

## AMPSEAL Connector Series

for Industrial & Commercial Transportation

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## AMPSEAL Connector Series

Our AMPSEAL connectors are designed for cable-to-board harsh environment applications. Environmentally sealed for rugged reliability, these connectors are available in cable plugs and PCB mount headers engineered to withstand extreme temperature and moisture, including high-temperature underhood applications.

The pre-assembled receptacle housing connector features built-in contact sealing and an integral interfacial seal that protects mated connectors. Rated to IP69K, AMPSEAL connectors are offered in arrangements from 8 to 35 positions. Available accessories include tool-less backshells, sealing plugs, and Connector Position Assurance (CPA).

## AMPSEAL Connector Series

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|                                      |         |
|--------------------------------------|---------|
| AMPSEAL Connector Series . . . . .   | 6 - 7   |
| AMPSEAL Housings & Headers . . . . . | 8 - 10  |
| AMPSEAL Accessories . . . . .        | 11 - 12 |
| AMPSEAL Contacts . . . . .           | 13 - 14 |
| Application Tooling . . . . .        | 15 - 16 |

## AMPSEAL Connector Series

for Industrial & Commercial Transportation

### BENEFITS

- Design flexibility with connectors and contacts supporting wire sizes from 16 to 24 AWG
- Secure positive contact seating through secondary contact locking and lanceless contacts.
- Protect from dust, water, and overspray with up to IP69K rugged sealing capabilities.
- Reduce tangling during storage and handling thanks to lanceless receptacle contacts.
- Reduce wire strain and ease assembly with tool-less backshells available for all housing sizes.
- Minimize mismatching and misidentification with different connector colors and mechanical polarized keyings.
- Connection security through CPA accessory.



### KEY INDUSTRIES



Truck



Bus



Construction



Agriculture



Special Vehicles



Marine



Two-Wheeler



Forklift



Power Generation

### APPLICATIONS



PCB Connection



Wire-to-Board



Power Distribution

## AMPSEAL Connector Series

for Industrial & Commercial Transportation

### PRODUCT DOCUMENTATION

Additional product documentation is available for assistance with AMPSEAL products.

The following documentation may be helpful:

|                  |   |
|------------------|---|
| <b>108-1329</b>  | Product Specification, AMPSEAL Connectors     |
| <b>114-16016</b> | Application Specification, AMPSEAL Connectors |

### PERFORMANCE SPECIFICATIONS

|                              |   |
|------------------------------|---|
| <b>Current</b>               | Up to 17 A gold, up to 8 A tin  |
| <b>Temperature</b>           | Operating at temperatures:<br>-40°C to +125°C for gold plated<br>-40°C to +105°C for tin plated   |
| <b>Mating Durability</b>     | See note.<br>Mate and unmate specimens for 10 cycles at maximum rate of 600 cycles per hour.  |
| <b>Insulation Resistance</b> | 100 megohms minimum.<br>TE Specification 109-28-4. Test between adjacent contacts of mated specimens.   |
| <b>IP Rating</b>             | IP67/IP69K with backshells  |
| <b>Random Vibration</b>      | See note. TE Specification 109-21-7, Condition G, except 10-500Hz frequency range.<br>Subject mated specimens to 10Gs for 8 hours each plane. |
| <b>Voltage</b>               | 250 V AC  |
| <b>Flammability</b>          | UL 94-V0-rated material   |

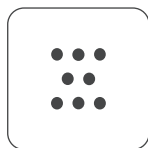
**Note:** Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 3 of TE product document 108-1329.

### MATERIAL SPECIFICATIONS

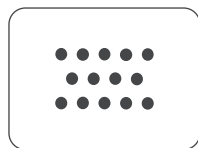
|                      |                 |
|----------------------|-----------------|
| <b>Wire Seal</b>     | Silicone rubber |
| <b>Mating Seal</b>   | Silicone rubber |
| <b>Cover</b>         | PBT             |
| <b>Housing</b>       | PBT             |
| <b>Locking Wedge</b> | PBT             |

## AMPSEAL Housings & Headers

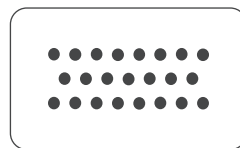
### CONFIGURATIONS



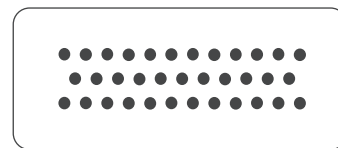
**8 Positions**  
8 size 1.3 mm



**14 Positions**  
14 size 1.3 mm

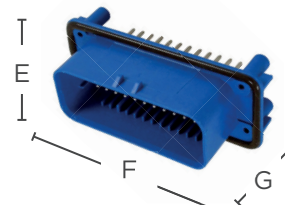
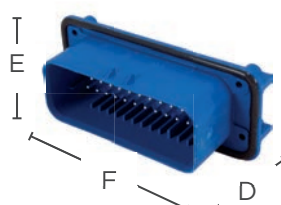


**23 Positions**  
23 size 1.3 mm



**35 Positions**  
35 size 1.3 mm

### DIMENSIONS



| Cavity | AMPSEAL Receptacle Housing |                     |                    | AMPSEAL Header           |                     |                    |                         |
|--------|----------------------------|---------------------|--------------------|--------------------------|---------------------|--------------------|-------------------------|
|        | Overall Length<br>A        | Overall Height<br>B | Overall Width<br>C | Overall Length 180°<br>D | Overall Height<br>E | Overall Width<br>F | Overall Length 90°<br>G |
|        | Inch (mm)                  |                     |                    |                          |                     |                    |                         |
| 8      | 1.32 (33.6)                | 1.36 (34.6)         | 1.08 (27.4)        | 1.35 (34.3)              | 1.26 (32.1)         | 1.61 (40.8)        | 1.49 (37.9)             |
| 14     | 1.32 (33.6)                | 1.36 (34.6)         | 1.39 (35.4)        | 1.35 (34.3)              | 1.26 (32.1)         | 1.92 (48.8)        | 1.49 (37.9)             |
| 23     | 1.32 (33.6)                | 1.36 (34.6)         | 1.87 (47.4)        | 1.35 (34.25)             | 1.26 (32.1)         | 2.39 (60.8)        | 1.49 (37.9)             |
| 35     | 1.32 (33.6)                | 1.36 (34.6)         | 2.50 (63.4)        | 1.35 (34.25)             | 1.26 (32.1)         | 3.03 (76.9)        | 1.49 (37.9)             |

Dimensions are for reference only

**AMPSEAL Housings & Headers**

**ORDERING INFORMATION - RECEPTACLE HOUSINGS**

| Position | Keyed Housing Color | Receptacle Housing                        |   |
|----------|---------------------|---|---|
|          |                     | 16-20 AWG<br>(1.5 - 0.5 mm <sup>2</sup> ) | 20-24 AWG<br>(0.5 - 0.2 mm <sup>2</sup> ) |
| 8        | Black               | 776286-1                                  | 2371882-1                                 |
| 8        | Natural             | 776286-2                                  | 2371882-2                                 |
| 14       | Black               | 776273-1                                  | 2371883-1                                 |
| 14       | Natural             | 776273-2                                  | 2371883-2                                 |
| 14       | Gray                | 776273-4                                  | 2371883-4                                 |
| 14       | Blue                | 776273-5                                  | 2371883-5                                 |
| 23       | Black               | 770680-1                                  | 2371884-1                                 |
| 23       | Natural             | 770680-2                                  | 2371884-2                                 |
| 23       | Gray                | 770680-4                                  | 2371884-4                                 |
| 23       | Blue                | 770680-5                                  | 2371884-5                                 |
| 35       | Black               | 776164-1                                  | 2371885-1                                 |
| 35       | Natural             | 776164-2                                  | 2371885-2                                 |
| 35       | Gray                | 776164-4                                  | 2371885-4                                 |
| 35       | Blue                | 776164-5                                  | 2371885-5                                 |
| 35       | Orange              | 776164-6                                  | 2371885-6                                 |

**STICK HEADERS**

AMPSEAL stick headers are low profile pin carriers available for overmolding and integration into modules.



| Position | Contact Finish | Stick Header |
|----------|----------------|--------------|
| 8        | Tin plated     | 2301063-1    |
| 8        | Gold plated    | 2301063-2    |
| 23       | Tin plated     | 1740313-1    |
| 23       | Gold plated    | 2120833-1    |
| 35       | Tin plated     | 1103599-1    |

## AMPSEAL Housings & Headers

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### AMPSEAL Housings & Headers

#### ORDERING INFORMATION - HEADERS

| Position | Keyed Housing Color | Contact Finish | Right-Angle PCB Header |            | Vertical PCB Header |            |
|----------|---------------------|----------------|------------------------|------------|---------------------|------------|
|          |                     |                | Without Seal           | With Seal  | Without Seal        | With Seal  |
| 8        | Black               | Tin plated     | 776279-1               | 776280-1   | 776275-1            | 776276-1   |
| 8        | Black               | Gold plated    | 1-776279-1             | 1-776280-1 | 1-776275-1          | 1-776276-1 |
| 8        | Natural             | Tin plated     | 776279-2               | 776280-2   | 776275-2            | 776276-2   |
| 8        | Natural             | Gold plated    | 1-776279-2             | 1-776280-2 | 1-776275-2          | 1-776276-2 |
| 14       | Black               | Tin plated     | 776266-1               | 776267-1   | 776261-1            | 776262-1   |
| 14       | Black               | Gold plated    | 1-776266-1             | 1-776267-1 | 1-776261-1          | 1-776262-1 |
| 14       | Natural             | Tin plated     | 776266-2               | 776267-2   | 776261-2            | 776262-2   |
| 14       | Natural             | Gold plated    | 1-776266-2             | 1-776267-2 | 1-776261-2          | 1-776262-2 |
| 14       | Gray                | Tin plated     | 776266-4               | 776267-4   | 776261-4            | 776262-4   |
| 14       | Gray                | Gold plated    | 1-776266-4             | 1-776267-4 | 1-776261-4          | 1-776262-4 |
| 14       | Blue                | Tin plated     | 776266-5               | 776267-5   | 776261-5            | 776262-5   |
| 14       | Blue                | Gold plated    | 1-776266-5             | 1-776267-5 | 1-776261-5          | 1-776262-5 |
| 23       | Black               | Tin plated     | 770669-1               | 776087-1   | 776200-1            | 776228-1   |
| 23       | Black               | Gold plated    | 1-770669-1             | 1-776087-1 | 1-776200-1          | 1-776228-1 |
| 23       | Natural             | Tin plated     | 770669-2               | 776087-2   | 776200-2            | 776228-2   |
| 23       | Natural             | Gold plated    | 1-770669-2             | 1-776087-2 | 1-776200-2          | 1-776228-2 |
| 23       | Gray                | Tin plated     | 770669-4               | 776087-4   | 776200-4            | 776228-4   |
| 23       | Gray                | Gold plated    | 1-770669-4             | 1-776087-4 | 1-776200-4          | 1-776228-4 |
| 23       | Blue                | Tin plated     | 770669-5               | 776087-5   | 776200-5            | 776228-5   |
| 23       | Blue                | Gold plated    | 1-770669-5             | 1-776087-5 | 1-776200-5          | 1-776228-5 |
| 35       | Black               | Tin plated     | 776180-1               | 776163-1   | 776230-1            | 776231-1   |
| 35       | Black               | Gold plated    | 1-776180-1             | 1-776163-1 | 1-776230-1          | 1-776231-1 |
| 35       | Natural             | Tin plated     | 776180-2               | 776163-2   | 776230-2            | 776231-2   |
| 35       | Natural             | Gold plated    | 1-776180-2             | 1-776163-2 | 1-776230-2          | 1-776231-2 |
| 35       | Gray                | Tin plated     | 776180-4               | 776163-4   | 776230-4            | 776231-4   |
| 35       | Gray                | Gold plated    | 1-776180-4             | 1-776163-4 | 1-776230-4          | 1-776231-4 |
| 35       | Blue                | Tin plated     | 776180-5               | 776163-5   | 776230-5            | 776231-5   |
| 35       | Blue                | Gold plated    | 1-776180-5             | 1-776163-5 | 1-776230-5          | 1-776231-5 |
| 35       | Orange              | Gold plated    | 1-776180-6             | 1-776163-6 | -                   | 1-776231-6 |

## AMPSEAL Accessories

for Industrial & Commercial Transportation

### AMPSEAL Accessories

The accessory items available to complement the AMPSEAL connectors are backshells, sealing plugs, and CPA.

#### BACKSHELLS

AMPSEAL backshells offer a high level of protection and help reduce wire strain. They are made of heavy-duty thermoplastic and provide enhanced aesthetics for AMPSEAL connector applications.



| Pos | Part Number | Description  |
|-----|-------------|--|
| 8   | 2138529-1   | Vertical exit with wire relief<br>(a wire tie is recommended around the end of the backshell to aid in securing the halves together) |
| 14  | 2138530-1   |  |
| 23  | 2389806-1   |  |
| 35  | 2389807-1   |  |

**Note:** One half, two halves required per receptacle housing

#### SEALING PLUGS

Open cavities provide pathways for contaminants to enter the connectors. To maintain seal integrity, any unused cavity that has been pierced must be filled with the appropriate size sealing plug.



| Color   | Contact Size (mm) | Wire Size AWG (mm <sup>2</sup> ) | Part Number | Material |
|---------|-------------------|----------------------------------|-------------|----------|
| White   | 1.3               | 16 - 20<br>(1.5 - 0.5)           | 770678-1    | Nylon    |
| Natural | 1.3               | 20 - 24<br>(0.5 - 0.2)           | 776364-1    | Nylon    |

#### CONNECTOR POSITION ASSURANCE (CPA)

AMPSEAL Connector Position Assurance provides mating assurance and helps prevent accidental unmating of the connector. It can be used with all AMPSEAL receptacle housings.



| Color | Part Number | Material |
|-------|-------------|----------|
| Red   | 2373965-1   | PBT      |

## AMPSEAL Contacts

for Industrial & Commercial Transportation

### AMPSEAL Contacts

AMPSEAL connectors commonly use the 1.3 mm three contact beam lanceless stamped & formed contact system.



#### 1.3 MM CONTACT PERFORMANCE SPECIFICATIONS

| Durability             |  |
|------------------------|--|
| 10 cycles (tin & gold) |  |

| Current Rating    |                  |
|-------------------|------------------|
| Contact Size (mm) | Max. Current (A) |
| 1.3 (tin)         | Up to 8          |
| 1.3 (gold)        | Up to 17         |

| Contact Retention |  |
|-------------------|--|
| Contact Size (mm) | Max. Load  |
| 1.3               | Contacts shall not dislodge, applying an axial load of 115 N to contacts in the axial direction with wedgelock in locked position. |

| Crimp Tensile Strength |                      |
|------------------------|----------------------|
| Contact Size (AWG)     | Tensile Strength (N) |
| <b>1.3 mm</b>          |                      |
| 24                     | 50                   |
| 22                     | 50                   |
| 20                     | ≥ 80                 |
| 18                     | ≥ 90                 |
| 16                     | ≥ 150                |

## AMPSEAL Contacts

for Industrial & Commercial Transportation

## AMPSEAL Contacts

### 1.3 MM STAMPED & FORMED CONTACTS FOR AMPSEAL CONNECTORS

| Contact Size (mm) | Wire Size AWG (mm <sup>2</sup> ) | Insulation Diameter Inch (mm) | Finish                | Receptacle Part Numbers |                  |             |                  |
|-------------------|----------------------------------|-------------------------------|-----------------------|-------------------------|------------------|-------------|------------------|
|                   |                                  |                               |                       | Strip Form              | Package Quantity | Loose Piece | Package Quantity |
| 1.3               | 16 - 20<br>(1.5 - 0.5)           | 0.067 - 0.106<br>(1.7 - 2.7)  | Pre-tin plated        | 770520-1                | 25000            | 770854-1    | 5000             |
| 1.3               | 16 - 20<br>(1.5 - 0.5)           | 0.067 - 0.106<br>(1.7 - 2.7)  | Selective gold plated | 770520-3                | 25000            | 770854-3    | 5000             |
| 1.3               | 20 - 22<br>(0.5 - 0.3)           | 0.055 - 0.071<br>(1.4 - 1.8)  | Pre-tin plated        | 770520-5                | 25000            | /           | /                |
| 1.3               | 22 - 24<br>(0.3 - 0.2)           | 0.055 - 0.071<br>(1.4 - 1.8)  | Pre-tin plated        | 770520-6                | 25000            | /           | /                |
| 1.3               | 20 - 22<br>(0.5 - 0.3)           | 0.055 - 0.071<br>(1.4 - 1.8)  | Selective gold plated | 770520-8                | 25000            | /           | /                |
| 1.3               | 22 - 24<br>(0.3 - 0.2)           | 0.055 - 0.071<br>(1.4 - 1.8)  | Selective gold plated | 1-770520-1              | 25000            | /           | /                |

### AMPSEAL Wire Sealing, Sealing Plugs, and CPA

The wire sealing range is the recommended outside diameter of the wire insulation required to maintain an environmental seal in the rear connector cavities.

| Contact Size (mm) | Wire Size AWG (mm <sup>2</sup> ) | Standard Seal Inch (mm)      |
|-------------------|----------------------------------|------------------------------|
| 1.3               | 16 - 20<br>(1.5 - 0.5)           | 0.067 - 0.106<br>(1.7 - 2.7) |
| 1.3               | 20 - 24<br>(0.5 - 0.2)           | 0.055 - 0.71<br>(1.4 - 1.8)  |

## Application Tooling

for AMPSEAL Connector Series

### AMPSEAL CONNECTORS

#### TOOLING

Tools are specific to each contact style. To create a proper crimp and achieve high performance specifications, contacts must be crimped with the recommended tooling.



#### HAND TOOLS FOR 1.3 MM CONTACTS



PRO-CRIMPER III



CERTI-CRIMP II

| Wire Size<br>AWG (mm <sup>2</sup> ) | Receptacle<br>Strip Form<br>Part Number | Receptacle<br>Loose Piece<br>Part Number | Hand Tool<br>Part Number | Description                                       |
|-------------------------------------|---|--|--------------------------|---|
| 16 - 20<br>(1.5 - 0.5)              | 770520-1<br>770520-3                    | 770854-1<br>770854-3                     | 58529-1                  | PRO-CRIMPER III<br>hand tool and die set assembly |
| 16 - 20<br>(1.5 - 0.5)              | 770520-1<br>770520-3                    | 770854-1<br>770854-3                     | 2217748-1                | CERTI-CRIMP II<br>straight action hand tool       |
| 20 - 22<br>(0.5 - 0.3)              | 770520-8<br>770520-5                    | /  | 2396182-1                | CERTI-CRIMP II<br>straight action hand tool       |
| 22 - 24<br>(0.3 - 0.2)              | 1-770520-1<br>770520-6                  | /  | 2396101-1                | CERTI-CRIMP II<br>straight action hand tool       |

**Note:** Base PRO-CRIMPER III tool part number with -2 suffix is the part number for the die set, which can be ordered separately.

#### AUTOMATED TOOLING FOR 1.3 MM CONTACTS



| Wire Size<br>AWG (mm <sup>2</sup> ) | Receptacle<br>Strip Form<br>Part Number | Applicator<br>Part Number | Description                                       |
|-------------------------------------|---|---------------------------|---|
| 16 - 20<br>(1.5 - 0.5)              | 770520-1<br>770520-3                    | 2151376-1                 | OCEAN end feed applicator<br>with mechanical feed |
| 16 - 20<br>(1.5 - 0.5)              | 770520-1<br>770520-3                    | 2151376-2                 | OCEAN end feed applicator<br>with pneumatic feed  |
| 20 - 22<br>(0.5 - 0.3)              | 770520-8<br>770520-5                    | 2837821-1                 | OCEAN end feed applicator<br>with pneumatic feed  |
| 22 - 24<br>(0.3 - 0.2)              | 1-770520-1<br>770520-6                  | 2837822-1                 | OCEAN end feed applicator<br>with pneumatic feed  |

**Note:** Applicators with additional feed styles are available; please contact your TE representative.

## AMPSEAL CONNECTORS

### HOW-TO INSTRUCTIONS

#### CONTACT INSERTION



##### Step 1

Grasp crimped contact approximately one inch behind the contact barrel.



##### Step 2

Check that the wedgelock of the plug assembly is in open position. Align the contact with the applicable cavity.



##### Step 3

Insert the contact into the connector cavity until there is an audible and tactile click. A slight tug will verify the contact is locked in place.

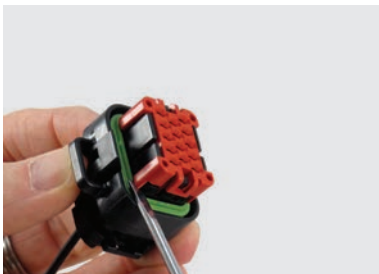


##### Step 4

After all the contacts have been inserted, close the wedgelock by simultaneously squeezing locking latches inward and pushing the wedgelock into the housing.

**Note:** AMPSEAL connector grommet is solid until pierced.

#### CONTACT REMOVAL



##### Step 1

Insert the tip of a screwdriver (2-5 mm wide blade) between the edge of the plug assembly housing and one corner of the wedgelock.



##### Step 2

Gently pry the edge of the wedgelock until it is released from (but not completely removed) the housing. Repeat these steps for the opposite corner of the wedge.



##### Step 3

Gently pull the wire of the contact to be removed while rotating the wire (a quarter turn each direction) back and forth until the contact is removed from the housing.

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## NOTES

A large grid of 20 columns and 30 rows of small dots. Several dots are highlighted in orange, indicating specific data points or markers. The orange dots are located at the following approximate coordinates (row, column): (1, 6), (2, 15), (3, 10), (4, 18), (5, 12), (6, 15), (7, 10), (8, 1), (9, 14), (10, 18), (11, 15), (12, 12), (13, 15), (14, 18), (15, 12), (16, 15), (17, 18), (18, 12), (19, 15), (20, 18), (21, 12), (22, 15), (23, 18), (24, 12), (25, 15), (26, 18), (27, 12), (28, 15), (29, 18), (30, 12).

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## NOTES

A large grid of 20 columns and 30 rows of small dots for taking notes. Several dots are highlighted in orange, indicating specific points of interest or errors. The highlighted dots are located at the following grid coordinates (row, column):

- (1, 6)
- (2, 15)
- (10, 2)
- (10, 10)
- (13, 14)
- (13, 19)
- (16, 11)
- (20, 17)
- (29, 6)
- (30, 20)

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## ABOUT TE CONNECTIVITY

TE Connectivity is a global industrial technology leader creating a safer, sustainable, productive, and connected future. Our broad range of connectivity and sensor solutions, proven in the harshest environments, enable advancements in transportation, industrial applications, medical technology, energy, data communications, and the home. With more than 85,000 employees, including over 8,000 engineers, working alongside customers in approximately 140 countries, TE ensures that EVERY CONNECTION COUNTS. Learn more at [www.te.com](http://www.te.com) and on LinkedIn, Facebook, WeChat and Twitter.

## LET'S CONNECT

We make it easy to connect with our experts and are ready to provide all the support you need. For additional information or product assistance, please contact your field representative or our customer service department. Additional information is also available on the website [te.com/ict](http://te.com/ict).

## TECHNICAL SUPPORT

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### TE Connectivity

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