Positronic Industries

Standard Density
Rectangular Connectors

For Direct Current, Low Frequency Analog and Digital High Speed Data Applications

RoHS Compliant options available!

Catalog C-009 Rev. D

www.connectpositronic.com
About Us

Founded in 1966, Positronic Industries is a vertically integrated manufacturer of high quality interconnect products. Positronic has earned the worldwide reputation as a service oriented, quick-reaction, top quality connector supplier. We are committed to maintaining this reputation by continuous implementation of our Complete Capability concept.

Complete Capability

Design & Development
- Designs new connectors and modifies existing connectors to meet industry requirements
- Continuously conducts marketing studies to identify industry needs for new products
- Ongoing interest in unique connector designs

Tooling
- Tooling support for all manufacturing areas within company
- Provides 80% of new tooling, punch press dies, molds, jigs and fixtures used at Positronic factory locations worldwide

Machining
- Automatic screw machines produce finely crafted contacts and hardware for connector bodies
- Trained technicians operate machines from Tornos, Bechler and Brown & Sharpe

Molding
- Molds all plastic connector components such as insulators, hoods, angle brackets and more
- Overmold capability available

Plating
- Applies gold and other metal finishes to connector components to any required thickness
- Plating conforms to all military specifications

Quality Assurance
- Select factories certified to ISO 9001:2000, AS9100 Rev.B 2004 and ISO 14001 (Singapore)
- Maintains aggressive TQM program
- Able to test to IEC, EIA, UL, MIL-DTL-24308, MIL-DTL-28748, SAE AS 39029 and MIL-C-85049 requirements

Finished Stock Inventory
- Each main factory location maintains a large inventory of connector components and accessories
- Same day shipments available on many standard connector products
- Stocking agreements available for qualified customers

Worldwide Sales & Service
- Responsive attitude toward customer needs
- Fully trained sales staff located worldwide
- Facilities located in USA, France, India, Puerto Rico, and Singapore.

Unless otherwise specified, dimensional tolerances are:

1) ±0.001 inches [0.03 mm] for male contact mating diameters.
2) ±0.003 inches [0.08 mm] for contact termination diameters.
3) ±0.005 inches [0.13 mm] for all other diameters.
4) ±0.015 inches [0.38 mm] for all other dimensions.

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CONNECTOR DESCRIPTIONS

GMCT SERIES CONNECTORS
Heavy duty, rectangular connectors with removable contacts. Multipurpose connectors offering power, signal and shielded contacts. Thirteen connector variants, 9 through 104 poles, qualified to MIL-DTL-28748.

GMCT SERIES CONTACTS
Size 16 contacts, 13 ampere nominal rated, and size 20 contacts, 7.5 ampere nominal rated, qualified to SAE AS 39029. Terminations are crimp 14 AWG [2.5mm²] through 32 AWG [0.03mm²], solder cup, wrap post, printed board, press-fit and shielded.

GAP SERIES CONNECTORS
Heavy duty, rectangular, printed board connectors with straight solder, size 16 contacts, 7.5 ampere nominal rated. Eight connector variants, 9 through 50 poles.

GAPL SERIES CONNECTORS
Heavy duty, rectangular, printed board mount connectors with size 16, right angle solder cup contacts, 7.5 ampere nominal rated. Seven connector variants, 9 through 50 poles.

VMCT AND VAPl SERIES CONNECTORS
Heavy duty, rectangular, CCITT V.35 recommended interface connectors with size 16 contacts, 13 ampere nominal rated. Terminations are crimp, solder cup, right angle printed board mount and press-fit.

GM SERIES CONNECTORS
Rectangular connectors with size 20 fixed solder contacts, 7.5 ampere nominal rated. Solder cup and printed board terminations. Eleven connector variants, 7 through 50 poles. Qualified to MIL-DTL-28748.

RoHS Compliant options available!
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GMCT Series connectors are heavy-duty, multi-pole, high reliability connectors qualified to MIL-DTL-28748 specifications. Termination styles are crimp, solder cup, straight solder, wrap post, press-fit, and crimp shielded. According to contact size selected, GMCT Series connectors are intermateable with Positronic GAP and GAPL series connectors.

Thirteen contact variants, 9 through 104 poles, are offered. Contacts can have 0.062 inch [1.57mm] diameters, rated to 13 amperes per contact, or have 0.040 inch [1.02mm] diameters, rated to 7.5 amperes per contact. GMCT Series crimp contacts are qualified to SAE AS 39029.

A wide array of mounting, locking, shrouding and polarizing accessories is available for this series. For details, see the Heavy-Duty Rectangular Connector Accessories section.

Due to its many termination styles, its wide range of contact variants, and an array of cable support accessories, GMCT Series connectors are widely utilized in navigational systems, robotics, mainframe and peripheral computers, medical equipment, telecommunications, instrumentation and process control applications.

**GMCT SERIES TECHNICAL CHARACTERISTICS**

**MILITARY SPECIFICATIONS:**
Qualified to MIL-DTL-28748/3 and MIL-DTL-28748/4. Contacts qualified to SAE AS 39029/34 and SAE AS 39029/35.

**UNDERWRITERS LABORATORY RECOGNIZED:**
File No. E49351.

**INTERNATIONAL STANDARDS:**
IEC 807-7.
U.L. Recognized.

**MATERIALS AND FINISHES:**
- **Insulator:** Glass filled DAP per ASTM-D-5948 type SDG-F. Grey color is standard, black available.
- **Removable Contacts:** Copper alloy, gold flash over nickel. Military contacts plated 0.000050 inch [1.27 microns] gold over copper. Other finishes available upon request.
- **Hoods, Cable Adapters:** Aluminum with yellow or black anodize.
- **Shells:** Aluminum with yellow or black anodize.
- **Jackscrew System:** Passivated stainless steel.
- **Polarizing Guides:** Copper alloy with nickel plate or passivated stainless steel.
- **Vibration Locks:** Copper alloy with zinc plate and chrome seal.

**MECHANICAL CHARACTERISTICS:**
- **Removable Contacts:** Insert contact to rear face of insulator, release from front face of insulator. Both size 16 [13 amps] and size 20 [7.5 amps] contacts available. Female contact has “closed entry” design for highest reliability.
- **Contact Retention in Insulator:** 20 lbs. [89N] after 10 cycles of contact insertion/extraction.
- **Contact Termination:** Crimp all wire sizes from 14 AWG [2.5 mm²] through 28 AWG [0.08 mm²]. Also, solder cup, press-fit, wrap post and solder printed board terminations. Also, crimp and shielded contacts.

**ELECTRICAL CHARACTERISTICS:**
- **Contact Current Rating (maximum):**
  - Size 16: 0.062 inch [1.57 mm] diameter. - 13 amps maximum.
  - Size 20: 0.040 inch [1.02 mm] diameter. - 7.5 amps maximum.
- **Initial Contact Resistance:**
  - Size 16 – 0.003 ohms.
  - Size 20 – 0.007 ohms.
- **Flash over Voltage:**
  - Size 16 - 2700 V.AC [rms].
  - Size 20 - 1200 V.AC [rms].
- **Insulation Resistance (minimum):**
  - 5 G ohms.
- **Clearance and Creepage Distance (minimum):**
  - 0.080 inch [2.03 mm].
- **Working Temperature:**
  - -65°C to 150°C.
- **Working Voltage:**
  - 500 V.AC [rms].
- **Coaxial Contacts:**
  - **Characteristic Impedance:** 50 ohms.
  - **Initial Contact Resistance:** 0.012 ohms max.

For RoHS options see page 21.
GMCT SERIES

HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS

TYPICAL MATING ASSEMBLIES
PICTURES ARE 80% OF ACTUAL SIZE

GMCT26F0E100JB

GAP26MDS4T0000

GMCT34F00RAZ0

GMCT34M0TWA00

CONNECTOR MATING DIMENSIONS

P: 0.276 [7.01] MINIMUM PENETRATION OF MALE CONTACT IN “CLOSED ENTRY” DESIGN FEMALE CONTACT TO ENSURE MINIMUM CONTACT RESISTANCE.

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS

GMCT SERIES

EXPLODED VIEWS OF TYPICAL MATED CONNECTOR ASSEMBLIES

GMCT14F0G000V
GMCT14M0G00JVLB
GAPL50F0T0LB
GMCT20F0E1PBJ0
GMCT20M0TUB00
GMCT34F0T0000
GMCT34M00P0Z0
GMCT50M0000Y0

SET SCREW OPTIONAL

GMCT SERIES

Standard Density Rectangular
**CONNECTOR COMPONENT DESCRIPTION AND TERMINOLOGY**

**A** - Male and female contacts, size 16 and size 20. Power, signal and shielded. Terminations are crimp, solder cup, wrap post, printed board straight solder and press-fit.

**B1** - Unloaded connector insulators, male and female. Insulator retention system retains all contact termination types. Insulator may be used as a free or fixed connector.

**B2** - Loaded connector insulators, male and female. Insulators may be preloaded per customer requirements with contacts having terminations of 90° or straight solder printed board mount, wrap post and press-fit. Insulator contact positions may be selectively loaded with contacts. Unloaded insulator contact positions remain unloaded and reserved for future use. Connectors are normally fixed panel or printed board connectors.

**C1** - Polarizing guides, male and female, ensure correct alignment and coupling of male and female connectors. They may also be used for keying when used in corner positions of connector variants 34, 42, 50, 60, 66, 75 and 104 poles.

**C2** - Fixed jackscrews are the stationary threaded members of the jackscrew system. Threaded pilots and sockets of the jackscrew system also provide connector polarization to ensure correct connector coupling.

**C3** - Long turnable jackscrews, the rotating threaded members of the jackscrew system, are used with a free connector having a hood for cable support. Used on connector variants 9, 14, 18, 20, 21, 26 and 41 poles. Knobs, C-12, may be affixed to turnable jackscrews using either roll pins or set screws.

**C4** - Short turnable jackscrews are used to polarize and mechanically assist with the coupling of the male and female connectors when the free connector is not equipped with a hood.

**C5** - Long turnable jackscrews, factory assembled to hood (cable adapter) for polarization and mechanical assistance in the coupling of the free connector to the fixed connector. Used on connector variants 34, 42, 50, 60, 66, 75 and 104 poles.

**C6** - Vibration locking system consists of lock tabs on fixed connector and locking levers on free cable connectors. Normally used on connector variants 7, 9, 14, 18, 20, 21 and 26 poles. Locks connectors in coupled position.

**C7** - Hoods (cable adapters) are used on the free connector to provide cable support and contact protection. May also mechanically support either the turnable or fixed members of the jackscrew system.

**C8** - Side access hoods (cable adapters). Extra strength, quick cable assembly to connector, fixed or free, to provide cable support and relieve stress on contact termination. Supplied with both turnable and fixed jackscrew systems.

**C9** - Shells (shrouds), both male and female, protect male and female contacts from damage. Also used to provide additional polarization combinations.

**C10** - Mounting plates, with or without float bushings, provide a stronger mechanical method of mounting the fixed connector to a panel. May be used with shells.

**C11** - Mounting angle brackets provide a means of mechanically affixing the fixed connector to the printed board.

**C12** - Knobs of turnable jackscrews may be affixed to the jackscrews by using either the roll pin or set screw method. Specify method desired in step 9 of order numbering system.

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**INSULATOR DIMENSIONS**

**MATING FACE OF FEMALE CONNECTOR OR REAR FACE OF MALE CONNECTOR**

---

**DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.**
HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS

INSULATOR DIMENSIONS

MATING FACE OF FEMALE CONNECTOR OR REAR FACE OF MALE CONNECTOR

GMCT 41

GMCT 42

GMCT 50

GMCT 60*

GMCT 66

GMCT 75

GMCT 104

*CONTACT TECHNICAL SALES FOR U.L. APPROVAL STATUS OF GMCT60 VARIANT.

MATERIAL: GLASS FILLED DIALYL PHTHALATE PER ASTM-D-5948 TYPE SDG-F

SEE GMCT SERIES PRINTED BOARD HOLE PATTERN PAGE FOR CONNECTOR VARIANT CONTACT HOLE POSITIONS

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
### INSULATOR DIMENSIONS

**MATERIAL:** GLASS FILLED Diallyl Phthalate per ASTM-D-5948 Type SDG-F

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<td>0.525</td>
<td>0.370</td>
<td>1.672</td>
<td>2.312</td>
</tr>
<tr>
<td></td>
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<td>[13.34]</td>
<td>[9.40]</td>
<td>[42.47]</td>
<td>[58.72]</td>
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<tr>
<td>GMCT50F</td>
<td>2</td>
<td>0.856</td>
<td>0.370</td>
<td>1.972</td>
<td>2.718</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[21.74]</td>
<td>[9.40]</td>
<td>[50.09]</td>
<td>[69.04]</td>
</tr>
<tr>
<td>GMCT50M</td>
<td>2</td>
<td>0.511</td>
<td>0.370</td>
<td>1.972</td>
<td>2.718</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[12.98]</td>
<td>[9.40]</td>
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<td>[69.04]</td>
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<tr>
<td>GMCT60F</td>
<td>1</td>
<td>0.856</td>
<td>0.370</td>
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</tr>
<tr>
<td></td>
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<td>[21.74]</td>
<td>[9.40]</td>
<td>[52.02]</td>
<td>[69.85]</td>
</tr>
<tr>
<td>GMCT60M</td>
<td>1</td>
<td>0.511</td>
<td>0.370</td>
<td>2.048</td>
<td>2.750</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[12.98]</td>
<td>[9.40]</td>
<td>[52.02]</td>
<td>[69.85]</td>
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<td>0.370</td>
<td>1.673</td>
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<tr>
<td></td>
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<td>[21.74]</td>
<td>[9.40]</td>
<td>[42.49]</td>
<td>[57.94]</td>
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<tr>
<td>GMCT66M</td>
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<td>0.525</td>
<td>0.370</td>
<td>1.673</td>
<td>2.281</td>
</tr>
<tr>
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<td>[13.34]</td>
<td>[9.40]</td>
<td>[42.49]</td>
<td>[57.94]</td>
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<tr>
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<td>0.856</td>
<td>0.370</td>
<td>1.980</td>
<td>2.718</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[21.74]</td>
<td>[9.40]</td>
<td>[50.29]</td>
<td>[69.04]</td>
</tr>
<tr>
<td>GMCT75M</td>
<td>2</td>
<td>0.511</td>
<td>0.370</td>
<td>1.980</td>
<td>2.718</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[12.98]</td>
<td>[9.40]</td>
<td>[50.29]</td>
<td>[69.04]</td>
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<tr>
<td>GMCT104F</td>
<td>1</td>
<td>0.856</td>
<td>0.370</td>
<td>2.048</td>
<td>2.750</td>
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<tr>
<td></td>
<td></td>
<td>[21.74]</td>
<td>[9.40]</td>
<td>[52.02]</td>
<td>[69.85]</td>
</tr>
<tr>
<td>GMCT104M</td>
<td>1</td>
<td>0.511</td>
<td>0.370</td>
<td>2.048</td>
<td>2.750</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[12.98]</td>
<td>[9.40]</td>
<td>[52.02]</td>
<td>[69.85]</td>
</tr>
</tbody>
</table>

**DIMENSIONS ARE IN INCHES [MILLIMETERS].**

**ALL DIMENSIONS ARE SUBJECT TO CHANGE.**
HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS

CONTACT HOLE POSITION DIMENSIONS AND PRINTED BOARD HOLE PATTERN
FOR STRAIGHT SOLDER CONTACTS AND COMPLIANT TERMINATION PRESS-FIT CONTACTS
MATING FACE OF FEMALE CONNECTOR OR REAR FACE OF MALE CONNECTOR

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS

CONTACT HOLE POSITION DIMENSIONS AND PRINTED BOARD HOLE PATTERN
FOR STRAIGHT SOLDER CONTACTS AND COMPLIANT TERMINATION PRESS-FIT CONTACTS
MATING FACE OF FEMALE CONNECTOR OR REAR FACE OF MALE CONNECTOR

HOLE IDENTIFICATION FOR REFERENCE ONLY

SUGGEST 0.120 [3.05] Ø HOLES IN PRINTED BOARD FOR CONNECTOR MOUNTING HOLES
FOR CONNECTOR VARIANTS 9 THROUGH 50, 66 AND 75. SUGGEST 0.149 [3.78] Ø HOLES
IN PRINTED BOARD FOR CONNECTOR MOUNTING HOLES FOR CONNECTOR VARIANTS
60 AND 104.

SUGGEST 0.040 [1.02] Ø HOLES IN PRINTED BOARD FOR GMCT SERIES STRAIGHT
SOLDER CONTACTS

SUGGESTED PRINTED BOARD HOLE SIZES FOR COMPLIANT TERMINATION PRESS-FIT
CONTACTS, SEE PAGE 13.

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
All contacts of the GMCT series connector family utilize the “Large Surface Area (L.S.A.) Contact Mating System.” The “L.S.A. Contact Mating System” insures the lowest level of contact resistance during mechanical endurance tests of 1000 coupling cycles or more. Contact insertion/withdrawal forces remain substantially the same during the life of the connector.

The GMCT series uses only “Closed Entry” design female contacts. The “Closed Entry” design prevents probe damage to the female contacts, and will not allow the female contact to accept misaligned or bent male contacts.

All GMCT series contacts are precision machined from solid, copper alloy barstock. They are durable, smooth in construction, and have greater amperage capacities than hollow, sheet metal style contacts. This is graphically illustrated by the amperage-temperature rise curves developed for the 34 pole GMCT insulator using 16 AWG [1.5 mm²] wire [see diagram page 10]. The precision machined, removable contact also has a more durable insulator retention system than the hollow, sheet metal style contact. After ten removal cycles from its insulator, the precision machined contact will withstand axial forces in excess of 20 lbs. [89N]. In comparison, the hollow, sheet metal style contact is limited to 10 lbs. [44.5N] after ten removal cycles from its insulator retention system.
HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS

CURRENT-TEMPERATURE DERATING CURVE

(TESTED PER IEC PUBLICATION 512-3, TEST 5b)

34 POLE CONNECTOR WITH CLOSED CRIMP BARREL CONTACTS (MACHINED COPPER ALLOY)

CURVE DEVELOPED USING SIZE 16 CONTACT WITH 16 AWG (1.5 mm²) SIZE WIRE

TEMPERATURE RISE CURVE

34 POLE CONNECTOR WITH CLOSED CRIMP BARREL CONTACTS (MACHINED COPPER ALLOY)
HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS

CRIMP CONTACTS
CLOSED CRIMP BARREL WITH INSULATION GRIP (SUPPORT)
PRECISION MACHINED, SOLID COPPER ALLOY

FEMALE CONTACT ("CLOSED ENTRY" DESIGN)

MALE CONTACT

POWER AND SIGNAL CONTACTS

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>WIRE SIZE AWG/(mm²)</th>
<th>A</th>
<th>B</th>
<th>NOMINAL RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC114N</td>
<td>14 / 16 [2.5/1.5]</td>
<td>0.081</td>
<td>0.105</td>
<td>13 AMP</td>
</tr>
<tr>
<td>FC116N</td>
<td>16 / 18 [1.5/1.0]</td>
<td>0.067</td>
<td>0.093</td>
<td>13 AMP</td>
</tr>
<tr>
<td>FC120N</td>
<td>20 / 22 / 24 [0.5/0.3/0.25]</td>
<td>0.045</td>
<td>0.065</td>
<td>13 AMP</td>
</tr>
<tr>
<td>FC124N</td>
<td>24 / 26 / 28 [0.25/0.12/0.08]</td>
<td>0.027</td>
<td>0.055</td>
<td>13 AMP</td>
</tr>
<tr>
<td>FC126N</td>
<td>26 / 28 / 30 / 32 [0.12-0.03]</td>
<td>0.025</td>
<td>0.046</td>
<td>13 AMP</td>
</tr>
<tr>
<td>FC216N</td>
<td>16 / 18 [1.5/0.8]</td>
<td>0.067</td>
<td>0.093</td>
<td>7.5 AMP</td>
</tr>
<tr>
<td>FC220N</td>
<td>20 / 22 / 24 [0.5/0.3/0.25]</td>
<td>0.045</td>
<td>0.065</td>
<td>7.5 AMP</td>
</tr>
<tr>
<td>FC224N</td>
<td>24 / 26 / 28 [0.25/0.12/0.08]</td>
<td>0.027</td>
<td>0.055</td>
<td>7.5 AMP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>WIRE SIZE AWG/(mm²)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>NOMINAL RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC114N</td>
<td>14 / 16 [2.5/1.5]</td>
<td>0.081</td>
<td>0.105</td>
<td>0.062</td>
<td>13 AMP</td>
</tr>
<tr>
<td>MC116N</td>
<td>16 / 18 [1.5/1.0]</td>
<td>0.067</td>
<td>0.093</td>
<td>0.062</td>
<td>13 AMP</td>
</tr>
<tr>
<td>MC120N</td>
<td>20 / 22 / 24 [0.5/0.3/0.25]</td>
<td>0.045</td>
<td>0.065</td>
<td>0.062</td>
<td>13 AMP</td>
</tr>
<tr>
<td>MC124N</td>
<td>24 / 26 / 28 [0.25/0.12/0.08]</td>
<td>0.027</td>
<td>0.055</td>
<td>0.062</td>
<td>13 AMP</td>
</tr>
<tr>
<td>MC126N</td>
<td>26 / 28 / 30 / 32 [0.12-0.03]</td>
<td>0.025</td>
<td>0.046</td>
<td>0.062</td>
<td>13 AMP</td>
</tr>
<tr>
<td>MC216N</td>
<td>16 / 18 [1.5/0.8]</td>
<td>0.067</td>
<td>0.093</td>
<td>0.040</td>
<td>7.5 AMP</td>
</tr>
<tr>
<td>MC220N</td>
<td>20 / 22 / 24 [0.5/0.3/0.25]</td>
<td>0.045</td>
<td>0.065</td>
<td>0.040</td>
<td>7.5 AMP</td>
</tr>
<tr>
<td>MC224N</td>
<td>24 / 26 / 28 [0.25/0.12/0.08]</td>
<td>0.027</td>
<td>0.055</td>
<td>0.040</td>
<td>7.5 AMP</td>
</tr>
</tbody>
</table>

MATERIAL: COPPER ALLOY FINISH:
GOLD FLASH OVER NICKEL

CONTACTS ARE NOT SUPPLIED WITH CONNECTOR
AND MUST BE ORDERED SEPARATELY

For GMCT crimping information, see page 16 and 17.

Additional plating options available by adding suffix to part number
add -14 for 0.000030 [0.76 microns] gold over nickel. Example: FC220N2-14
add -50 for 0.000050 [1.27 microns] gold over copper. Example: MC120N-50

REELS FOR AUTOMATIC CRIMP TOOLS

REELED CONTACTS
Contacts may be supplied on plastic carriers, packaged on reels of 2,000 contacts for use with bench mounted automatic strip and crimp tool part number 9550-0 for contact sizes 14 AWG [2.5 mm²] through 24 AWG [0.25 mm²] or part number 9550-1 for contact size 26 AWG [0.12 mm²]. The same type carrier is used for both male and female contacts of the same size and type, and requires no change in crimping tool.

All male and female crimp style contacts can be ordered in reels by adding the letter “R” after the contact part number, such as MC116NR for a male contact and FC120N2R for a female contact. Wire sizes 14 AWG [2.5 mm²] to 28 AWG [0.08 mm²] can be accommodated by the crimping.
SOLDER CUP CONTACTS

**FEMALE CONTACT**

“CLOSED ENTRY” DESIGN

**MALE CONTACT**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>WIRE SIZE MAX.</th>
<th>A</th>
<th>B</th>
<th>NOMINAL RATING</th>
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</thead>
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<tr>
<td>FS114N2</td>
<td>14 AWG [2.5 mm²]</td>
<td>0.081 [2.06]</td>
<td>0.105 [2.67]</td>
<td>13 AMP</td>
</tr>
<tr>
<td>FS116N2</td>
<td>16 AWG [1.5 mm²]</td>
<td>0.067 [1.70]</td>
<td>0.093 [2.36]</td>
<td>13 AMP</td>
</tr>
<tr>
<td>FS120N2</td>
<td>20 AWG [0.5 mm²]</td>
<td>0.045 [1.14]</td>
<td>0.065 [1.65]</td>
<td>13 AMP</td>
</tr>
<tr>
<td>FS124N2</td>
<td>24 AWG [0.25 mm²]</td>
<td>0.027 [0.69]</td>
<td>0.055 [1.40]</td>
<td>13 AMP</td>
</tr>
<tr>
<td>FS161N2</td>
<td>16 AWG [1.5 mm²]</td>
<td>0.067 [1.70]</td>
<td>0.093 [2.36]</td>
<td>7.5 AMP</td>
</tr>
<tr>
<td>FS22O2N2</td>
<td>20 AWG [0.5 mm²]</td>
<td>0.045 [1.14]</td>
<td>0.065 [1.65]</td>
<td>7.5 AMP</td>
</tr>
<tr>
<td>FS224N2</td>
<td>24 AWG [0.25 mm²]</td>
<td>0.027 [0.69]</td>
<td>0.055 [1.40]</td>
<td>7.5 AMP</td>
</tr>
</tbody>
</table>

**MATERIAL:** COPPER ALLOY

**FINISH:** GOLD FLASH OVER NICKEL

*CONTACTS ARE NOT SUPPLIED WITH CONNECTORS AND MUST BE ORDERED SEPARATELY*

**ADDITIONAL PLATING OPTIONS AVAILABLE BY ADDING SUFFIX TO PART NUMBER**

- Add -14 for 0.000030 [0.76 microns] gold over nickel. Example: FS220N2-14
- Add -50 for 0.000050 [1.27 microns] gold over copper. Example: MS120N-50

**MILITARY CRIMP CONTACTS**

**QUALIFIED TO SAE AS 39029/34 AND SAE AS 39029/35**

**FEMALE CONTACT**

“CLOSED ENTRY” DESIGN

**MALE CONTACT**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>A</th>
<th>B</th>
<th>COLOR CODE</th>
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<tr>
<td>M39029/34-274</td>
<td>0.045 [1.14]</td>
<td>0.068 [1.73]</td>
<td>RED/ VIOLET/ YELLOW</td>
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<td>M39029/34-275</td>
<td>0.045 [1.14]</td>
<td>0.068 [1.73]</td>
<td>RED/ VIOLET/ GREEN</td>
</tr>
<tr>
<td>M39029/34-276</td>
<td>0.067 [1.70]</td>
<td>0.093 [2.36]</td>
<td>RED/ VIOLET/ BLUE</td>
</tr>
</tbody>
</table>

**MATERIAL:** COPPER ALLOY

**FINISH:** 0.000050 [1.27 MICRONS] GOLD OVER COPPER

**DIMENSIONS ARE IN INCHES [MILLIMETERS].**

ALL DIMENSIONS ARE SUBJECT TO CHANGE.
SUGGESTED PRINTED BOARD HOLE SIZES FOR COMPLIANT PRESS-FIT CONNECTORS

Traditionally, tin-lead has been a popular plating for PBC holes. However, many PCB hole platings must now be RoHS Compliant. Positronic is pleased to offer PCB HOLE SIZE FOR RoHS PCB plating as shown below.

<table>
<thead>
<tr>
<th>BOARD TYPE</th>
<th>CONTACT SIZE/TYPE</th>
<th>RECOMMENDED DRILL HOLE SIZE</th>
<th>RECOMMENDED PLATING</th>
<th>FINISHED HOLE SIZES</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIN-LEAD SOLDER PCB</td>
<td>16 BI-SPRING</td>
<td>ø0.069±0.001 [ø1.750±0.025]</td>
<td>0.0006 [15µ] minimum solder over 0.0010 [25µ] min. copper</td>
<td>ø0.0630+0.0035-0.0024 [ø1.600+0.090-0.060]</td>
</tr>
<tr>
<td>COPPER PCB</td>
<td>16 BI-SPRING</td>
<td>ø0.069±0.001 [ø1.750±0.025]</td>
<td>0.0010 [25µ] min. copper</td>
<td>ø0.0630+0.0035-0.0024 [ø1.600+0.090-0.060]</td>
</tr>
<tr>
<td>IMMERSION TIN PCB</td>
<td>16 BI-SPRING</td>
<td>ø0.069±0.001 [ø1.750±0.025]</td>
<td>0.000003±0.000006 [0.85±15µ] immersion tin over 0.0010 [25µ] min. copper</td>
<td>ø0.0630+0.0035-0.0024 [ø1.600+0.090-0.060]</td>
</tr>
<tr>
<td>IMMERSION SILVER PCB</td>
<td>16 BI-SPRING</td>
<td>ø0.069±0.001 [ø1.750±0.025]</td>
<td>0.000013±0.000007 [0.34±0.17µ] immersion silver over 0.0010 [25µ] min. copper</td>
<td>ø0.0630+0.0035-0.0024 [ø1.600+0.090-0.060]</td>
</tr>
<tr>
<td>ELECTROLESS NICKEL / IMMERSION GOLD PCB</td>
<td>16 BI-SPRING</td>
<td>ø0.069±0.001 [ø1.750±0.025]</td>
<td>0.000002 [0.05µ] min. immersion gold over 0.00017±0.000059 [4.5±15µ] electroless nickel per IPC-4552 over 0.0010 [25µ] min. copper</td>
<td>ø0.0630+0.0035-0.0024 [ø1.600+0.090-0.060]</td>
</tr>
</tbody>
</table>
HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS

STRAIGHT SOLDER CONTACTS
PRECISION MACHINED, SOLID COPPER ALLOY

FEMALE CONTACT “CLOSED ENTRY” DESIGN

MATERIAL: COPPER ALLOY
FINISH: GOLD FLASH OVER NICKEL

CONSULT TECHNICAL SALES FOR CONTACTS OF DIFFERENT LENGTHS AND TAIL DIAMETERS
UNLESS SPECIFIED OTHERWISE, STRAIGHT SOLDER CONTACTS ARE NOT SUPPLIED WITH CONNECTORS AND MUST BE ORDERED SEPARATELY
CONTACTS MAY BE INSTALLED IN CONNECTOR TO CUSTOMER ORDER

PART NUMBER | A | B
---|---|---
FDS125N2 | 0.950 [24.13] | 0.125 [3.18]
FDS156N2 | 0.981 [24.92] | 0.156 [3.96]
FDS187N2 | 1.012 [25.70] | 0.187 [4.75]

ADDITIONAL PLATING OPTIONS AVAILABLE BY ADDING SUFFIX TO PART NUMBER
ADD -14 FOR 0.000030 [0.76 MICRONS] GOLD OVER NICKEL. EXAMPLE: FDS156N2-14
ADD -50 FOR 0.000050 [1.27 MICRONS] GOLD OVER COPPER. EXAMPLE: MDS187N-50

WRAP POST CONTACTS
PRECISION MACHINED, SOLID COPPER ALLOY

FEMALE CONTACT “CLOSED ENTRY” DESIGN

CONTACTS ARE NOT SUPPLIED WITH CONNECTOR AND MUST BE ORDERED SEPARATELY

PART NUMBER | A | B | C | D
---|---|---|---|---
FW814N2 | 1.335 [33.91] | 0.695 [17.65] | 0.025 [0.64] | 0.500 [12.70]
FW845N2 | 1.335 [33.91] | 0.695 [17.65] | 0.045 [1.14] | 0.500 [12.70]

ORDER POSITIONER 9167-1 WITH THE 0.025 SQ. CONTACT AND 9167-2 WITH THE 0.045 SQ. CONTACT

CONSULT TECHNICAL SALES FOR CONTACTS OF DIFFERENT TAIL LENGTHS
CONSULT TECHNICAL SALES FOR NYLON POSITIONER INSTALLATION TOOL

ADDITIONAL PLATING OPTIONS AVAILABLE BY ADDING SUFFIX TO PART NUMBER
ADD -14 FOR 0.000030 [0.76 MICRONS] GOLD OVER NICKEL. EXAMPLE: FW814N2-14
ADD -50 FOR 0.000050 [1.27 MICRONS] GOLD OVER COPPER. EXAMPLE: MW845N-50

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS

CRIMP SHIELDED CONTACTS

MATERIALS AND FINISHES:
Insulating Material: (Dielectric) PCTFE.
Inner Contacts: Phosphor bronze, 0.000030 inch [0.75 microns] gold over nickel.
Outer Contacts: Brass and beryllium copper, gold flash over nickel. Other finishes available upon request.

MECHANICAL CHARACTERISTICS:*
Contact Retention
In Insulator: 20 lbs. [89N].
Removable Contacts: Rear insertion, front removable.
Insertion Force Per Contact: 8 oz. [2.2N] per contact maximum.
Durability: 100 cycles minimum.
Vibration: 20g from 10 HZ to 500 HZ.
Shock: 30g - 11 ms.

ELECTRICAL CHARACTERISTICS:

<table>
<thead>
<tr>
<th>CONTACT DESIGNATION</th>
<th>PART NUMBER</th>
<th>A</th>
<th>B Ø</th>
<th>CABLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE</td>
<td>MCS126N</td>
<td>0.993 [25.22]</td>
<td>0.045 [1.14]</td>
<td>RG 178 B/U, RG 196 A/U</td>
</tr>
<tr>
<td>FEMALE</td>
<td>FCS126N2</td>
<td>0.967 [24.56]</td>
<td>0.045 [1.14]</td>
<td>RG 178 B/U, RG 196 A/U</td>
</tr>
<tr>
<td>FEMALE</td>
<td>FCS226N2</td>
<td>1.022 [25.96]</td>
<td>0.070 [1.78]</td>
<td>RG 179 B/U, RG 316 A/U</td>
</tr>
</tbody>
</table>

SHIELDED CABLE STRIP LENGTH

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
CRIMPING INFORMATION FOR GMCT SERIES CRIMP CONTACTS
USE INDICATED POSITRONIC TOOLS FOR BEST RESULTS

**Step 1:** Strip wire to indicated length.

**Take Care Not To:**
- Damage or remove strands.
- Untwist or overtwist strands.
- Leave insulation particles on strands.
- Damage insulation.

**Examples of Stripping Faults**

- Strands damaged or removed by stripping tool.
- Insulation cut incorrectly.
- Strands untwisted.
- Strands overtwisted.
- Particles of insulation on the stripped part of the wire.
- Wire insulation damaged.

**Step 2:** Crimp wire to contact.

**For Hand Crimp Tool:**
- Place contact into crimping tool.
- Insert wire into contact.
- Center contact by slowly closing the crimping tool until the crimp indenters make contact with the crimp barrel.
- Complete the cycle of the crimping tool in one smooth motion.
- Remove the crimped contact.

**For Automatic Crimp Tool:**
- Insert the wire into the contact, positioned in the crimp tool by the plastic carrier.
- Depress the activating device of the crimping tool to start the crimping cycle.
- Remove the crimped contact.

**DIMENSIONS ARE IN INCHES [MILLIMETERS].**
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS

CRIMPING INFORMATION FOR GMCT SERIES CRIMP CONTACTS

Step 3: Inspect the crimp.

For All Tools:
- Strands to be visible through the inspection hole.
- Strands not to be visible beyond the insulation support.
- Crimped contact to meet recommended conductor tensile force shown in chart.
- Check for peeled gold and bent contacts.

Correctly Crimped Contact

Wire Insulation, Typical

Crimp to meet recommended tensile strength.

Correctly Crimped Contact

Cross Section of Correctly Crimped Contact

Stripped wires compressed for improved conduction.

Stripped part of the wire too long.

Examples of Crimping Faults

Examples of Crimping Faults

Stripped part of the wire too short.

Crimp indents incorrectly located.

Positronic Recommended Conductor Tensile Strength

<table>
<thead>
<tr>
<th>WIRE SIZE AWG[mm²]</th>
<th>AXIAL LOAD POUNDS[N]</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 [2.5]</td>
<td>70 [311]</td>
</tr>
<tr>
<td>16 [1.5]</td>
<td>60 [222]</td>
</tr>
<tr>
<td>18 [1.0]</td>
<td>28 [125]</td>
</tr>
<tr>
<td>20 [0.5]</td>
<td>20 [89]</td>
</tr>
<tr>
<td>22 [0.3]</td>
<td>12 [53]</td>
</tr>
<tr>
<td>24 [0.25]</td>
<td>8 [36]</td>
</tr>
<tr>
<td>26 [0.12]</td>
<td>5 [22]</td>
</tr>
<tr>
<td>28 [0.08]</td>
<td>3 [10]</td>
</tr>
</tbody>
</table>

POSITRONIC RECOMMENDED TOOLS

<table>
<thead>
<tr>
<th>TOOL TYPE</th>
<th>CONTACT SIZE AWG [mm²]</th>
<th>TOOL NUMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTOMATIC CRIMP TOOL:</td>
<td>14-24 [2.5-0.25]</td>
<td>9550-0-0-0</td>
</tr>
<tr>
<td></td>
<td>26-28 [0.12-0.08]</td>
<td>9550-1-0-0</td>
</tr>
<tr>
<td>HAND CRIMP TOOL:</td>
<td>14-24 [2.5-0.25]</td>
<td>9501-0-0-0 WITH 9502-1-0-0 POSITIONER</td>
</tr>
<tr>
<td></td>
<td>26-28 [0.12-0.08]</td>
<td>9507-0-0-0 WITH 9502-18-0-0 POSITIONER</td>
</tr>
<tr>
<td>INSERTION TOOL:</td>
<td>N/A</td>
<td>9099-0-0-0</td>
</tr>
<tr>
<td>EXTRACTION TOOL:</td>
<td>N/A</td>
<td>9081-0-0-0</td>
</tr>
</tbody>
</table>

Conductor tensile strength values are derived using silver-tin plated copper wires. Values may change depending upon what type of wire is used.
HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS

CYCLE-CONTROLLED STEP ADJUSTABLE HAND CRIMP TOOL

**M22520/1-01
**Part No. 9501-0-0-0

Features of this positive ratchet action tool include accommodations for wire sizes 14 AWG [2.5 mm²] through 28 AWG [0.08 mm²] and eight (8) impression crimp on wires and contacts of various compositions. Required for use with this basic tool is the turret head part number 9502-1-0-0.

CONTACT CARRIERS FOR AUTOMATIC CRIMP TOOL

Molded thermoplastic carriers in a continuous belt feed contacts to the crimp station of the automatic crimp tool. They also locate the contacts in respect to the tool’s indenters. The carriers are color coded red, blue, yellow, green, orange or natural for contact identification for both MS and proprietary applications.

AUTOMATIC CRIMP TOOL, PNEUMATICALLY ACTUATED

Part No. 9550-0-0-0

This fast cycling automatic crimp tool produces an 8 indent crimp on wire sizes 14 AWG [2.5 mm²] through 28 AWG [0.08 mm²].

*To order, specify part number 9550-0-0-0. Foot control valve is supplied as a standard accessory.

*Specify part number 9550-1-0-0 for FC126N2 and MC126N contacts only for automatic feed crimp tool.

**Specify part number 9507-0-0-0 crimp tool and 9502-18-0-0 positioner for cycle controlled step adjustable hand crimp tool for FC126N2 and MC126N contacts only.
CONTACT INSERTION TOOL
Part No. 9099-0-0-0

An easy-to-use contact insertion tool for 14 AWG [2.5 mm²] and smaller wires. See photographic demonstration shown below for recommended insertion procedure.

CONTACT EXTRACTION TOOL
Part No. 9081-0-0-0

The spring loaded contact extraction tool simplifies the extraction of removable contacts from the connector insulators. Simply insert the hollow tool tip over the male or female contact from the front face of the insulator, rotate the tool slightly while increasing the pushing force against the butt of the extraction tool. The contact will be released from the insulator retention system and “pop out” of the rear face of the insulator. See photo below for recommended removal procedure.
## REMOVABLE CONTACT ORDERING ASSISTANCE CHART

### GMCT SERIES CRIMP AND SOLDER CUP CONTACT TERMINATIONS

<table>
<thead>
<tr>
<th>TERMINATION TYPE</th>
<th>CONTACT FUNCTION</th>
<th>CONTACT SIZE</th>
<th>WIRE SIZE</th>
<th>MALE PART NUMBER</th>
<th>FEMALE PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CRIMP</strong></td>
<td>POWER</td>
<td>16</td>
<td>14 AWG [2.5 mm²] - 16 AWG [1.5 mm²]</td>
<td>MC114N</td>
<td>FC114N2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
<td>16 AWG [1.5 mm²] - 18 AWG [1.0 mm²]</td>
<td>MC116N</td>
<td>FC116N2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>16 AWG [1.5 mm²] - 18 AWG [1.0 mm²]</td>
<td>MC216N</td>
<td>FC216N2</td>
</tr>
<tr>
<td></td>
<td>SIGNAL</td>
<td>16</td>
<td>20 AWG [0.5 mm²] - 24 AWG [0.25 mm²]</td>
<td>MC120N</td>
<td>FC120N2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>20 AWG [0.5 mm²] - 28 AWG [0.08 mm²]</td>
<td>MC126N</td>
<td>FC126N2</td>
</tr>
<tr>
<td></td>
<td>MILITARY</td>
<td>16</td>
<td>16 AWG [1.5 mm²] - 20 AWG [0.5 mm²]</td>
<td>M39029/34-273</td>
<td>M39029/35-276</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>20 AWG [0.5 mm²] - 24 AWG [0.25 mm²]</td>
<td>M39029/34-272</td>
<td>M39029/35-275</td>
</tr>
<tr>
<td></td>
<td>COAX</td>
<td>--</td>
<td>RG 178 B/U, RG 196 A/U</td>
<td>M48126N</td>
<td>F48126N2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>RG 179 A/U, RG 316 /U</td>
<td>M48226N</td>
<td>F48226N2</td>
</tr>
<tr>
<td><strong>SOLDER CUP</strong></td>
<td>POWER</td>
<td>16</td>
<td>14 AWG [2.5 mm²] max.</td>
<td>MS114N</td>
<td>FS114N2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
<td>16 AWG [1.5 mm²] max.</td>
<td>MS116N</td>
<td>FS116N2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>16 AWG [1.5 mm²] max.</td>
<td>MS216N</td>
<td>FS216N2</td>
</tr>
<tr>
<td></td>
<td>SIGNAL</td>
<td>16</td>
<td>20 AWG [0.5 mm²] max.</td>
<td>MS120N</td>
<td>FS120N2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>20 AWG [0.5 mm²] max.</td>
<td>MS220N</td>
<td>FS220N2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>24 AWG [0.25 mm²] max.</td>
<td>MS224N</td>
<td>FS224N2</td>
</tr>
</tbody>
</table>

For ordering crimp contacts on reels, add R to part number. Examples: MC114NR or FC114N2R.

## GMCT SERIES PRINTED BOARD MOUNT CONTACT TERMINATIONS

<table>
<thead>
<tr>
<th>TERMINATION TYPE</th>
<th>CONTACT SIZE</th>
<th>USABLE TERMINATION LENGTH</th>
<th>TERMINATION DIMENSION</th>
<th>MALE PART NUMBER</th>
<th>FEMALE PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STRAIGHT</strong></td>
<td>16</td>
<td>0.125 [3.18]</td>
<td>0.026 Ø [0.66]</td>
<td>MDS125N</td>
<td>FDS125N2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.156 [3.96]</td>
<td>0.026 Ø [0.66]</td>
<td>MDS156N</td>
<td>FDS156N2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.187 [4.75]</td>
<td>0.026 Ø [0.66]</td>
<td>MDS187N</td>
<td>FDS187N2</td>
</tr>
<tr>
<td><strong>WRAP POST</strong></td>
<td>16</td>
<td>0.695 [17.65]</td>
<td>0.025 SQUARE [0.64]</td>
<td>MW814N</td>
<td>FW814N2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.695 [17.65]</td>
<td>0.045 SQUARE [1.14]</td>
<td>MW845N</td>
<td>FW845N2</td>
</tr>
<tr>
<td><strong>COMPLIANT PRESS FIT</strong></td>
<td>16</td>
<td>0.218 [5.54]</td>
<td></td>
<td>MPF218N</td>
<td>FPF218N2</td>
</tr>
</tbody>
</table>

Dimensions are in inches [millimeters]. All dimensions are subject to change.
# ORDERING INFORMATION - CODE NUMBERING SYSTEM

Specify Complete Connector By Selecting An Option From Step 1 Through 9

<table>
<thead>
<tr>
<th>STEP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXAMPLE</td>
<td>GMCT 34 F 0 0 R A Z 0 /AA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### GMCT SERIES

#### STEP 1 - BASIC SERIES
GMCT Series

#### STEP 2 - CONNECTOR VARIANTS
9, 14, 18, 20, 26, 34, 41, 42, 50, 60, 66, 75, 104

#### STEP 3 - CONNECTOR GENDER
- M - Male Insulator
- F - Female Insulator

#### STEP 4 - CONTACT TERMINATION TYPE
All Female contacts “closed entry” design.
- 0 - Contacts to be ordered separately, see Contact ordering charts.

#### *STEP 5 - POLARIZING GUIDES AND JACKSCREW SYSTEM*
- G - Polarizing grounding guides.
- N - Polarizing guides.
- NSS - Stainless steel polarizing guides.
- T - Fixed jackscrews.
- E - Short turnable jackscrews, offered with set screw option.
- EL - Long turnable jackscrews, offered with set screw option.
- E1 - Turnable jackscrews used on 9, 14, 18, 20, 26 and 41 variant hoods, offered with set screw option.
- 0 - If no polarizing guides or jackscrews are required. Also, use “0” if ordering hoods equipped with jackscrews, for variants 34, 42, 50, 60, 66, 75 and 104, see STEP 8.

#### *STEP 6 - SHELLS AND MOUNTING PLATES*
- P - Male shell, not available on 41 variant.
- R - Female shell, not available on 41 variant.
- H - Mounting plate, not available on 41 variant.
- W - Male shell with mounting plate.
- U - Female shell with mounting plate.
- 0 - If no shells or mounting plates are required.

#### *STEP 7 - POLARIZATION POSITIONS OF SHELLS*
Select letter to designate position of male pin and female slot for polarization system.
- A, B, C, D, E, F, G
- 0 - If no polarization is required or if no shells are required.

#### *STEP 8 - CABLE ADAPTERS (HOODS)*
- J - Top opening hood (formed), not offered on 60, 66 and 104 variants.
- L - Side opening hood (formed), not offered on 60, 66 and 104 variants.
- Q - Top opening hood (drawn), offered on 60, 66 and 104 variants.
- S - Side opening hood (drawn), offered on 60, 66 and 104 variants.
- Y - Top opening hood (formed), equipped with stainless steel jackscrew system, offered on 34, 42, 50 and 75 variants.
- I - Side opening hood (formed), equipped with stainless steel jackscrew system, offered on 34, 42, 50 and 75 variants.
- Z - Top opening hood (drawn), equipped with stainless steel jackscrew system, offered on 34, 50, 60, 66, 75 and 104 variants.
- V - Side opening hood (drawn), equipped with stainless steel jackscrew system, offered on 34, 50, 60, 66, 75 and 104 variants.
- 0 - If no hoods are required.

#### *NOTE: FOR DETAILS OF ITEMS LISTED IN STEPS 5 THROUGH 9, SEE HEAVY-DUTY RECTANGULAR CONNECTOR ACCESSORIES SECTION ON PAGES 51-66.*

---

### GMCT SERIES

#### Standard Density Rectangular Connectors with Removable Contacts

- **HEAVY-DUTY RECTANGULAR CONNECTORS WITH REMOVABLE CONTACTS**
- **Dimensions are in inches [millimeters].**
- **All dimensions are subject to change.**

- **Positronic Industries**
- connectpositronic.com

---

*NOTE: If compliance to environmental legislation is not required, this step will not be used. Example: GMCT34F00RAZ0*
GAP Series connectors are heavy-duty, multi-pole, low profile, high reliability connectors. Contacts are male only with 0.062 inch [1.57mm] diameters, rated to 7.5 amperes per contact. Termination style is straight solder printed board mount. GAP Series connectors are intermateable with Positronic GMCT Series connectors.

A wide array of mounting, locking and polarizing accessories is available for this series. For details, see the Heavy-Duty Rectangular Connector Accessories section.

Due to its printed board mount termination style, and its 0.062 inch [1.57mm] diameter contacts, the GAP Series is ideal for heavy-duty applications found in avionics, medical equipment, telecommunications, instrumentation and process control applications.

**GAP SERIES TECHNICAL CHARACTERISTICS**

**MILITARY SPECIFICATIONS:**
Conforms to MIL-DTL-28748.

**INTERNATIONAL STANDARDS:**

**MATERIALS AND FINISHES:**
- **Insulator:** Glass filled DAP per ASTM-D-5948 type SDG-F. Grey color is standard, black available.
- **Fixed Contacts:** Copper alloy with gold flash over nickel. Other finishes available upon request.
- **Jackscrew System:** Passivated stainless steel.
- **Polarizing Guides:** Copper alloy with nickel plate or passivated stainless steel.
- **Vibration Locks:** Copper alloy with zinc plate and chrome seal.

**MECHANICAL CHARACTERISTICS:**
- **Fixed Contacts:** Male – Size 16: 0.062 inch [1.57 mm] diameter.
- **Contact Retention in Insulator:** 10 lbs. [44.5N] minimum.
- **Contact Termination:** Straight printed board mounted.
- **Locking Systems:** Friction, vibration locks and jackscrews.
- **Polarization:** Guide pins and guide sockets, and jackscrew system.
- **Mechanical Operations:** 1000 operations per IEC 512-5.
- **Jackscrews:** Standard threads, 6-32 UNC. Metric threads, M3X0.5 available.

**ELECTRICAL CHARACTERISTICS:**
- **Contact Current Rating (maximum):** 7.5 amperes limited at contact termination diameter.
- **Initial Contact Resistance:** 0.003 ohms.
- **Flash over Voltage:** 2500 V.AC [rms].
- **Test Voltage:** 1200 V.AC [rms].
- **Insulation Resistance (minimum):** 5 G ohms.
- **Clearance and Creepage Distance (minimum):** 0.047 inch [1.19 mm].
- **Working Temperature:** -55°C to 125°C.
- **Working Voltage:** 250 V.AC [rms].
HEAVY-DUTY RECTANGULAR PRINTED BOARD CONNECTORS WITH STRAIGHT SOLDER CONTACTS

STRAIGHT SOLDER CONTACTS
MALE ONLY

CONTACT MATERIAL: COPPER ALLOY
CONTACT FINISH: GOLD FLASH OVER NICKEL

Typical Part Number: GAP34MDS6T0000

<table>
<thead>
<tr>
<th>CONTACT CODE</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS3</td>
<td>0.093 [2.36]</td>
</tr>
<tr>
<td>DS4</td>
<td>0.125 [3.18]</td>
</tr>
<tr>
<td>DS5</td>
<td>0.156 [3.96]</td>
</tr>
<tr>
<td>DS6</td>
<td>0.187 [4.79]</td>
</tr>
</tbody>
</table>

SEE GMCT SERIES PRINTED BOARD HOLE PATTERN PAGE FOR CONNECTOR VARIANT CONTACT HOLE POSITIONS

SPECIFY CONTACT CODE IN STEP 4 OF ORDERING INFORMATION FOR DESIRED LENGTH OF CONTACT TERMINATION

GAP SERIES, LOW PROFILE, PRINTED BOARD MOUNT CONNECTOR

GMCT SERIES, HIGH PROFILE, PRINTED BOARD MOUNT CONNECTOR

ON A MALE CONNECTOR, THE FEMALE GUIDE OR JACKSCREW IS LOCATED AT CONTACT POSITION A OR NO. 1

GAP34MDS4T0000

GMCT34M0T0000 WITH MDS125N CONTACTS INSTALLED

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
CONTACT HOLE POSITION DIMENSIONS
AND PRINTED BOARD HOLE PATTERN
MATING FACE OF MALE CONNECTOR

HOLE IDENTIFICATION FOR REFERENCE ONLY
SUGGEST 0.120 [3.05] Ø HOLES IN PRINTED BOARD FOR CONNECTOR MOUNTING HOLES
SUGGEST 0.052 [1.32] Ø HOLES IN PRINTED BOARD FOR GAP SERIES CONNECTOR CONTACT TERMINATIONS

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
## GAP SERIES

### ORDERING INFORMATION - CODE NUMBERING SYSTEM

Specify Complete Connector By Selecting An Option From Step 1 Through 9

<table>
<thead>
<tr>
<th>STEP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXAMPLE</td>
<td>GAP</td>
<td>26</td>
<td>M</td>
<td>DS4</td>
<td>T</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>/AA</td>
<td>-14</td>
</tr>
</tbody>
</table>

### STEP 1 - BASIC SERIES

GAP Series (Male Connector Only).

### STEP 2 - CONNECTOR VARIANTS

9, 14, 18, 20, 21, 26, 34, 41, 50

### STEP 3 - CONNECTOR GENDER

M - Male insulator only

### STEP 4 - CONTACT TERMINATION TYPE

- DS3 - Straight solder 0.093 [2.36]
- DS4 - Straight solder 0.125 [3.18]
- DS5 - Straight solder 0.156 [3.96]
- DS6 - Straight solder 0.187 [4.75]

### *STEP 5 - POLARIZING GUIDES AND JACKSCREW SYSTEM*

- G - Polarizing grounding guides.
- N - Polarizing guides.
- NSS - Stainless steel polarizing guides.
- T - Fixed jackscrews.
- 0 - If no polarizing guides or jackscrews are required.

### *STEP 6 - SHELLS*

- P - Male shell, not available on 41 variant.
- R - Female shell, not available on 41 variant.
- 0 - If no shells or mounting plates are required.

### *STEP 7 - POLARIZATION POSITIONS OF SHELLS*

Select letter to designate position of male pin or female slot for polarization system.

- A, B, C, D, E, F, G
- 0 - If no polarization is required or if no shells are required.

### *STEP 8 - CABLE ADAPTERS (HOODS)*

- 0 - Not offered for GAP series.

### *STEP 9 - ADDITIONAL FEATURES*

- B - For black anodized aluminum parts.
- R - For yellow chromate coating on aluminum parts.
- V - Lock tab, offered on 9, 14, 18, 20, 21, 26, 34 and 41 variants.
- 0 - If no additional options are required.

### *STEP 10 - ENVIRONMENTAL COMPLIANCE OPTIONS*

- /AA - Compliant per EU Directive 2002/95/EC (RoHS)

### *NOTE:*

If compliance to environmental legislation is not required, this step will not be used. Example: GAP26MDS4T0000

### *STEP 11 - SPECIAL OPTIONS*

- -14 – Contacts plated 0.000030 [0.76µ] gold over nickel.
- -50 – Contacts plated 0.000050 [1.27µ] gold over copper.

CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS

**NOTE:** FOR DETAILS OF ITEMS LISTED IN STEPS 5 THROUGH 9, SEE HEAVY-DUTY RECTANGULAR CONNECTOR ACCESSORIES SECTION ON PAGES 51-66.
GAPL Series connectors are heavy-duty, multi-pole, high reliability connectors conforming to MIL-DTL-28748 specifications. Termination style is right angle printed board mount. GAPL Series connectors are intermateable with Positronic GMCT Series connectors.

GAPL Series connectors are offered with a variety of mounting, locking and polarizing accessories. For details, see the Heavy-Duty Rectangular Connector Accessories section. GAPL Series connectors are ideal for high reliability, heavy-duty applications which require a printed board mounted connector. They are widely utilized in navigational systems, robotics, mainframe and peripheral computers, medical equipment, telecommunications, instrumentation and process control applications.

GAPL SERIES TECHNICAL CHARACTERISTICS

**MILITARY SPECIFICATIONS:**
Conforms to MIL-DTL-28748.

**INTERNATIONAL STANDARDS:**
IEC 807-1.
U.L. Recognized.

**MATERIALS AND FINISHES:**
**Insulator:** Glass filled DAP per ASTM-D-5948 type SDG-F. Grey color is standard, black available.
**Fixed Contacts:** Copper alloy with gold over nickel. Other finishes available upon request.
**Jackscrew System:** Passivated stainless steel.
**Polarizing Guides:** Copper alloy with nickel plate or passivated stainless steel.
**Vibration Locks:** Copper alloy with zinc plate and chromate seal.

**MECHANICAL CHARACTERISTICS:**
**Fixed Contacts:**
- **Male** – Size 16: 0.062 inch [1.57 mm] diameter.
- **Female** – “Closed entry” design for highest reliability.
**Contact Retention in Insulator:** 10 lbs. [44.5N] minimum.
**Contact Termination:** Right angle printed board mounted.
**Locking Systems:**
- Friction, vibration locks and jackscrews.
**Polarization:**
- Guide pins and guide sockets, and jackscrew system.
**Mechanical Operations:** 1000 operations per IEC 512-5.
**Jackscrews:**
- Standard threads, 6-32 UNC. Metric threads, M3X0.5 available.

**ELECTRICAL CHARACTERISTICS:**
**Contact Current Rating (maximum):** 7.5 amperes limited at contact termination diameter.
**Initial Contact Resistance:** 0.003 ohms.
**Flash over Voltage:** 2500 V.AC [rms].
**Test Voltage:** 1200 V.AC [rms].
**Insulation Resistance (minimum):** 5 G ohms.
**Clearance and Creepage Distance (minimum):** 0.047 inch [1.19 mm].
**Working Temperature:** -55°C to 125°C.
**Working Voltage:** 250 V.AC [rms].

For RoHS options see page 31.

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
### RIGHT ANGLE PRINTED BOARD MOUNT CONNECTORS

#### MALE CONNECTOR

<table>
<thead>
<tr>
<th>SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>0.290</td>
<td>0.212</td>
<td>0.156</td>
<td>0.856</td>
</tr>
<tr>
<td>14</td>
<td>0.290</td>
<td>0.212</td>
<td>0.156</td>
<td>0.877</td>
</tr>
<tr>
<td>18</td>
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<td>0.856</td>
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<tr>
<td>26</td>
<td>0.290</td>
<td>0.212</td>
<td>0.156</td>
<td>0.877</td>
</tr>
<tr>
<td>34</td>
<td>0.417</td>
<td>0.303</td>
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</tr>
<tr>
<td>41</td>
<td>0.290</td>
<td>0.212</td>
<td>0.156</td>
<td>0.877</td>
</tr>
<tr>
<td>50</td>
<td>0.417</td>
<td>0.303</td>
<td>0.220</td>
<td>0.856</td>
</tr>
</tbody>
</table>

**ADD 0.030 [0.76] TO “B” DIMENSION WHEN MOUNTING BRACKET (LB) AND VIBRATION LOCK TAB (V) ARE USED IN COMBINATION ON CONNECTOR**

(V) TAB NOT AVAILABLE ON SIZE 50

**STANDARD POSITION OF INSULATOR REQUIRES CONTACT “A” TO BE ADJACENT TO THE PRINTED BOARD**

**FOR FACE DIMENSIONS OF INSULATOR VARIANT DESIRED, SEE GM SERIES INSULATOR DIMENSION PAGE**

#### FEMALE CONNECTOR

<table>
<thead>
<tr>
<th>SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>0.290</td>
<td>0.212</td>
<td>0.156</td>
<td>0.856</td>
</tr>
<tr>
<td>14</td>
<td>0.290</td>
<td>0.212</td>
<td>0.156</td>
<td>0.877</td>
</tr>
<tr>
<td>18</td>
<td>0.290</td>
<td>0.212</td>
<td>0.156</td>
<td>0.856</td>
</tr>
<tr>
<td>20</td>
<td>0.290</td>
<td>0.212</td>
<td>0.156</td>
<td>0.856</td>
</tr>
<tr>
<td>26</td>
<td>0.290</td>
<td>0.212</td>
<td>0.156</td>
<td>0.877</td>
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<tr>
<td>34</td>
<td>0.417</td>
<td>0.303</td>
<td>0.220</td>
<td>0.856</td>
</tr>
<tr>
<td>41</td>
<td>0.290</td>
<td>0.212</td>
<td>0.156</td>
<td>0.877</td>
</tr>
<tr>
<td>50</td>
<td>0.417</td>
<td>0.303</td>
<td>0.220</td>
<td>0.856</td>
</tr>
</tbody>
</table>

**ADD 0.030 [0.76] TO “B” DIMENSION WHEN MOUNTING BRACKET (LB) AND VIBRATION LOCK TAB (V) ARE USED IN COMBINATION ON CONNECTOR**

(V) TAB NOT AVAILABLE ON SIZE 50

**STANDARD POSITION OF INSULATOR REQUIRES CONTACT “A” TO BE ADJACENT TO THE PRINTED BOARD**

**FOR FACE DIMENSIONS OF INSULATOR VARIANT DESIRED, SEE GMCT SERIES INSULATOR DIMENSION PAGE**

**CONTACT MATERIAL: COPPER ALLOY**

**CONTACT FINISH: GOLD FLASH OVER NICKEL**

DIMENSIONS ARE IN INCHES [MILLIMETERS].

ALL DIMENSIONS ARE SUBJECT TO CHANGE.
MALE RIGHT ANGLE PRINTED BOARD HOLE PATTERN

SUGGEST 0.109 [2.77] Ø HOLES IN PRINTED BOARD FOR CONNECTOR MOUNTING HOLES FOR VARIANTS 9, 14, 18, 20, 26 AND 41
SUGGEST 0.125 [3.18] Ø HOLES IN PRINTED BOARD FOR CONNECTOR MOUNTING HOLES FOR VARIANTS 34 AND 50
SUGGEST 0.052 [1.32] Ø HOLES IN PRINTED BOARD FOR CONTACT TERMINATIONS

ADD 0.030 [0.76] TO THE MOUNTING HOLE POSITION WHEN MOUNTING BRACKET (LB) AND VIBRATION LOCK TAB (V) ARE USED IN COMBINATION ON CONNECTOR
FEMALE RIGHT ANGLE PRINTED BOARD HOLE PATTERN

SUGGEST 0.109 [2.77] Ø HOLES IN PRINTED BOARD FOR CONNECTOR MOUNTING HOLES FOR VARIANTS 9, 14, 18, 20, 26 AND 41

SUGGEST 0.125 [3.18] Ø HOLES IN PRINTED BOARD FOR CONNECTOR MOUNTING HOLES FOR VARIANTS 34 AND 50

SUGGEST 0.052 [1.32] Ø HOLES IN PRINTED BOARD FOR CONTACT TERMINATIONS

ADD 0.030 [0.76] TO THE MOUNTING HOLE POSITION WHEN MOUNTING BRACKET (LB) AND VIBRATION LOCK TAB (V) ARE USED IN COMBINATION ON CONNECTOR

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
HEAVY-DUTY RECTANGULAR RIGHT ANGLE PRINTED BOARD CONNECTORS

MOUNTING BRACKET (LB)

<table>
<thead>
<tr>
<th>SIZE</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>0.188 [4.78]</td>
<td>0.299 [7.59]</td>
</tr>
<tr>
<td>14</td>
<td>0.219 [5.56]</td>
<td>0.330 [8.38]</td>
</tr>
<tr>
<td>18</td>
<td>0.284 [7.21]</td>
<td>0.395 [10.03]</td>
</tr>
<tr>
<td>20</td>
<td>0.219 [5.56]</td>
<td>0.330 [8.38]</td>
</tr>
<tr>
<td>26</td>
<td>0.284 [7.21]</td>
<td>0.395 [10.03]</td>
</tr>
<tr>
<td>41</td>
<td>0.219 [5.56]</td>
<td>0.330 [8.38]</td>
</tr>
</tbody>
</table>

USE ON CONNECTOR VARIANTS 9, 14, 18, 20, 26 AND 41
MATERIAL: COPPER ALLOY
FINISH: ZINC PLATE WITH CHROMATE SEAL

USE ON CONNECTOR VARIANTS 34 AND 50
MATERIAL: COPPER ALLOY
FINISH: ZINC PLATE WITH CHROMATE SEAL

PUSH-ON FASTENER FOR RIVETED ON RIGHT ANGLE MOUNTING BRACKETS (LN, LN2)

<table>
<thead>
<tr>
<th>SAMPLE #</th>
<th>PRINTED BRD. HOLE Ø</th>
<th>INSERTION FORCE (lbs.)</th>
<th>RETENTION FORCE (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.120 [3.05]</td>
<td>7 1/4</td>
<td>5 3/4</td>
</tr>
<tr>
<td>2</td>
<td>0.123 [3.12]</td>
<td>5 3/4</td>
<td>5 1/2</td>
</tr>
<tr>
<td>3</td>
<td>0.125 [3.18]</td>
<td>2 3/4</td>
<td>2 1/2</td>
</tr>
<tr>
<td>4</td>
<td>0.128 [3.25]</td>
<td>1 3/4</td>
<td>2 1/4</td>
</tr>
<tr>
<td>5</td>
<td>0.126 [3.20] PLATED</td>
<td>1 3/4</td>
<td>2 1/4</td>
</tr>
</tbody>
</table>

MATERIAL: COPPER ALLOY, TIN PLATE
SUGGEST 0.123 ±0.003 [3.12] Ø HOLE FOR MOUNTING CONNECTOR WITH PUSH-ON FASTENER
### Ordering Information - Code Numbering System

Specify Complete Connector by Selecting an Option from Step 1 Through 7

**Step 1 - Basic Series**

GAPL Series.

**Step 2 - Connector Variants**

9, 14, 18, 20, 26, 34, 41, 50

**Step 3 - Connector Gender**

M - Male Insulator
F - Female Insulator

**Step 4 - Contact Termination Type**

0 - Standard termination.

**Step 5 - Polarizing Guides and Jackscrew System**

G - Polarizing grounding guides.
N - Polarizing guides.
NSS - Stainless steel polarizing guides.
T - Fixed jackscrews.
0 - If no polarizing guides or jackscrews are required.

**Step 6 - Locking Devices**

V - Lock tab.
VL - Lock lever.
0 - If no locking devices are required.

**Step 7 - Mounting Bracket**

LB - Mounting bracket.
LN - Mounting bracket with push-on fastener, offered on size 34 and 50 only.
LN2 - Mounting bracket with push-on fastener, offered on size 34 and 50 only.
0 - If no mounting bracket is required.

**Step 8 - Environmental Compliance Options**

/AA - Compliant per EU Directive 2002/95/EC (RoHS)

**Step 9 - Special Options**

-14 – Contacts plated 0.000030 [0.76µ] gold over nickel.
-50 – Contacts plated 0.000050 [1.27µ] gold over copper.

*Note: If compliance to environmental legislation is not required, this step will not be used. Example: GAPL14M0NVLB

*Note: For details of items listed in Steps 5 through 7, see Heavy-Duty Rectangular Connector Accessories Section on Pages 51-66.
VMCT and VAPL series connectors are high reliability connectors meeting international standards for CCITT V.35 interfacing. To meet these specifications, VMCT and VAPL series connectors come in 34 position glass filled DAP insulators with 0.062 inch [1.57mm] diameters, size 16 contacts rated to 13 amperes.

VMCT Series connectors are offered in crimp, solder cup, printed board mount, press-fit and wrap post terminations. VAPL Series connectors have right angle printed board mount terminations. VMCT and VAPL series connectors meet performance requirements for MIL-DTL-28748 and SAE AS 39029.

A wide array of mounting, locking, shrouding and polarizing accessories is available for these connectors. For details, see the Heavy-Duty Rectangular Connector Accessories section, GMCT 34 variant.

VMCT and VAPL series connectors were specifically designed to satisfy requirements for V.35 interfacing and high speed data transmission found in the telecommunications, modem and computer industries. These connectors fully comply with the contact and jackscrew system requirements of ISO standard 2593, as revised by ISO TC 97/SC6 N 2599 and 3236.

**V.35 SERIES TECHNICAL CHARACTERISTICS**

**VMCT SERIES CONNECTORS WITH REMOVABLE CONTACTS**

**MILITARY SPECIFICATIONS:**
Qualified to MIL-DTL-28748/3 and MIL-DTL-28748/4. Contacts qualified to SAE AS 39029/34 and SAE AS 39029/35.

**INTERNATIONAL STANDARDS:**
IEC 807-1 and IEC 807-7.
U.L. Recognized.

**MATERIALS AND FINISHES:**
- **Insulator:** Glass filled DAP per ASTM-D-5948 type SDG-F. Grey color is standard, black available.
- **Removable Contacts:** Copper alloy with gold flash over nickel. Military contacts plated 0.000050 inch [1.27 microns] gold over copper. Other finishes available upon request.
- **Hoods, Cable Adapters:** Aluminum with yellow or black anodize. Steel with zinc plate and chromate seal.
- **Shells:** Aluminum with yellow or black anodize.
- **Jackscrew System:** Passivated stainless steel.
- **Polarizing Guides:** Copper alloy with nickel plate or passivated stainless steel.
- **Vibration Locks:** Copper alloy with zinc plate and chromate seal.

**MECHANICAL CHARACTERISTICS:**
- **Removable Contacts:** Insert contact to rear face of insulator, release from front face of insulator. Size 16 [13 amps.] contacts available. Female contact has “closed entry” design for highest reliability.
- **Contact Retention in Insulator:** 20 lbs. [89N] after 10 cycles of contact insertion extraction.

**ELECTRICAL CHARACTERISTICS:**
- **Contact Current Rating:** Size 16: 0.062 inch [1.57 mm] diameter – 13 amps nominal.
- **Initial Contact Resistance:** Size 16 – 0.003 ohms.
- **Flash over Voltage:** 2700 V.AC [rms].
- **Test Voltage:** Size 16 – 2000 V.AC [rms].
- **Insulation Resistance (minimum):** 5 G ohms.
- **Clearance and Creepage Distance (minimum):** 0.080 inch [2.03 mm].
- **Working Temperature:** -55°C to 125°C.
- **Working Voltage:** 250 V.AC [rms].

**Contact Termination:** Crimp all wire sizes from 14 AWG [2.5 mm²] through 32 AWG [0.03 mm²]. Solder cup, wrap post, press-fit and printed board mount.

**Locking Systems:** Friction, vibration locks and jackscrews.

**Polarization:** Polarized guides, polarized shells and jackscrew system.

**Mechanical Operations:** 1000 operations per IEC 512-5.

**Jackscrews:** Standard threads, 6-32 UNC. Metric threads, M3X0.5 available.

For RoHS options see page 36.
VAPL SERIES TECHNICAL CHARACTERISTICS

MILITARY SPECIFICATIONS:
Conforms to MIL-DTL-28748.

INTERNATIONAL STANDARDS:
IEC 807-1 and IEC 807-7.
U.L. Recognized.

MATERIALS AND FINISHES:
Insulator: Glass filled DAP per ASTM-D-5948 type SDG-F. Grey color is standard, black available.
Fixed Contacts: Copper alloy, gold flash over nickel.
Polarizing Guides: Copper alloy with nickel plate or passivated stainless steel.
Vibration Locks: Copper alloy with zinc plate and chromate seal.

MECHANICAL CHARACTERISTICS:
Fixed Contacts:
Male – Size 16: 0.062 inch [1.57 mm] diameter.
Female – “Closed entry” design for highest reliability.
Contact Retention in Insulator: 10 lbs. [44.5N] minimum.
Contact Termination:
Right angle printed board mounted.
Locking Systems:
Friction, vibration locks and jackscrews.
Polarization:
Polarized guides and jackscrew system.
Mechanical Operations:
1000 operations per IEC 512-5.
Jack screws:
Standard threads, 6-32 UNC. Metric threads, M3X0.5 available.

ELECTRICAL CHARACTERISTICS:
Contact Current Rating: 7.5 amps. limited at contact termination diameter.
Initial Contact Resistance: 0.003 ohms.
Flash over Voltage: 2500 V.AC [rms].
Test Voltage: 1200 V.AC [rms].
Insulation Resistance (minimum): 5 G ohms.
Clearance and Creepage Distance (minimum): 0.047 inch [1.19 mm].
Working Temperature: -55°C to 125°C.
Working Voltage: 250 V.AC [rms].

VMCT/VA PL SERIES TYPICAL CONNECTOR MATING ASSEMBLY

SEE PAGE 64 FOR EMI/RFI SHIELDED HOOD ASSEMBLY.

VMCT34M00R0Y0-MOS*
DTE CONNECTOR

VAPL34F0TPLB-MOS*
DCE CONNECTOR

* MOS DESIGNATES THE NUMBERING SYSTEM FOR SPECIAL CUSTOMER REQUIREMENTS. SELECTIVE LOADING OF CONTACTS FOR V.35 CONNECTORS IS ACHIEVED THROUGH THIS SYSTEM. PLEASE CONTACT TECHNICAL SALES FOR DETAILS.
VMCT SERIES CONNECTOR INSULATOR DIMENSIONS

**FEMALE CONNECTOR**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>0.750 [19.05]</td>
</tr>
<tr>
<td>Width</td>
<td>0.375 [9.53]</td>
</tr>
<tr>
<td>Depth</td>
<td>0.234 [5.94]</td>
</tr>
<tr>
<td>Overall Width</td>
<td>1.688 [42.88]</td>
</tr>
<tr>
<td>Overall Height</td>
<td>0.856 [21.74]</td>
</tr>
</tbody>
</table>

**MALE CONNECTOR**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>0.750 [19.05]</td>
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<tr>
<td>Width</td>
<td>0.375 [9.53]</td>
</tr>
<tr>
<td>Depth</td>
<td>0.234 [5.94]</td>
</tr>
<tr>
<td>Overall Width</td>
<td>1.688 [42.88]</td>
</tr>
<tr>
<td>Overall Height</td>
<td>0.856 [21.74]</td>
</tr>
</tbody>
</table>

FOR VMCT [V.35] SERIES CONTACTS, SEE GMCT SERIES CONTACT SECTION

MATERIAL: GLASS FILLED DIALYL PHTHALATE
PER ASTM-D-5948 TYPE SDG-F

VAPL SERIES RIGHT ANGLE PRINTED BOARD MOUNT CONNECTORS

**FEMALE CONNECTOR**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Height</td>
<td>0.075 [1.91]</td>
</tr>
<tr>
<td>Width</td>
<td>0.034 [0.86]</td>
</tr>
<tr>
<td>Overall Width</td>
<td>1.200 [30.48]</td>
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</table>

**MALE CONNECTOR**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
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<tbody>
<tr>
<td>Height</td>
<td>0.075 [1.91]</td>
</tr>
<tr>
<td>Width</td>
<td>0.034 [0.86]</td>
</tr>
<tr>
<td>Overall Width</td>
<td>1.200 [30.48]</td>
</tr>
</tbody>
</table>

ON A MALE CONNECTOR, THE FEMALE JACKSCREW IS LOCATED AT CONTACT POSITION A

VAPL SERIES RIGHT ANGLE PRINTED BOARD HOLE PATTERN

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
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<tbody>
<tr>
<td>Height</td>
<td>0.303 [7.70]</td>
</tr>
<tr>
<td>Diameter</td>
<td>0.037 [0.94]</td>
</tr>
</tbody>
</table>

FOR MOUNTING BRACKET DIMENSIONS SEE GAPL SERIES, GAPL 34 VARIANT, PAGE 30

SUGGEST 0.052 [1.32] Ø HOLES IN PRINTED BOARD FOR CONTACT TERMINATIONS
SUGGEST 0.125 [3.18] Ø HOLES IN PRINTED BOARD FOR CONNECTOR MOUNTING HOLES

DIMENSIONS ARE IN INCHES (MILLIMETERS), ALL DIMENSIONS ARE SUBJECT TO CHANGE.
HEAVY-DUTY RECTANGULAR
CCITT V.35
INTERFACE CONNECTORS

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.

VMCT34M00P0Y0
with MC120N contacts

VAPL34F0T0LB - XXX.X

VMCT34F00P0I0

VAPL34M0T0LB

VAPL34M0T0LB

VMCT34F0T0000-607.0

GAP34MDSST0000

VAPL34F0T0LB

VMCT34M0000Y0 with
MC120N contacts installed
### ORDERING INFORMATION - CODE NUMBERING SYSTEM

Specify Complete Connector By Selecting An Option From Step 1 Through 9

#### VMCT SERIES

<table>
<thead>
<tr>
<th>STEP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXAMPLE</td>
<td>VMCT</td>
<td>34</td>
<td>F</td>
<td>0</td>
<td>0</td>
<td>R</td>
<td>B</td>
<td>Z</td>
<td>0</td>
<td>/AA</td>
<td></td>
</tr>
</tbody>
</table>

- **STEP 1 - BASIC SERIES**
  VMCT Series (V.35).

- **STEP 2 - CONNECTOR VARIANTS**
  34

- **STEP 3 - CONNECTOR GENDER**
  - M - Male Insulator
  - F - Female Insulator

- **STEP 4 - CONTACT TERMINATION TYPE**
  All Female contacts “closed entry” design.
  - 0 - Contacts to be ordered separately, see contact ordering charts.

- **STEP 5 - POLARIZING GUIDES AND JACKSCREW SYSTEM**
  - G - Polarizing grounding guides.
  - N - Polarizing guides.
  - NSS - Stainless steel polarizing guides.
  - T - Fixed jackscrews.
  - E - Short turnable jackscrews, offered with set screw option.
  - EL - Long turnable jackscrews, offered with set screw option.
  - 0 - If no polarizing guides or jackscrews are required. Also, use “0” if ordering hoods equipped with jackscrews, see STEP 8.

- **STEP 6 - SHELLS AND MOUNTING PLATES**
  - P - Male shell.
  - R - Female shell.
  - H - Mounting plate.
  - W - Male shell with mounting plate.
  - U - Female shell with mounting plate.
  - 0 - If no shells or mounting plates are required.

- **STEP 7 - POLARIZATION POSITIONS OF SHELLS**
  Select letter to designate position of male pin and female slot for polarization system.
  - A, B, C, D, E, F, G
  - 0 - If no polarization is required or if no shells are required.

- **STEP 8 - CABLE ADAPTERS (HOODS)**
  - J - Top opening hood (formed).
  - L - Side opening hood (formed).
  - Y - Top opening hood (formed), equipped with stainless steel jackscREW system.
  - I - Side opening hood (formed), equipped with stainless steel jackscREW system.
  - Z - Top opening hood (drawn, side access), equipped with stainless steel jackscREW system.
  - V - Side opening hood (drawn, side access), equipped with stainless steel jackscREW system.
  - 0 - If no hoods are required.

- **STEP 9 - ADDITIONAL FEATURES**
  - B - For black anodized aluminum parts.
  - C - Set screw option, offered on the E and EL jackscREW systems.
  - R - For yellow chromate coating on alu-minum parts.
  - V - Lock tab.
  - VL - Lock lever.
  - FB - Floating bushings for mounting plate.
  - 0 - If no additional options are required.

- **STEP 10 - ENVIRONMENTAL COMPLIANCE OPTIONS**
  - /AA - Compliant per EU Directive 2002/95/EC (RoHS)

- **STEP 11 - SPECIAL OPTIONS**
  CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS

**NOTE:** If compliance to environmental legislation is not required, this step will not be used. Example: VMCT34F00RBZ0

*NOTE:* For details of items listed in steps 5 through 9, see heavy-duty rectangular connector accessories section, GMCT 34 variant, pages 51-66.
### Ordering Information - Code Numbering System

Specify Complete Connector by selecting an option from Step 1 through 7.

#### VAPL Series

<table>
<thead>
<tr>
<th>STEP</th>
<th>EXAMPLE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Basic Series</strong></td>
<td>VAPL</td>
<td>34</td>
<td>F</td>
<td>0</td>
<td>T</td>
<td>0</td>
<td>LB</td>
<td>/AA</td>
<td>-14</td>
<td></td>
</tr>
<tr>
<td>2. <strong>Connector Variants</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. <strong>Connector Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. <strong>Contact Termination Type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. <strong>Polarizing Guides and Jackscrew System</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. <strong>Locking Devices</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7. <strong>Mounting Bracket</strong></td>
<td></td>
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</tr>
<tr>
<td>8. <strong>Environmental Compliance Options</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Special Options

-14 – Contacts plated 0.000030 [0.76µ] gold over nickel.

-50 – Contacts plated 0.000050 [1.27µ] gold over copper.

**Contact Technical Sales for Special Options**

#### Environmental Compliance Options

/AA - Compliant per EU Directive 2002/95/EC (RoHS)

**Note:** If compliance to environmental legislation is not required, this step will not be used. Example: VAPL34F0T0LB

#### Mounting Bracket

- LB - Mounting bracket.
- LN - Mounting bracket with push-on fastener.
- LN2 - Mounting bracket with one-piece bracket and push-on fastener.
- 0 - If no mounting bracket is required.

**Note:** *Note: For details of items listed in steps 5 through 7, see heavy-duty rectangular connector accessories section, GMCT 34 variant on pages 51-66.

*For mounting bracket dimensions, see GAPL series, GAPL 34 variant*
BAP Series connectors are 34 contact Printed Board Mount Connectors, having contacts with straight solder terminations. BAP connectors are available in male or female contact genders.

The VMCT, VAPL, BAP, and BAPL Series connectors are fully compatible to each series mechanically and electrically in all respects and are in complete compliance to ISO TC97/SC6 and ISO/IEC 2110 PDAD1 requirements. Underwriter Laboratories recognized. Contacts are precision machined of copper alloy and plated gold over nickel. Female contacts feature the high reliability design of the Large Surface Area Contact Mating System.

### BAP SERIES TECHNICAL CHARACTERISTICS

**INTERNATIONAL STANDARDS:**

**MATERIALS AND FINISHES:**
- Insulator: Glass-filled polyester.
- Fixed Contacts: Machined copper alloy, gold flash over nickel. Other finishes available upon request.
- Polarized Jackscrew System: Passivated stainless steel.

**MECHANICAL CHARACTERISTICS:**
- Fixed Contacts: Male - Size 16: 0.062 inch [1.57 mm] diameter. Female: “Rugged ‘Robi-D’ Open Entry” design. Contacts may be selectively loaded in designated positions containing from 14 to 22 contacts per ISO TC97/SC6 or other customer suggested configurations.
- Contact Retention in Insulator: 10 lbs. [44.5N] minimum.
- Contact Termination: Solder, straight P.C. mount. 0.034 inch [0.86 mm] diameter printed board mount style contact.
- Locking Systems: Polarized fixed jackscrews, standard threads, 6-32 UNC and M3X0.5 metric.
- Mechanical Operations: 250 operations per IEC 512-5.

**ELECTRICAL CHARACTERISTICS:**
- Contact Current Rating: 7.5 amps, nominal. limited at contact termination diameter.
- Initial Contact Resistance: 0.005 ohms.
- Flash over Voltage: 2500 V.A.C [rms].
- Test Voltage: 1200 V.A.C [rms].
- Insulation Resistance (minimum): 5 G ohms.
- Clearance and Creepage Distance (minimum): 0.047 inch [1.19 mm].
- Working Temperature: -55°C to 125°C.
- Working Voltage: 250 V.A.C [rms].

For RoHS options see page 40.
### RECTANGULAR CONNECTORS WITH FIXED SOLDER CONTACTS

**STRAIGHT PRINTED BOARD MOUNT SOLDER CONNECTORS**

**MALE CONNECTOR**

**ORDER BY PART NUMBER:**
- BAP34MDS3T0000
- BAP34MDS4T0000
- BAP34MDS5T0000

**PRINTED BOARD HOLE PATTERN**

<table>
<thead>
<tr>
<th>CONTACT CODE</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS3</td>
<td>0.093 [2.36]</td>
</tr>
<tr>
<td>DS4</td>
<td>0.125 [3.18]</td>
</tr>
<tr>
<td>DS5</td>
<td>0.156 [3.96]</td>
</tr>
</tbody>
</table>

Suggest Ø 0.052 [1.32] holes in printed board for BAP-series connector contact terminations.
Suggest Ø 0.120 [3.05] holes in printed board for connector mounting holes.

**FEMALE CONNECTOR**

**ORDER BY PART NUMBER:**
- BAP34FDS3T0000
- BAP34FDS4T0000
- BAP34FDS5T0000

**PRINTED BOARD HOLE PATTERN**

<table>
<thead>
<tr>
<th>CONTACT CODE</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS3</td>
<td>0.093 [2.36]</td>
</tr>
<tr>
<td>DS4</td>
<td>0.125 [3.18]</td>
</tr>
<tr>
<td>DS5</td>
<td>0.156 [3.96]</td>
</tr>
</tbody>
</table>

Suggest Ø 0.052 [1.32] holes in printed board for BAP-series connector contact terminations.
Suggest Ø 0.120 [3.05] holes in printed board for connector mounting holes.

**NOTE:** Contact positions may be selectively loaded in designated positions containing from 14 to 22 contacts.
### Ordering Information - Code Numbering System

Specify Complete Connector By Selecting An Option From Step 1 Through 9

<table>
<thead>
<tr>
<th>STEP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXAMPLE</td>
<td>BAP</td>
<td>34</td>
<td>M</td>
<td>DS4</td>
<td>T</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>/AA</td>
<td>-14</td>
</tr>
</tbody>
</table>

**Step 1 - Basic Series**
BAP Series

**Step 2 - Connector Variants**
34

**Step 3 - Connector Gender**
M - Male insulator
F - Female insulator

**Step 4 - Contact Termination Type**
- DS3 - Straight solder 0.093 [2.36] inches
- DS4 - Straight solder 0.125 [3.18] inches
- DS5 - Straight solder 0.156 [3.96] inches

**Step 5 - Polarizing Guides and Jackscrew System**
- G - Polarizing grounding guides.
- N - Polarizing guides.
- NSS - Stainless steel polarizing guides.
- T - Fixed jackscrews.
- 0 - If no polarizing guides or jackscrews are required.

**Step 6 - Shells**
- P - Male shell.
- R - Female shell.
- 0 - If no shells or mounting plates are required.

**Step 7 - Polarization Positions of Shells**
Select letter to designate position of male pin or female slot for polarization system.
- A, B, C, D, E, F, G
- 0 - If no polarization is required or if no shells are required.

**Step 8 - Cable Adapters (Hoods)**
- 0 - Not offered for BAP series.

**Step 9 - Additional Features**
- B - For black anodized aluminum parts.
- R - For yellow chromate coating on aluminum parts.
- V - Lock tab.
- 0 - If no additional options are required.

**Step 10 - Environmental Compliance Options**
- /AA - Compliant per EU Directive 2002/95/EC (RoHS)

**Note:** If compliance to environmental legislation is not required, this step will not be used. Example: BAP34MDS4T0000

**Step 11 - Special Options**
- -14 – Contacts plated 0.000030 [0.76µ] gold over nickel.
- -50 – Contacts plated 0.000050 [1.27µ] gold over copper.

**Contact Technical Sales for Special Options**

*NOTE: For details of items listed in steps 5 through 9, see Heavy-Duty Rectangular Connector Accessories Section on pages 51-66.*

Dimensions are in inches [millimeters]. All dimensions are subject to change.
BAPL Series connectors are 34 contact Printed Board Mount Connectors, having contacts with 90° angled solder terminations. BAPL connectors are available in male or female contact genders. The VMCT, VAPL, BAP, and BAPL Series connectors are fully compatible to each series mechanically and electrically in all respects. Underwriter Laboratories recognized. Contacts are precision machined of copper alloy and plated gold over nickel. Female contacts feature the high reliability design of the Large Surface Area Contact Mating System.

**BAPL SERIES TECHNICAL CHARACTERISTICS**

**INTERNATIONAL STANDARDS:**
IEC 807-6

**MATERIALS AND FINISHES:**
- Insulator: Glass-filled polyester.
- Fixed Contacts: Machined copper alloy, gold flash over nickel. Other finishes available upon request.
- Polarized Jackscrew System: Passivated stainless steel.

**MECHANICAL CHARACTERISTICS:**
- Male - Size 16: 0.062 inch [1.57 mm] diameter. Female: “Rugged ‘Robi-D’ Open Entry” design. Contacts may be selectively loaded in designated positions containing from 14 to 22 contacts per ISO TC97/SC6 or other customer suggested configurations.
- Contact Retention in Insulator: 10 lbs. [44.5N] minimum.
- Contact Termination: Solder, right angle P.C. mount 0.035 inch [0.89mm] diameter printed board mount style contact.
- Locking Systems: Polarized fixed jackscrews, standard threads, 6-32 UNC and M3X0.5 metric.
- Mechanical Operations: 250 operations per IEC 512-5.

**ELECTRICAL CHARACTERISTICS:**
- Contact Current Rating: 7.5 amps, nominal. limited at contact termination diameter.
- Initial Contact Resistance: 0.005 ohms.
- Flash over Voltage: 2500 V.AC [rms].
- Test Voltage: 1200 V.AC [rms].
- Insulation Resistance (minimum): 5 G ohms.
- Clearance and Creepage Distance (minimum): 0.047 inch [1.19 mm].
- Working Temperature: -55°C to 125°C.
- Working Voltage: 250 V.AC [rms].

For RoHS options see page 44.
Right Angle Printed Board Mount Solder Connectors

Female Connector

Printed Board Hole Pattern

Female Connector

Order by Part Number:
BAPL34F0TLB
BAPL34F0TLN
BAPL34F0TLN2

NOTE: Contact positions may be selectively loaded in designated positions containing from 14 to 22 contacts.

Dimensions are in inches [millimeters]. All dimensions are subject to change.
**RIGHT ANGLE PRINTED BOARD MOUNT SOLDER CONNECTORS**

**MALE CONNECTORS**

ORDER BY PART NUMBER:
- BAPL34M0T0LB
- BAPL34M0T0LN
- BAPL34M0T0LN2

**PRINTED BOARD HOLE PATTERNS**

NOTE: Contact positions may be selectively loaded in designated positions containing from 14 to 22 contacts.

Suggest Ø 0.052 [1.32] holes in printed board for BAPL-series connector contact terminations.

Suggest Ø 0.123 ±0.003 [3.12 ±0.08] holes in printed board for connector mounting holes.

---

**90° MOUNTING BRACKETS AND PUSH-ON FASTENERS (LB, LN, LN2)**

**ANGLE BRACKET (LB)**

Material: Copper alloy, tin plate.

* A push-on fastener mounting option, similar to the LN2 option at right, is also available for the standard BAPL connector. Contact Technical Sales for ordering information.

**ANGLE BRACKET (LN)**

**ANGLE BRACKET (LN2)**

Material: Copper alloy, tin plate.
# Rectangular Connectors with Fixed Solder Contacts

## Ordering Information - Code Numbering System

Specify Complete Connector by Selecting an Option from Step 1 Through 7

<table>
<thead>
<tr>
<th>STEP</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BAPL</td>
</tr>
<tr>
<td>2</td>
<td>34</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>T</td>
</tr>
<tr>
<td>6</td>
<td>O</td>
</tr>
<tr>
<td>7</td>
<td>LB</td>
</tr>
<tr>
<td>8</td>
<td>/AA</td>
</tr>
<tr>
<td>9</td>
<td>-14</td>
</tr>
</tbody>
</table>

### Step 1 - Basic Series
BAPL Series.

### Step 2 - Connector Variants
34

### Step 3 - Connector Gender

- M - Male Insulator
- F - Female Insulator

### Step 4 - Contact Termination Type
0 - Standard termination.

### Step 5 - Polarizing Guides and Jackscrew System

- G - Polarizing grounding guides.
- N - Polarizing guides.
- NSS - Stainless steel polarizing guides.
- T - Fixed jackscrews.
- 0 - If no polarizing guides or jackscrews are required.

### Step 6 - Locking Devices

- V - Lock tab.
- VL - Lock lever.
- 0 - If no locking devices are required.

### Step 7 - Mounting Bracket

- LB - Mounting bracket.
- LN - Mounting bracket with push-on fastener.
- LN2 - Mounting bracket with push-on fastener.
- 0 - If no mounting bracket is required.

### Step 8 - Environmental Compliance Options

/AA - Compliant per EU Directive 2002/95/EC (RoHS)

### Step 9 - Special Options

- -14 - Contacts plated 0.000030 [0.76µ] gold over nickel.
- -50 - Contacts plated 0.000050 [1.27µ] gold over copper.
- -997.0 - Allows for 0.150 [3.81] spacing between rows, and to be inverted. Supplied without alignment bar. Female only.
- -1439.0 - Allows for inverted contacts. Supplied with special length contacts and alignment bar. Female only.

**NOTE:** If compliance to environmental legislation is not required, this step will not be used. Example: BAPL34FOTOLB

**For Mounting Bracket Dimensions, See GAPL Series, GAPL 34 Variant**

---

Dimensions are in inches [millimeters].
All dimensions are subject to change.

---

[For more details, see Heavy-Duty Rectangular Connector Accessories Section on Pages 51-66.]
GM SERIES

GM Series connectors are multi-pole, high reliability connectors qualified to MIL-DTL-28748 specifications. Contacts are 0.040 inch [1.02mm] diameters, rated to 7.5 amperes per contact. Termination styles are solder cup and straight solder printed board mount. Eleven connector variants, seven through 50 poles, are offered.

A wide array of mounting, locking, shrouding and polarizing accessories is available for this series. For details, see the Heavy-Duty Rectangular Connector Accessories section.

The GM Series is a popular choice of engineers in all areas of electronics and is widely utilized in navigational systems, robotics, mainframe and peripheral computers, medical equipment, telecommunications, instrumentation and process control applications.

GM Series connectors may not be mateable with GMCT Series connectors and contacts, contact Technical Sales.

GM SERIES TECHNICAL CHARACTERISTICS

MILITARY SPECIFICATIONS:
Qualified to MIL-DTL-28748/5 and MIL-DTL-28748/6.

INTERNATIONAL STANDARDS:
IEC 807-6.
U.L. Recognized.

MATERIALS AND FINISHES:

Insulator: Glass filled DAP per ASTM-D-5948 type SDG-F. Grey color is standard, black available.

Fixed Contacts: Solder - Copper alloy, gold flash over nickel. Printed Board Mounted - Copper alloy, gold flash over nickel. Military - Copper alloy, 0.000050 inch [1.27 microns] gold over nickel. Other finishes available upon request.

Hoods, Cable Adapters: Aluminum with yellow or black anodize.
Shells: Aluminum with yellow or black anodize.

Jack screws: Standard threads, 6-32 UNC. Metric threads, M3X0.5 available.

Jackscrews: Standard threads, 6-32 UNC. Metric threads, M3X0.5 available.

Polarizing Guides: Copper alloy with nickel plate or passivated stainless steel.

Vibration Locks: Copper alloy with zinc plate and chromate seal.

MECHANICAL CHARACTERISTICS:

Fixed Contacts: Male - Size 20: 0.040 inch [1.02 mm²] diameter. Female - Open entry is standard. “Closed entry” available on solder cup style for high reliability applications.

Contact Retention in Insulator: 10 lbs. [44.5N] minimum.

Contact Termination: 0.046 inch [1.17 mm] internal diameter on solder cup style contact for 20 AWG [0.5 mm²] wire maximum. 0.025 inch [0.64 mm] diameter printed board mount style contact.

Locking Systems: Friction, vibration locks and jackscrews.

Polarization: Polarized guides, polarized shells and jackscrew system.

Mechanical Operations: With “closed entry” female contacts, 500 operations per IEC 512-5.

ELECTRICAL CHARACTERISTICS:

Contact Current Rating (maximum): 7.5 amps.
Initial Contact Resistance: 0.010 ohms.
Flash over Voltage: 2500 V.AC [rms].
Test Voltage: 1200 V.AC [rms].

Insulation Resistance (minimum): 5 G ohms.

Clearance and Creepage Distance (minimum): 0.047 inch [1.19 mm].
Working Temperature: -55°C to 125°C.
Working Voltage: 300 V.AC [rms].
SOLDER CUP CONTACTS

CONTACT MATERIAL: COPPER ALLOY
CONTACT FINISH: GOLD FLASH OVER NICKEL
“CLOSED ENTRY” FEMALE CONTACT AVAILABLE
SPECIFY CODE “CE” IN STEP 10 OF ORDERING INFORMATION

ON A MALE CONNECTOR, THE FEMALE GUIDE OR JACKSCREW IS LOCATED AT CONTACT POSITION A

 Typical Part Number: GM14FSCN0000
 Typical Part Number: GM14MSCN0000

STRAIGHT SOLDER CONTACTS FOR PRINTED BOARD MOUNT

CONTACT MATERIAL: COPPER ALLOY
CONTACT FINISH: GOLD FLASH OVER NICKEL

NYLON WASHER TYP.

Typical Part Number: GM34FDS5T0000

CONTACT CODE | L
---|---
DS3 | 0.093 [2.36]
DS4 | 0.125 [3.18]
DS5 | 0.156 [3.96]
DS6 | 0.187 [4.75]

SPECIFY CONTACT CODE IN STEP 4 OF ORDERING INFORMATION FOR DESIRED LENGTH OF CONTACT TERMINATION

SEE GM SERIES PRINTED BOARD HOLE PATTERN PAGE FOR CONNECTOR VARIANT CONTACT HOLE POSITIONS

TYPICAL MATING ASSEMBLY

GM9FSCT0000
GM9MSCE0000

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
INSULATOR DIMENSIONS

MATING FACE OF FEMALE CONNECTOR OR REAR FACE OF MALE CONNECTOR

GM SERIES

GM7

GM8

GM9

GM10

GM11

GM12

GM13

GM14

GM15

GM16

GM17

GM18

GM19

GM20

GM21

GM22

GM23

GM24

GM25

GM26

GM27

GM28

GM29

GM30

GM31

GM32

GM33

GM34

GM35

GM36

GM37

GM38

GM39

GM40

GM41

GM42

GM43

GM44

GM45

GM46

GM47

GM48

GM49

GM50

SEE GM SERIES PRINTED BOARD HOLE PATTERN PAGE FOR CONNECTOR VARIANT CONTACT HOLE POSITIONS

MATERIAL: GLASS FILLED DIALEYL PHTHALATE PER ASTM-D-5948 TYPE SDG-F

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
CONTACT HOLE POSITION
DIMENSIONS AND PRINTED BOARD HOLE PATTERN
MATING FACE OF FEMALE CONNECTOR OR REAR FACE OF MALE CONNECTOR

SUGGEST 0.120 [3.05] Ø HOLES IN PRINTED BOARD FOR CONNECTOR MOUNTING HOLES
SUGGEST 0.040 [1.02] Ø HOLE IN PRINTED BOARD FOR CONTACT TERMINATIONS

HOLE IDENTIFICATION FOR REFERENCE ONLY
CONTACT HOLE POSITION DIMENSIONS AND PRINTED BOARD HOLE PATTERN

MATING FACE OF FEMALE CONNECTOR OR REAR FACE OF MALE CONNECTOR

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.

SUGGEST 0.120 [3.05] Ø HOLES IN PRINTED BOARD FOR CONNECTOR MOUNTING HOLES
SUGGEST 0.040 [1.02] Ø HOLE IN PRINTED BOARD FOR CONTACT TERMINATIONS

HOLE IDENTIFICATION FOR REFERENCE ONLY

TYPICAL MATING ASSEMBLY

GM41MSCE100J0 GMPL41F0T00
### Standard Density Rectangular Connectors

**Ordering Information - Code Numbering System**

Specify Complete Connector By Selecting An Option From Step 1 Through 9

#### Example

<table>
<thead>
<tr>
<th>STEP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>GM</td>
<td>41</td>
<td>M</td>
<td>SC</td>
<td>E1</td>
<td>0</td>
<td>0</td>
<td>J</td>
<td>0</td>
<td>/AA</td>
<td></td>
<td>-14</td>
</tr>
</tbody>
</table>

#### Step 1 - Basic Series

GM Series.

#### Step 2 - Connector Variants

7, 8, 9, 14, 18, 20, 21, 26, 34, 41, 50

#### Step 3 - Connector Gender

M - Male insulator.  
F - Female insulator.

#### Step 4 - Contact Termination Type

- **SC** - Solder cup, for closed entry female contact specify ‘CE’ in Step 10.  
- **DS3** - Straight solder 0.093 [2.36].  
- **DS4** - Straight solder 0.125 [3.18].  
- **DS5** - Straight solder 0.156 [3.96].  
- **DS6** - Straight solder 0.187 [4.75].

#### Step 5 - Polarizing Guides and Jackscrew System

- **G** - Polarizing grounding guides.  
- **N** - Polarizing guides, only option offered for size 8 connectors.  
- **NSS** - Stainless steel polarizing guides.  
- **T** - Fixed jackscrews.  
- **E** - Short turnable jackscrews, offered with set screw option.  
- **EL** - Long turnable jackscrews, offered with set screw option.  
- **E1** - Turnable jackscrews used on 9, 14, 18, 20, 21, 26 and 41 variant hoods, offered with set screw option.  
- **0** - If no polarizing guides or jackscrews are required. Also, use “0” if ordering hoods equipped with jackscrews for sizes 34 and 50, see Step 8.

#### Step 6 - Shells and Mounting Plates

- **P** - Male shell, not available on 41 variant.  
- **R** - Female shell, not available on 41 variant.  
- **H** - Mounting plate, not available on 41 variant.  
- **W** - Male shell with mounting plate.  
- **U** - Female shell with mounting plate.  
- **0** - If no shells or mounting plates are required.

#### Step 7 - Polarization Positions of Shells

Select letter to designate position of male pin and female slot for polarization system.  
- **A, B, C, D, E, F, G**  
- **0** - If no polarization is required or if no shells are required.

#### Step 8 - Cable Adapters (Hoods)

- **J** - Top opening hood (formed).  
- **L** - Side opening hood (formed).  
- **Y** - Top opening hood (formed), equipped with stainless steel jack-screw system, offered on 34 and 50 variants.  
- **I** - Side opening hood (formed), equipped with stainless steel jack-screw system, offered on 34 and 50 variants.  
- **Z** - Top opening hood (drawn, side access), equipped with stainless steel jack-screw system, offered on 34 and 50 variants.  
- **V** - Side opening hood (drawn, side access), equipped with stainless steel jack-screw system, offered on 34 and 50 variants.  
- **0** - If no hoods are required.

#### Step 9 - Additional Features

- **B** - For black anodized aluminum parts.  
- **C** - Set screw option, offered on the E, EL and E1 jackscrew systems.  
- **R** - For yellow chromate coating on aluminum parts.  
- **V** - Lock tab, offered on 7, 9, 14, 18, 20, 21, 26, 34 and 41 variants.  
- **VL** - Lock lever, offered on 7, 9, 14, 18, 20, 21, 26, 34 and 41 variants.  
- **0** - If no additional options are required.

#### Step 10 - Environmental Compliance Options

- **/AA** - Compliant per EU Directive 2002/95/EC (RoHS)

**NOTE:** If compliance to environmental legislation is not required, this step will not be used. Example: GM41MSCE100J0

---

*NOTE: For details of items listed in steps 5 through 9, see High Density Rectangular Connector Accessories Section on pages 51-66.*
VIBRATION LOCKS (V,VL)

(V) - VIBRATION TABS

(VL) - VIBRATION LEVER ASSEMBLY

SPECIFY CODE “V” OR “VL” IN STEP 9 OF ORDERING INFORMATION

MATERIAL: COPPER ALLOY

FINISH: ZINC PLATE WITH CHROMATE SEAL

ON MALE CONNECTOR THE FEMALE GUIDE OR JACKSCREW IS LOCATED AT CONTACT POSITION A OR NO. 1

Typical Part Number: GMCT34FON000V

Typical Part Number: GMCT34M0N000VL

TYPICAL MATING ASSEMBLY

GAPL14M0NVLB

GMCT14F0N0JVL

FLUSH PANEL CONNECTOR MOUNTING BRACKETS

MATERIAL: COPPER ALLOY

FINISH: ZINC WITH CHROMATE SEAL

<table>
<thead>
<tr>
<th>CONNECTOR VARIANTS</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 THRU 75</td>
<td>80023-2</td>
</tr>
<tr>
<td>60 AND 104</td>
<td>80023-4</td>
</tr>
</tbody>
</table>
ACCESSORIES FOR
RECTANGULAR CONNECTORS

JACKSCREW SYSTEM DIMENSIONS (T, E, EL, ESS)
QUALIFIED TO MIL-DTL-28748

(T) FIXED JACKSCREWS
(E) SHORT TURNABLE JACKSCREWS
(EL) LONG TURNABLE JACKSCREWS *
(ESS) SHORT TURNABLE JACKSCREWS

POSITIVE RETENTION FOR GROUNDING PURPOSES

POLARIZING GUIDE DIMENSIONS (N, NSS, G)
QUALIFIED TO MIL-DTL-2874

ON A MALE CONNECTOR, THE FEMALE GUIDE OR FEMALE JACKSCREW IS LOCATED AT THE END WITH CONTACT POSITION A OR NO. 1
METRIC THREADS AVAILABLE, SEE PAGE 55

*NOT OFFERED ON GM8 CONNECTOR VARIANT

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
### Polarizing Guides (N, NSS, G)

#### N-Polarizing Guides
- **Material and Finish**: Copper Alloy with Nickel Plate
- **Used On Connector Variants**: 7 and 9 through 75
- **A Ø**: 0.124 [3.15] for 7 and 9 through 75, 0.124 [3.15] for 60 and 104

#### NSS-Polarizing Guides
- **Material and Finish**: Stainless Steel Passivated
- **Used On Connector Variants**: 7 and 9 through 75
- **A Ø**: 0.124 [3.15] for 7 and 9 through 75, 0.124 [3.15] for 60 and 104

#### G-Polarizing Grounding Guides
- **Material and Finish**: Copper Alloy with Nickel Plate
- **Used On Connector Variants**: 7 and 9 through 75
- **A Ø**: 0.124 [3.15] for 7 and 9 through 75, 0.124 [3.15] for 60 and 104

**Hex Nuts and Lockwashers**
- **Material and Finish**: For N, NSS, and G guides
- **Stud Thread**: 4-40 UNC-2A is standard, metric threads available upon request

**Nut Driver**
- **Part Number**: 9535-1 for 4-40 threads, 9535-2 for 6-32 threads
FIXED AND TURNABLE JACKSCREW SYSTEM (T, E, EL)

SEE PAGE 55 FOR THREAD INFORMATION

**ACCESSORIES FOR RECTANGULAR CONNECTORS**

**T - FIXED JACKSCREWS**

**E - SHORT TURNABLE JACKSCREWS**

"E" AND "EL" OPTIONS USING ROLL PINS MAY HAVE SOLID WIRE THREADED THROUGH THE ROLL PINS AS AN ANTI-ROTATION MEASURE.

**EL - LONG TURNABLE JACKSCREWS**

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
### ACCESSORIES FOR RECTANGULAR CONNECTORS

**FIXED AND TURNABLE JACKSCREW SYSTEMS (T, E, EL)**

**COUPLING THREAD SIZES ONLY**

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<td>60 AND 104</td>
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* SET SCREW OPTION AVAILABLE ON STAINLESS STEEL TURNABLE JACKSCREWS WITH 6-32 THREADS ONLY

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**DIMENSIONS ARE IN INCHES [MILLIMETERS].**

**ALL DIMENSIONS ARE SUBJECT TO CHANGE.**
POLARIZATION OF MALE AND FEMALE SHELLS
QUALIFIED TO MIL-DTL-28748

Polarization is accomplished with shells by a pin and slot arrangement. Female shells are slotted to accept non-magnetic stainless steel polarizing pins mounted on the male shells.

There are 7 polarizing positions available which are designated by the letters A, B, C, D, E, F or G. Nonpolarized shells are designated by “O” and are supplied without slot and pin. See ordering chart.

DIMENSIONS FOR FEMALE SHELLS (R)
QUALIFIED TO MIL-DTL-28748

<table>
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<tr>
<th>FIGURE</th>
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<th>C</th>
<th>D</th>
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POLARIZING PIN
R.0.062 [1.57]

Ø 8 HOLES
0.120 [3.05]

Typical Part Number:
G34000PD000
Typical Part Number:
G34000RD000

MATERIAL:
0.040 [1.02] THICK ALUMINUM
FINISH:
YELLOW OR BLACK ANODIZE

ACCESSORIES FOR RECTANGULAR CONNECTORS

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.

56
DIMENSIONS FOR MALE SHELLS (P)
QUALIFIED TO MIL-DTL-28748

FIGURE 1

FIGURE 2

FIGURE 3

<table>
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<th>FIGURE</th>
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<th>B</th>
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FIGURE

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.

MATERIAL: 0.040 [1.02] THICK ALUMINUM
FINISH: YELLOW OR BLACK ANODIZE
ACCESSORIES FOR
RECTANGULAR CONNECTORS

DIMENSIONS FOR MOUNTING PLATES (H)
QUALIFIED TO MIL-DTL-28748

Mounting plates provide a simple, economical means of mounting the connector to any supporting surface. They can be used with or without shells and are available with floating bushings for “blind mountings” to facilitate alignment and coupling of the connector.

**FIGURE 1**

**FIGURE 2**

**FIGURE 3**

**FIGURE 4**

**TABLE 1**

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**MATERIAL:** ALUMINUM

**FINISH:** YELLOW OR BLACK ANODIZE

FOR FLOATING BUSHING OPTION USE CODE “FB” IN STEP 9 OF ORDERING INFORMATION

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
### CABLE ADAPTERS

**DIMENSIONS FOR TOP OPENING HOODS (J,Q)**

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**ALL DIMENSIONS ARE SUBJECT TO CHANGE.**

---

**PLASTIC CABLE CLAMPS FOR RIGID CABLE SUPPORT ARE AVAILABLE ON HOODS FOR CONTACT VARIANTS 34, 42 AND 50. SEE PAGE 64.**

**MATERIAL: HOODS, CABLE CLAMPS AND KNOBS - ALUMINUM, YELLOW OR BLACK ANODIZE.**

**DESKIRTED HOODS AVAILABLE.**

**HOODS HAVE THREADED MOUNTING HOLES FOR USE WITH POLARIZING GUIDES TO ATTACH TO CONNECTOR.**

---

**DIMENSIONS ARE IN INCHES [MILLIMETERS].**

**ALL DIMENSIONS ARE SUBJECT TO CHANGE.**
### ACCESSORIES FOR RECTANGULAR CONNECTORS

**CABLE ADAPTERS**

**DIMENSIONS FOR SIDE OPENING HOODS (L,S)**

---

#### FIGURE 1

![Figure 1 Image]

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#### FIGURE 2

![Figure 2 Image]

#### FIGURE 3

![Figure 3 Image]

**MATERIAL:** HOODS, CABLE CLAMPS AND KNOBS - ALUMINUM, YELLOW OR BLACK ANODIZE

HOODS HAVE THREADED MOUNTING HOLES FOR USE WITH POLARIZING GUIDES TO ATTACH TO CONNECTOR

DESKIRTED HOODS AVAILABLE

DIMENSIONS ARE IN INCHES [MILLIMETERS].

ALL DIMENSIONS ARE SUBJECT TO CHANGE.
## Cable Adapters

### Dimensions for Top Opening Hoods with Jackscrew System (J, Y, Z)

#### FIGURE 1

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<th>FIGURE</th>
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<th>B</th>
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**Material:** Hoods, cable clamps and knobs - aluminum, yellow or black anodize

**Jackscrews:** Stainless steel, passivated, see page 55 for thread information

**Metric Threads:** Metric threads available on zinc plated steel jackscrews

**Deskirted Hoods Available**

---

**DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.**

*When supplied with a female or male shell, the jackscrew mating lengths 0.161 [4.09] shall be 0.121 [3.07] and the 0.165 [4.19] shall be 0.125 [3.18]*
### CABLE ADAPTERS

#### DIMENSIONS FOR SIDE OPENING HOODS WITH JACKSCREW SYSTEM (L,I,V)

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**Material:** Hoods, cable clamps and knobs - Aluminum, yellow or black anodize

Jackscrews - Stainless steel, passivated. See page 55 for thread information

M 3 x 0.5 metric threads available on zinc plated steel jackscrews

Deskirted hoods available upon request

*When supplied with a female or male shell, the jackscrew mating lengths 0.161 [4.09] shall be 0.121 [3.07] and the 0.165 [4.19] shall be 0.125 [3.18].

---

**FIGURE 2**

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**DIMENSIONS ARE IN INCHES (MILLIMETERS). ALL DIMENSIONS ARE SUBJECT TO CHANGE.** 62
CABLE ADAPTERS
DIMENSIONS FOR SIDE ACCESS HOODS WITH JACKSCREW SYSTEM (Z,V)

FIGURE 1

FIGURE 2

- ACCESSORIES FOR RECTANGULAR CONNECTORS
- MATERIAL: HOODS AND KNOBS - ALUMINUM, YELLOW OR BLACK ANODIZE
- CABLE CLAMPS - ALUMINUM, YELLOW OR BLACK ANODIZE
- JACKSCREW - STAINLESS STEEL, PASSIVATED, 6-32 THREADS STANDARD
- M3 x 0.5 METRIC THREADS AVAILABLE
EMI/RFI SHIELDED HOOD

HOOD, CABLE CLAMPS AND KNOBS
MATERIAL: ALUMINUM, YELLOW IRIDITE
JACKSCREWS MATERIAL: STAINLESS STEEL
SHIELD ENVELOP MATERIAL: CONDUCTIVE FABRIC
TYPICAL SHIELDING EFFECTIVENESS AVERAGES 60 dB IN THE RANGE OF 10 MHz - 1 GHz

AVAILABLE IN CONNECTOR VARIANTS 14, 20, 34 AND 50
CONTACT TECHNICAL SALES FOR ORDERING INFORMATION

TOP OPENING HOODS WITH JACKSCREW SYSTEM AND PLASTIC CABLE CLAMPS
FOR RIGID CABLE SUPPORT

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CABLE CLAMPS MATERIAL - COMPOSITE STANDARD, GLASS FILLED POLYESTER OPTION
ALUMINUM MATERIAL WITH YELLOW OR BLACK ANODIZE FINISH ALSO AVAILABLE FOR CABLE CLAMPS

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
EMI/RFI SHIELDED CABLE ADAPTER (HOOD) AND SHELLS (Z2, R2, P2) FOR USE WITH SIZE 34 CONNECTOR VARIANTS
DEEP DRAWN STEEL CONSTRUCTION

**SHIELDED TOP OPENING HOOD (Z2)**

![Shielded Top Opening Hood (Z2)](image)

**SHIELDED FEMALE SHELL (R2)**

![Shielded Female Shell (R2)](image)

**SHIELDED MALE SHELL (P2)**

![Shielded Male Shell (P2)](image)

Materials and Finishes:
- Hood: Steel, nickel plate, or tin plate.
- Cable Clamp: Plastic, nickel plate.
- Jackscrews: Stainless steel, passivated.
- Knobs: Aluminum, anodized.

Materials and Finishes:
- Steel, nickel plate, or tin plate.
- Aluminum, yellow chromate conversion.
**ACCESSORIES FOR RECTANGULAR CONNECTORS**

**PANEL CUT-OUT DIMENSIONS FOR GM SERIES AND GMCT SERIES CONNECTORS**

**FIGURE 1**

**FIGURE 2**

**FIGURE 3**

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DIMENSIONS ARE IN INCHES (MILLIMETERS).

ALL DIMENSIONS ARE SUBJECT TO CHANGE.
Positronic Industries’ grounding plates were designed especially for aircraft applications where shielded cable must be grounded to the aircraft frame. The ground wires of the shielded cable are piggy-backed out of the cable with ferrules and are crimped to Size 16 female contacts. The female contacts are loaded into standard 14 or 34 contact connector housings. These connectors can then be mated to the grounding plate which is fastened to the aircraft frame.

Grounding plates have Size 16 precision-machined male contacts which are swaged and soldered onto the metal plate.

The metal plates (angled and plane) have fixed female jackscrews that accept the rotating jackscrews, which are an integral part of the mating female connector. Long rotating jackscrews extend beyond the edge of the cable adapter of the 14-contact female connector which permits easy coupling to the grounding plate.

Other contact variants are available for grounding plate applications. Contact Technical Sales for information on the availability of other grounding plates offered by Positronic Industries.

### MATERIALS AND FINISHES:

- **Insulator:** Glass-filled DAP per MIL-M-14, Type SDG-F. Grey or black in color.
- **Grounding Plates:** Copper alloy with tin plate.
- **Contacts:** Copper alloy with 0.000010 inch [0.25 microns] gold over nickel plate.
- **Jackscrew System:** Stainless steel, passivated.
- **Strain Reliefs:** Steel with zinc plate and chromate seal or aluminum with yellow anodize.

### MECHANICAL CHARACTERISTICS:

- **Removable Female Contacts:** Insert contact to rear face of insulator, release from front face of insulator. “Closed Entry” design for highest reliability.
- **Contact Retention in Insulator:** 20 lbs. (89N) after 10 cycles of contact insertion/extraction.
- **Female Contact Termination:** Crimp wires, Sizes 20 AWG [0.5 mm²] through 24 AWG [0.25 mm²].
- **Jackscrews:** 6-32 UNC threads.

### ELECTRICAL CHARACTERISTICS:

- **Contact Current Rating:** 13 amperes nominal.
- **Insulation Resistance:** 5 G ohms.
- **Working Voltage:** 500 VAC (rms).
- **Working Temperature:** -65°C to 150°C.
**GROUNDING PLATE COMPONENT DESCRIPTION**

**CONNECTION COMPONENT DESCRIPTIONS**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COMPONENT DESCRIPTIONS</th>
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<tbody>
<tr>
<td>A</td>
<td>Female Contacts, Size 16, Crimp Terminations.</td>
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<tr>
<td>B</td>
<td>Female Connector Insulator.</td>
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<tr>
<td>C1</td>
<td>Fixed Jackscrew.</td>
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<tr>
<td>C2</td>
<td>Rotating Jackscrew.</td>
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<td>D</td>
<td>Strain Relief provides cable support.</td>
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<td>E</td>
<td>Grounding Plate.</td>
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**TYPICAL PART NUMBER:**

- SK2114
- SK2113
Grounding plates are offered in five (5) different configurations, as shown below. These grounding plates can be used with the connector strain relief assemblies shown to the right below. The connector strain relief assemblies are provided with an appropriate number of FC120N2 female contacts. The FC120N2 contacts feature a “Closed Entry” design and accommodate wire sizes 20 - 24 AWG (0.5 - 0.25 mm²). Reference the schematics below for dimensional information. Use the indicated part numbers below to order your grounding plate assemblies from Positronic Industries.

For this grounding plate, order part number: SK2484

For this grounding plate, order part number: SK2665

For this grounding plate, order part number: SK2114

For this grounding plate, order part number: SK2664

GROUNDING PLATES DESIGNED FOR AIRCRAFT APPLICATIONS

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
For this connector strain relief assembly, order part number:
GMCT14F0EX00A0-697.0

A plastic cable tie is supplied with this connector.

FC120N2 FEMALE CONTACT “CLOSED ENTRY” DESIGN

(ENLARGED)
The appropriate number of contacts are supplied with the connectors. These crimp termination contacts accommodate wire sizes 20 - 24 AWG (0.5 - 0.25 mm²). Contact Technical Sales for crimp tool ordering information.

For this connector strain relief assembly, order part number:
SK2113
### Chart #1 Male Connectors

#### Part Number Explanations

<table>
<thead>
<tr>
<th>Step 1 – Basic Part Number</th>
<th>M28748/3-</th>
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**Step 2 – Insert Size**
- B - 9 Contact Variant
- C - 14 Contact Variant
- D - 20 Contact Variant
- E - 26 Contact Variant
- F - 34 Contact Variant
- G - 42 Contact Variant
- H - 50 Contact Variant
- J - 66 Contact Variant
- K - 75 Contact Variant
- L - 104 Contact Variant

**Step 3 – Shield/Retaining Plate**
- Shield:
  - 1 - Top Opening Hood (Size 9/50 & 75)
  - 2 - Side Opening Hood (Size 9/50 & 75)
  - 3 - Top Opening Hood (Size 66/104)
  - 4 - Side Opening Hood (Size 66/104)
  - 0 - None

**Retaining Plate**
- 5 - Retaining Plate (Size 9/26)
- 6 - Retaining Plate (Size 34-75, except Size 66)
- 7 - Retaining Plate (Size 66/104)

**Step 4 – Shell**
- A - A (Polarized Plug)
- B - B (Polarized Plug)
- C - C (Polarized Plug)
- D - D (Polarized Plug)
- E - E (Polarized Plug)
- F - F (Polarized Plug)
- G - G (Polarized Plug)
- H - H (Unpolarized Plug)
- J - J (A - A (Polarized Receptacle))
- K - K (B - B (Polarized Receptacle))
- L - L (C - C (Polarized Receptacle))
- M - M (D - D (Polarized Receptacle))
- N - N (E - E (Polarized Receptacle))
- P - P (F - F (Polarized Receptacle))
- Q - Q (G - G (Polarized Receptacle))
- R - R (Unpolarized Receptacle)
- 0 - None

**Step 5 – Jackscrews/Guide Pins**
- L - Long Jackscrews/Shields Only
- S - Short Jackscrews (No Shield)
- F - Fixed Jackscrews (No Shield)
- G - Guide Pins (No Shield)
- 0 - None

**Step 6 – Contacts**
- 1A - Size 20 Contacts

#### Additional Information

- See GM Series Connectors pages 45-50 and Accessories pages 51-66

---

### Chart #2 Female Connectors

#### Part Number Explanations

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<th>Step 1 – Basic Part Number</th>
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**Step 2 – Insert Size**
- B - 9 Contact Variant
- C - 14 Contact Variant
- D - 20 Contact Variant
- E - 26 Contact Variant
- F - 34 Contact Variant
- G - 42 Contact Variant
- H - 50 Contact Variant
- J - 66 Contact Variant
- K - 75 Contact Variant
- L - 104 Contact Variant

**Step 3 – Shield/Retaining Plate**
- Shield:
  - 1 - Top Opening Plate (Size 9/26)
  - 2 - Retaining Plate (Size 34-50, except Size 66)
- 0 - None

**Retaining Plate**
- 7 - Retaining Plate (Size 9/26)
- 8 - Retaining Plate (Size 34-50)

**Step 4 – Shell**
- A - A (Polarized Plug)
- B - B (Polarized Plug)
- C - C (Polarized Plug)
- D - D (Polarized Plug)
- E - E (Polarized Plug)
- F - F (Polarized Plug)
- G - G (Polarized Plug)
- H - H (Unpolarized Plug)
- J - J (A (Polarized Receptacle))
- K - K (B (Polarized Receptacle))
- L - L (C (Polarized Receptacle))
- M - M (D (Polarized Receptacle))
- N - N (E (Polarized Receptacle))
- P - P (F (Polarized Receptacle))
- Q - Q (G (Polarized Receptacle))
- R - R (Unpolarized Receptacle)
- 0 - None

**Step 5 – Jackscrews/Guide Pins**
- L - Long Jackscrews/Shields Only
- S - Short Jackscrews (No Shield)
- F - Fixed Jackscrews (No Shield)
- G - Guide Pins (No Shield)
- 0 - None

**Step 6 – Contacts**
- 1A - Size 20 Contacts

#### Additional Information

- See GM Series Connectors pages 45-50 and Accessories pages 51-66

---

### Chart #3 Male Connectors

#### Part Number Explanations

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**Step 2 – Insert Size**
- A - 7 Contact Variant
- B - 9 Contact Variant
- C - 14 Contact Variant
- D - 20 Contact Variant
- E - 26 Contact Variant
- F - 34 Contact Variant
- G - 42 Contact Variant
- H - 50 Contact Variant

**Step 3 – Shield/Retaining Plate**
- Shield:
  - 1 - Top Opening, use w/o shell (Size 9/26)
  - 2 - Side Opening, use w/o shell (Size 9/26)
  - 3 - Top Opening, use w/o shell (Size 34-50)
  - 4 - Side Opening, use w/o shell (Size 34-50)
  - 5 - Top Opening, use with Shell (Size 34-50)
  - 6 - Side Opening, use with Shell (Size 34-50)
- 0 - None

**Retaining Plate**
- 7 - Retaining Plate (Size 9/26)
- 8 - Retaining Plate (Size 34-50)

**Step 4 – Shell**
- A - A (Polarized Plug)
- B - B (Polarized Plug)
- C - C (Polarized Plug)
- D - D (Polarized Plug)
- E - E (Polarized Plug)
- F - F (Polarized Plug)
- G - G (Polarized Plug)
- H - H (Unpolarized Plug)
- J - J (A (Polarized Receptacle))
- K - K (B (Polarized Receptacle))
- L - L (C (Polarized Receptacle))
- M - M (D (Polarized Receptacle))
- N - N (E (Polarized Receptacle))
- P - P (F (Polarized Receptacle))
- Q - Q (G (Polarized Receptacle))
- R - R (Unpolarized Receptacle)
- 0 - None

**Step 5 – Jackscrews/Guide Pins**
- L - Long Jackscrews/Shields Only
- S - Short Jackscrews (No Shield)
- F - Fixed Jackscrews (No Shield)
- G - Guide Pins (No Shield)
- 0 - None

**Step 6 – Contacts**
- 1A - Size 20 Contacts

#### Additional Information

- See GM Series Connectors pages 45-50 and Accessories pages 51-66

---

### Chart #4 Female Connectors

#### Part Number Explanations

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**Step 2 – Insert Size**
- A - 7 Contact Variant
- B - 9 Contact Variant
- C - 14 Contact Variant
- D - 20 Contact Variant
- E - 26 Contact Variant
- F - 34 Contact Variant
- G - 42 Contact Variant
- H - 50 Contact Variant

**Step 3 – Shield/Retaining Plate**
- Shield:
  - 1 - Top Opening, use w/o shell (Size 9/26)
  - 2 - Side Opening, use w/o shell (Size 9/26)
  - 3 - Top Opening, use w/o shell (Size 34-50)
  - 4 - Side Opening, use w/o shell (Size 34-50)
  - 5 - Top Opening, use with Shell (Size 34-50)
  - 6 - Side Opening, use with Shell (Size 34-50)
- 0 - None

**Retaining Plate**
- 7 - Retaining Plate (Size 9/26)
- 8 - Retaining Plate (Size 34-50)

**Step 4 – Shell**
- A - A (Polarized Plug)
- B - B (Polarized Plug)
- C - C (Polarized Plug)
- D - D (Polarized Plug)
- E - E (Polarized Plug)
- F - F (Polarized Plug)
- G - G (Polarized Plug)
- H - H (Unpolarized Plug)
- J - J (A (Polarized Receptacle))
- K - K (B (Polarized Receptacle))
- L - L (C (Polarized Receptacle))
- M - M (D (Polarized Receptacle))
- N - N (E (Polarized Receptacle))
- P - P (F (Polarized Receptacle))
- Q - Q (G (Polarized Receptacle))
- R - R (Unpolarized Receptacle)
- 0 - None

**Step 5 – Jackscrews/Guide Pins**
- L - Long Jackscrews/Shields Only
- S - Short Jackscrews (No Shield)
- F - Fixed Jackscrews (No Shield)
- G - Guide Pins (No Shield)
- 0 - None

**Step 6 – Contacts**
- 1A - Size 20 Contacts

#### Additional Information

- See GM Series Connectors pages 45-50 and Accessories pages 51-66

---

**ORDERING INFORMATION**

FOR MIL-DTL-28748/3, MIL-DTL-28748/4, MIL-DTL-28748/5 AND MIL-DTL-28748/6

**Standard Density**

**Rectangular**

---

**QPL LISTING**

DIMENSIONS ARE IN INCHES (MILLIMETERS). ALL DIMENSIONS ARE SUBJECT TO CHANGE.
## CHART #5

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See GMCT Series contacts page 12.
Positronic Industries offers the listing below of connectors and connector accessories, which are products qualified under Military Specifications MIL-DTL-28748 and SAE AS 39029. For additional Q.P.L. connectors, please contact Technical Sales.

Positronic GMCT series connectors are Q.P.L. approved to MIL-DTL-28748.

Positronic GMCT series crimp removable contacts are Q.P.L. approved to SAE AS 39029.

Positronic GM series connectors are Q.P.L. approved to MIL-DTL-28748.

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XX Refer to charts #1 or #2 as applicable
* Refer to charts #5 or #6 as applicable
Positronic Products

**Power**
- Contact Sizes: 0, 8, 12, 16, 20 and 22
- Current Ratings: Up to 100 amperes
- Terminations: Crimp, wire solder, straight solder, right angle solder, straight press-fit and right angle (90°) press-fit
- Configurations: Multiple variants in a variety of package sizes
- Compliance: PICMG 2.11, PICMG 3.0, VITA 41
- **Features:** Hot swap capability • AC/DC operation in a single connector • Signal contacts for hardware management • Blind mating • Sequential mating • Large surface area contact mating system • Wide variety of accessories • Customer specified contact arrangements

**D-subminiature**
- Contact Sizes: 8, 16, 20 and 22
- Current Ratings: Up to 40 amperes nominal
- Terminations: Crimp, wire solder, straight solder, right angle (90°) solder and straight press-fit
- Configurations: Multiple variants in both standard and high densities
- **Features:** Three performance levels available: professional quality, military quality and space-flight quality provide multiple performance-to-cost choices • Options include thermocouple contacts, air coupling, environmentally sealed and dual port package including mixed density • Broad selection of accessories

**Rectangular**
- Contact Sizes: 16, 20 and 22
- Current Ratings: Up to 13 amperes
- Terminations: Crimp, wire solder, straight solder and right angle (90°) solder
- Configurations: Multiple variants in both standard and high densities
- Qualifications: MIL-DTL-28748, SAE AS 39029, CCITT V.35
- **Features:** Two performance levels available: industrial quality and military quality provide two performance to cost choices • Large surface area contact mating system • A wide variety of accessories • Broad selection of contact variants and package sizes

**Circular**
- Contact Sizes: 12, 16, 20 and 22
- Current Ratings: Up to 25 amperes nominal
- Terminations: Crimp, wire solder, straight solder and right angle (90°) solder
- Configurations: Multiple variants
- **Features:** Non-corrodible / lightweight composite construction • EMI/RFI shielded versions • Thermocouple contacts • Environmentally sealed versions • Rear insertion/front release of removable contacts • Two level sequential mating • Overmolding available on full assemblies

**Cable**
- Contact Sizes: 8, 12, 16, 20 and 22
- Current Ratings: Up to 40 amperes nominal
- Terminations: Feedthrough is standard; flying leads and board mount available upon request
- Configurations: See D-subminiature and circular configurations above
- Qualifications: Space-D32
- **Features:** Intended for use as an electrical feedthrough in high vacuum applications • Leakage rate: 5 x 10-9 mbar.l/s @ vacuum 1.5 x 10-5 atm • Signal, power, coax and high voltage versions available • Connectors can be mounted on flange assembly per customer specification

**Hermetic**
- Contact Sizes: 8, 12, 16, 20 and 22
- Current Ratings: Up to 40 amperes nominal
- Terminations: Feedthrough is standard; flying leads and board mount available upon request
- Configurations: See D-subminiature and circular configurations above
- Qualifications: Space-D32
- **Features:** Intended for use as an electrical feedthrough in high vacuum applications • Leakage rate: 5 x 10-9 mbar.l/s @ vacuum 1.5 x 10-5 atm • Signal, power, coax and high voltage versions available • Connectors can be mounted on flange assembly per customer specification

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Contact Sizes: 8, 12, 16, 20 and 22
Current Ratings: Up to 40 amperes nominal
Terminations: Crimp, wire solder, straight solder, right angle (90°) solder and straight press-fit
Configurations: Multiple variants
**Features:** Three performance levels available: professional quality, military quality and space-flight quality provide multiple performance-to-cost choices • Options include thermocouple contacts, air coupling, environmentally sealed and dual port package including mixed density • Broad selection of accessories

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Contact Sizes: 8, 16, 20 and 22
Current Ratings: Up to 40 amperes nominal
Terminations: Crimp, wire solder, straight solder, right angle (90°) solder and straight press-fit
Configurations: Multiple variants in both standard and high densities
**Features:** Three performance levels available: professional quality, military quality and space-flight quality provide multiple performance-to-cost choices • Options include thermocouple contacts, air coupling, environmentally sealed and dual port package including mixed density • Broad selection of accessories

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Contact Sizes: 16, 20 and 22
Current Ratings: Up to 13 amperes
Terminations: Crimp, wire solder, straight solder and right angle (90°) solder
Configurations: Multiple variants in both standard and high densities
Qualifications: MIL-DTL-28748, SAE AS 39029, CCITT V.35
**Features:** Two performance levels available: industrial quality and military quality provide two performance to cost choices • Large surface area contact mating system • A wide variety of accessories • Broad selection of contact variants and package sizes

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Contact Sizes: 12, 16, 20 and 22
Current Ratings: Up to 25 amperes nominal
Terminations: Crimp, wire solder, straight solder and right angle (90°) solder
Configurations: Multiple variants
**Features:** Non-corrodible / lightweight composite construction • EMI/RFI shielded versions • Thermocouple contacts • Environmentally sealed versions • Rear insertion/front release of removable contacts • Two level sequential mating • Overmolding available on full assemblies

---

Contact Sizes: 8, 12, 16, 20 and 22
Current Ratings: Up to 40 amperes nominal
Terminations: Feedthrough is standard; flying leads and board mount available upon request
Configurations: See D-subminiature and circular configurations above
Qualifications: Space-D32
**Features:** Intended for use as an electrical feedthrough in high vacuum applications • Leakage rate: 5 x 10-9 mbar.l/s @ vacuum 1.5 x 10-5 atm • Signal, power, coax and high voltage versions available • Connectors can be mounted on flange assembly per customer specification

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Contact Sizes: 8, 12, 16, 20 and 22
Current Ratings: Up to 40 amperes nominal
Terminations: Feedthrough is standard; flying leads and board mount available upon request
Configurations: See D-subminiature and circular configurations above
Qualifications: Space-D32
**Features:** Intended for use as an electrical feedthrough in high vacuum applications • Leakage rate: 5 x 10-9 mbar.l/s @ vacuum 1.5 x 10-5 atm • Signal, power, coax and high voltage versions available • Connectors can be mounted on flange assembly per customer specification

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All Positronic connector products can be supplied as part of cable assemblies whose technical characteristics would reflect those of the connectors being used within the assembly.

**Features:** Shorten the supply chain and reduce additional costs and delays by “cabling” • Overmolding available • Shielded and environmentally sealed versions available • Power cables and access boxes which meet the SAE J2496 specification

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For more information, visit www.connectpositronic.com or call your nearest Positronic sales office as given on the back of this catalog.
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China -Xian/Beijing Sales Office (86) 29 8839 5306 xian@connectpositronic.com
Korea Sales Office (82) 31 909 8047 or 8 korea@connectpositronic.com
Taiwan Sales Office (88) 62 2937 8775 taiwan@connectpositronic.com

JAPAN, Direct Sales Offices
Sales and Engineering Offices (81) 3 5812 7720 japan@connectpositronic.com

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Factory Sales and Engineering Offices (91) 20 2439 4810 india@connectpositronic.com
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New Delhi Sales Office delhi@connectpositronic.com

ASIA/PACIFIC, Technical Agents
Technical Agents in Malaysia, Australia, New Zealand, Philippines, Hong Kong, Vietnam, Thailand

EUROPEAN LOCATIONS

FRANCE, Auch Factory, European Headquarters
Factory Sales and Engineering Offices 33 5 62 63 44 91 contact@connectpositronic.com

EUROPE, Direct Sales Offices
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Southern France Sales Office 33 5 62 63 44 91 plafon@connectpositronic.com
Italy Sales Office 39 02 54 1161 06 rmagni@connectpositronic.com
Germany Sales Office 49 2351 63 47 39 cbouche@connectpositronic.com
UK Sales Office 44 1993 831 939 lbridwell@connectpositronic.com

EUROPE, Technical Agents
Technical Agents in Austria, Benelux, Eastern Europe Countries, Greece, Ireland, Scandinavia, Spain, Switzerland and the United Kingdom

MIDEAST, Technical Agents
Technical Agents in Israel and Turkey

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