th>
<th>MS Shell Size Code</th>
<th>B Thread Class 2A 0.1P-0.3L-TS (Plated)</th>
<th>C ±.005 (Jam Nut Flange Dia.)</th>
<th>D₁ ±.010 –.000</th>
<th>D₂ ±.000 –.010</th>
<th>H Hex ±.017 –.016</th>
<th>M Dia. ±.005</th>
<th>R Thread Metric (Plated)</th>
<th>S ±.011 –.010</th>
<th>PCB Mounting Dimensions</th>
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<tr>
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<td>.670</td>
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<td>.753 –.532</td>
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<td>M44X1-6g0.100R</td>
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<td>1.744 –1.233</td>
</tr>
</tbody>
</table>

All dimensions for reference only
HD38999 High Density Connectors

TV06/CTV06

Straight Plug

TV06( ) - Crimp, Metal
CTV06( ) - Crimp, Composite

This MIL-DTL-38999 Series III style connector features an integral backshell design that eliminates the need for costly backshell accessories. The backshell feature is incorporated into the rear of the connector shell, allowing the user to attach the shield of their cable directly to the connector. This provides superior EMI shielding and ease for overmold applications. The straight plug with integral backshell is available in aluminum shells with OD Cad or Electroless Nickel plating.

See how to build a part number on pages 47
† Blue band indicates rear release contact retention system.

<table>
<thead>
<tr>
<th>Shell Size</th>
<th>MS Shell Size Code</th>
<th>A Max.</th>
<th>B +.005 ~.000</th>
<th>C +.003 ~.002</th>
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<td>J</td>
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</table>
New Custom Designed HD38999 Connectors - Provide More Interconnect Solutions:

Alignment Disks
Alignment disks keep contacts aligned for easier insertion into circuit boards. These are typically ordered with the connector - see step 7 of How to Order on page 47.

Shell Size | D Dia. ± .010
--- | ---
9 | .234
11 | .350
13 | .500
15 | .725
17 | .750
19 | .850
21 | .953
23 | 1.147
25 | 1.250

HD38999 for Gigabit Ethernet Applications
The HD38999 is available for high speed (Gigabit Ethernet) data transmission in the size 9-9 insert pattern.

Data transmission performance of this connector insert:
• 10 Base T, 100 Base TX, and 1000 Base T networks using Cat 5e per TIA/EIA568B and Class D per ISO/IEC 11801.
  (Test report available - consult Amphenol Aerospace for more information)

Signal-Ground Pin Configuration
Wiring Recommendations

View Rear of Connector

HD38999 Connector with 9-9 Insert Pattern (Rear View)