

cannon

# Nemesis II Series Connectors Catalog



ITT

# Nemesis II Series

Miniature circular connector featuring Cannon breakaway functionality and high-pressure sealing capability for water submersion up to 20 meters.



Combining high speed, high mating and quick termination, the Nemesis II mini-circular interconnect provides a high performance, ruggedized interconnect solution for the extreme conditions and harsh environments.



Delivering reliable power, signal and data in a smaller, robust and integrated design package, our lightweight Nemesis II breakaway connector reduces mission-critical failures with a wipe proof pogo pad to remove FOD, Cannon breakaway coupling for rapid mating and custom overmolding and cabling options. Combined with watertight sealing at up to 20 meters, the Nemesis Series reduces soldiers physical loads while maintaining communication in any environment.

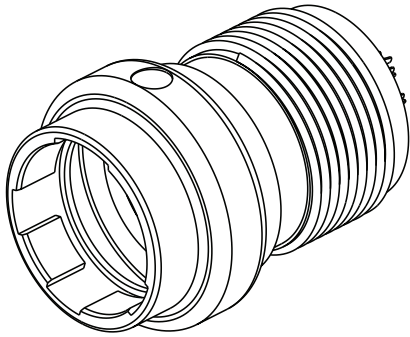
## Features & Benefits

- Dual Coupling with positive locking or Cannon Breakaway for rapid mating and demating
- High sealing capability with up to 20 meters submersible
- Easily terminates to wire, PCB and flex circuits
- Blind mating design
- Power, signal and data
- RoHS plating meeting the latest environmental standards
- Enhanced strain relief design with overmolding and custom cabling options
- 500 hour salt spray resistant plating
- Sealed in the mated and un-mated conditions
- Reliability up to 10,000 mating cycles

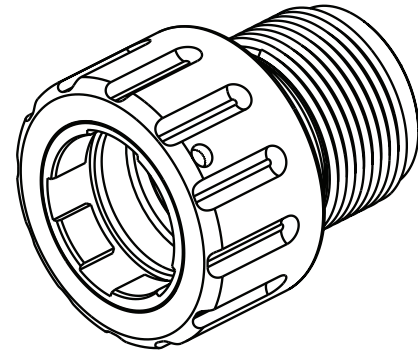
## Markets



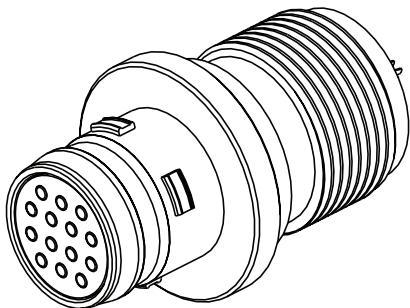
# Nemesis Configurations



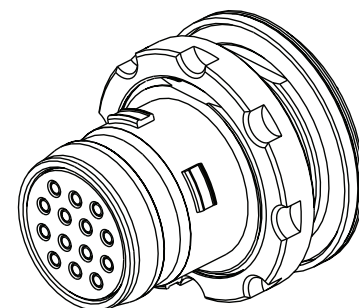
Standard Plug



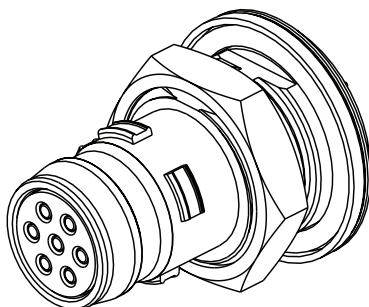
Dual Coupling Plug



Nemesis In-line Receptacle



Tamper Proof Jamnut



Hex Jamnut

# Mechanical Specifications

|                                 |   |
|---------------------------------|---|
| <b>Contact Type</b>             | Plugs - Pogo, Receptacles - Pogo Pad                                    |
| <b>Contacts</b>                 | Plugs - Solder cup, Receptacles - Solder cup or PCB tails               |
| <b>Wire size</b>                | 22-32 AWG   |
| <b>Vibration</b>                | 20 g's in accordance with MIL-STD-1344 Method 2005, Condition IV        |
| <b>Shock</b>                    | 50 g's in accordance with MIL-STD-1344 Method 2004, Condition E         |
| <b>Durability</b>               | 10K mating cycles standard, 5K mating cycles w/dual coupling            |
| <b>Plating</b>                  | RoHS compliant black electroless nickel or electroless nickel           |
| <b>Receptacle Mounting</b>      | Jamnut with standard hex nut or optional tamper proof nut               |
| <b>Coupling</b>                 | Snap-on/breakaway or dual coupling (rotate collar locking) - blind mate |
| <b>Coding</b>                   | 5 clocking positions, N, A, B, C, & D                                   |
| <b>Coding Identification</b>    | N=Blue, A=Red, B=Green, C=Gray, D=Yellow                                |
| <b>Snap-on/Break Away Force</b> | 30N (nominal)   |
| <b>Layouts (# of positions)</b> | 7, 8, 14 & 19   |
| <b>Material</b>                 | Shell assemblies - Stainless Steel                                      |
|                                 | Backshells - Brass  |
|                                 | Insulators - Thermoplastic  |
|                                 | Seals - Fluorosilicone Rubber   |
|                                 | Contacts - Copper Alloy w/gold over nickel plating                      |

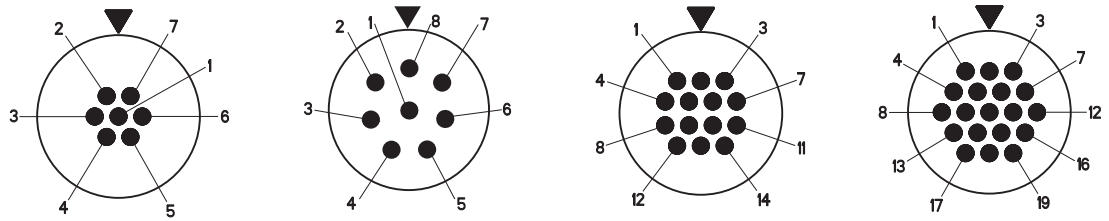
# Electrical Specifications

|                                  |   |
|----------------------------------|---|
| <b>Contact Current Rating</b>    | 2 Amps, 3 Amps peak   |
| <b>Insulation Resistance</b>     | 5,000 mOhm minimum  |
| <b>DWV, At Sea Level</b>         | 500 Volts   |
| <b>Contact Resistance</b>        | 15 mOhm maximum   |
| <b>EMI Shielding</b>             | 50dB attenuation 100MHz to 1000 MHz in terminated condition |
| <b>Shell to Shell Resistance</b> | <20m mOhm   |

# Environmental Specifications

|                        |   |
|------------------------|---|
| <b>Temperature</b>     | Operating: -55 °C - 125 °C  |
| <b>Sealing</b>         | IP67  |
| <b>Fluid Immersion</b> | Unmated connectors immersed in various fuels and oils shall have no damage detrimental to the operation of the connector components |
| <b>Salt Spray</b>      | 500 hours   |

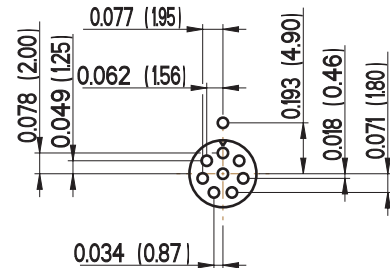
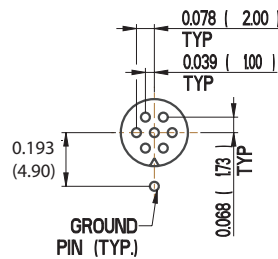
# Nemesis Contact Arrangements



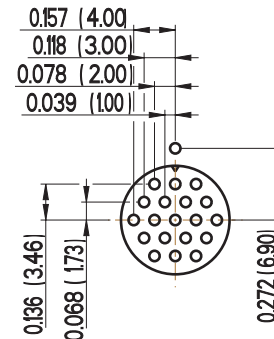
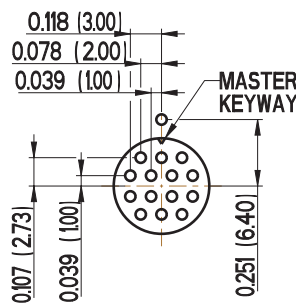
|                    |   |   |    |    |
|--------------------|---|---|----|----|
| Number of Contacts | 7 | 8 | 14 | 19 |
|--------------------|---|---|----|----|

Cavity identification numbers are for reference only. They do not appear on connectors.

## Nemesis PCB Layouts

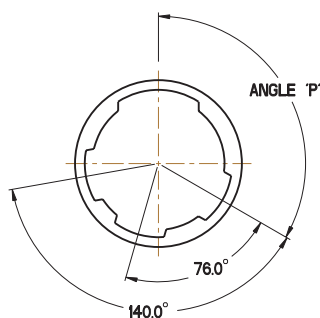


|                    |   |   |
|--------------------|---|---|
| Number of Contacts | 7 | 8 |
|--------------------|---|---|



|                    |    |    |
|--------------------|----|----|
| Number of Contacts | 14 | 19 |
|--------------------|----|----|

## Nemesis Clocking



Face View of Plug  
Keyway Orientation

| Polarization Coding |                                 |           |
|---------------------|---------------------------------|-----------|
| Letter              | Color Coded<br>Paint Line / Dot | Angle 'P' |
| N                   | Blue                            | 120°      |
| A                   | Red                             | 132°      |
| B                   | Green                           | 108°      |
| C                   | Grey                            | 96°       |
| D                   | Yellow                          | 84°       |

# Nemesis Ordering Guide- Standard & Dual Coupling Plug



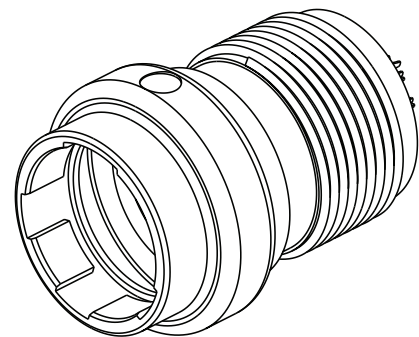
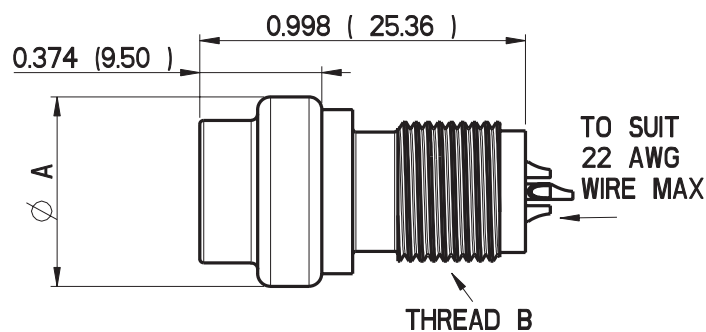
|                     |        |   | NEM | QTHSSB | 8 | 14 | PG | N | S | B | 1 |
|---------------------|--------|---|-----|--------|---|----|----|---|---|---|---|
| PRODUCT SERIES      | NEM    | NEMESIS                                       |     |        |   |    |    |   |   |   |   |
| SUB SERIES          | QTHSSB | QUICK TERMINATION HIGH SPEED SNAPON BREAKAWAY |     |        |   |    |    |   |   |   |   |
| SHELL STYLE         | 6      | STANDARD CABLE PLUG                           |     |        |   |    |    |   |   |   |   |
|                     | 8      | DUAL COUPLING PLUG                            |     |        |   |    |    |   |   |   |   |
| CONTACT ARRANGEMENT | 14     | 7*, 8, 14, 19                                 |     |        |   |    |    |   |   |   |   |
| CONTACT TYPE        | PG     | POGO PIN, SPRING PROBE CONTACT                |     |        |   |    |    |   |   |   |   |
| CLOCKING            | N      | COLOR MARK BLUE                               |     |        |   |    |    |   |   |   |   |
|                     | A      | COLOR MARK RED                                |     |        |   |    |    |   |   |   |   |
|                     | B      | COLOR MARK GREEN                              |     |        |   |    |    |   |   |   |   |
|                     | C      | COLOR MARK GREY                               |     |        |   |    |    |   |   |   |   |
|                     | D      | COLOR MARK YELLOW                             |     |        |   |    |    |   |   |   |   |
| TERMINATION TYPE    | S      | SOLDER CUP (22 AWG MAX)                       |     |        |   |    |    |   |   |   |   |
| HARDWARE FINISH     | B      | BLACK ELECTROLESS NICKEL                      |     |        |   |    |    |   |   |   |   |
|                     | N      | ELECTROLESS NICKEL                            |     |        |   |    |    |   |   |   |   |
| SEALING DEPTH       | BLANK  | 2M FOR 1 HOUR                                 |     |        |   |    |    |   |   |   |   |
|                     | 1      | 20M FOR 1 HOUR**                              |     |        |   |    |    |   |   |   |   |

\* 7 CONTACT PINS IS RATED FOR STANDARD SPEED  
 \*\* 20M FOR SHELL STYLE 8 ONLY



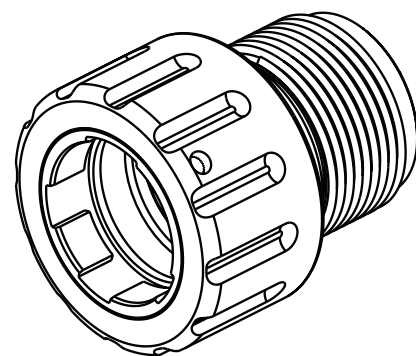
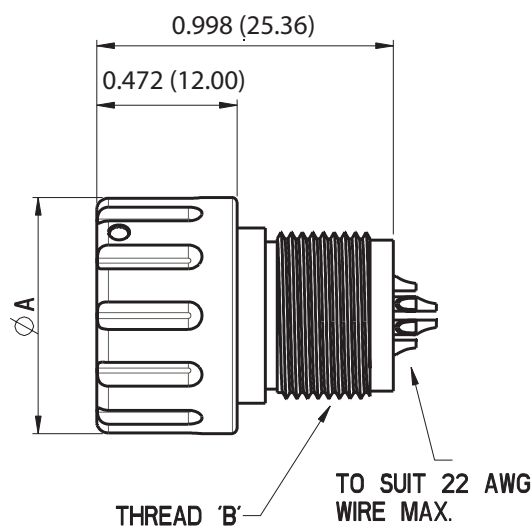
# Nemesis Plug Drawings- Standard and Dual Coupling

## Standard Plug



| Standard Plug |               |                 |
|---------------|---------------|-----------------|
| Shell Size    | A             | Thread B        |
| 7/8           | 0.590 (15.00) | 7/16-28 UNEF-2A |
| 14            | 0.699 (17.75) | 9/16-28 UN-2A   |
| 19            | 0.748 (19.00) | 5/8-28 UN-2A    |

## Dual Coupling Plug



| Dual Coupling Plug |               |                 |
|--------------------|---------------|-----------------|
| Shell Size         | A             | Thread B        |
| 7/8                | 0.687 (17.45) | 7/16-28 UNEF-2A |
| 14                 | 0.795 (20.20) | 9/16-28 UN-2A   |
| 19                 | 0.844 (21.45) | 5/8-28 UN-2A    |

Dimensions shown in inches (mm)  
Specifications and dimensions subject to change



# Nemesis Ordering Guide-

## In-line Receptacle



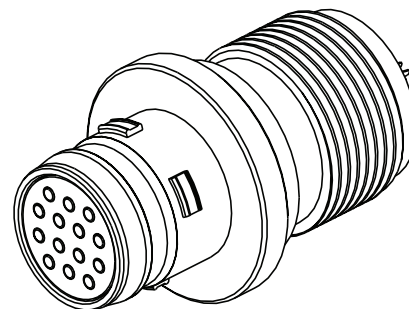
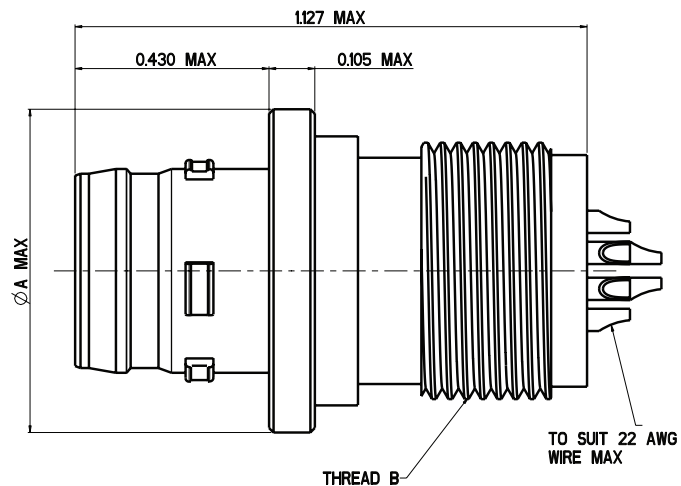
|                     |        |   | NEM | QTHSSB | 1 | 14 | PP | N | S | B | 2 |
|---------------------|--------|---|-----|--------|---|----|----|---|---|---|---|
| PRODUCT SERIES      | NEM    | NEMESIS                                       |     |        |   |    |    |   |   |   |   |
| SUB SERIES          | QTHSSB | QUICK TERMINATION HIGH SPEED SNAPON BREAKAWAY |     |        |   |    |    |   |   |   |   |
| SHELL STYLE         | 1      | IN-LINE RECEPTACLE                            |     |        |   |    |    |   |   |   |   |
| CONTACT ARRANGEMENT | 14     | 7*, 8, 14, 19                                 |     |        |   |    |    |   |   |   |   |
| CONTACT TYPE        | PP     | POGO PAD CONTACT                              |     |        |   |    |    |   |   |   |   |
| CLOCKING            | N      | COLOR MARK BLUE                               |     |        |   |    |    |   |   |   |   |
|                     | A      | COLOR MARK RED                                |     |        |   |    |    |   |   |   |   |
|                     | B      | COLOR MARK GREEN                              |     |        |   |    |    |   |   |   |   |
|                     | C      | COLOR MARK GREY                               |     |        |   |    |    |   |   |   |   |
|                     | D      | COLOR MARK YELLOW                             |     |        |   |    |    |   |   |   |   |
| TERMINATION TYPE    | S      | SOLDER CUP (22 AWG MAX)                       |     |        |   |    |    |   |   |   |   |
| HARDWARE FINISH     | B      | BLACK ELECTROLESS NICKEL                      |     |        |   |    |    |   |   |   |   |
|                     | N      | ELECTROLESS NICKEL                            |     |        |   |    |    |   |   |   |   |
| SEALING DEPTH       | 1      | 2M FOR 1 HOUR                                 |     |        |   |    |    |   |   |   |   |
|                     | 2      | 20M FOR 1 HOUR                                |     |        |   |    |    |   |   |   |   |

\* 7 CONTACT PINS IS RATED FOR STANDARD SPEED



# Nemesis In-line Receptacle

## Nemesis In-line Receptacle



| Nemesis In-line Receptacle |                 |                 |
|----------------------------|-----------------|-----------------|
| Shell Size                 | $\varnothing A$ | Thread B        |
| 7/8                        | 0.595 (15.11)   | 7/16-28 UNEF-2A |
| 14                         | 0.713 (18.11)   | 9/16-28 UN-2A   |
| 19                         | 0.772 (19.61)   | 5/8-28 UN-2A    |

# Nemesis Ordering Guide- Jamnut Receptacle

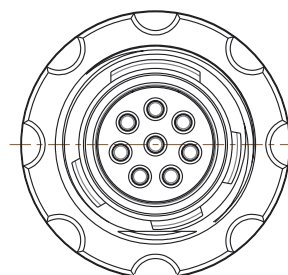
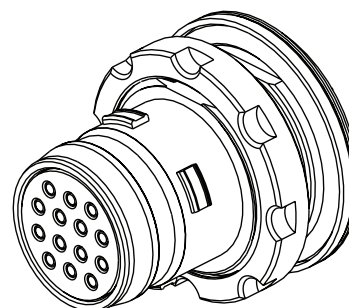
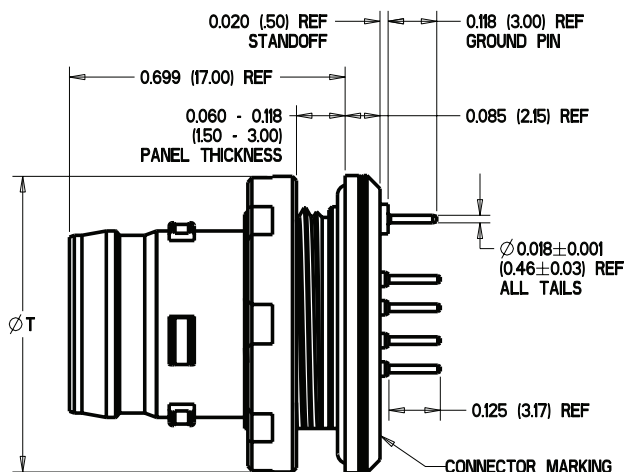


|                     |        |   | NEM | QTHSSB | 7 | 14 | PP | N | S | B | 2 | H |
|---------------------|--------|---|-----|--------|---|----|----|---|---|---|---|---|
| PRODUCT SERIES      | NEM    | NEMESIS                                       |     |        |   |    |    |   |   |   |   |   |
| SUB SERIES          | QTHSSB | QUICK TERMINATION HIGH SPEED SNAPON BREAKAWAY |     |        |   |    |    |   |   |   |   |   |
| SHELL STYLE         | 7      | JAMNUT RECEPTACLE                             |     |        |   |    |    |   |   |   |   |   |
| CONTACT ARRANGEMENT | 14     | 7*, 8, 14, 19                                 |     |        |   |    |    |   |   |   |   |   |
| CONTACT TYPE        | PP     | POGO PAD CONTACT                              |     |        |   |    |    |   |   |   |   |   |
| CLOCKING            | N      | COLOR MARK BLUE                               |     |        |   |    |    |   |   |   |   |   |
|                     | A      | COLOR MARK RED                                |     |        |   |    |    |   |   |   |   |   |
|                     | B      | COLOR MARK GREEN                              |     |        |   |    |    |   |   |   |   |   |
|                     | C      | COLOR MARK GREY                               |     |        |   |    |    |   |   |   |   |   |
|                     | D      | COLOR MARK YELLOW                             |     |        |   |    |    |   |   |   |   |   |
| TERMINATION TYPE    | S      | SOLDER CUP (22 AWG MAX)                       |     |        |   |    |    |   |   |   |   |   |
|                     | T      | PCB TAIL                                      |     |        |   |    |    |   |   |   |   |   |
| HARDWARE FINISH     | B      | BLACK ELECTROLESS NICKEL                      |     |        |   |    |    |   |   |   |   |   |
|                     | N      | ELECTROLESS NICKEL                            |     |        |   |    |    |   |   |   |   |   |
| SEALING DEPTH       | BLANK  | 2M FOR 1 HOUR FLUOROSILICONE O-RING           |     |        |   |    |    |   |   |   |   |   |
|                     | 1      | 2M FOR 1 HOUR EMI O-RING                      |     |        |   |    |    |   |   |   |   |   |
|                     | 2      | 20M FOR 1 HOUR FLUOROSILICONE O-RING          |     |        |   |    |    |   |   |   |   |   |
| ACCESSORIES         | H      | HEX JAMNUT                                    |     |        |   |    |    |   |   |   |   |   |
|                     | T      | TAMPERPROOF JAMNUT                            |     |        |   |    |    |   |   |   |   |   |

\* 7 CONTACT PINS IS RATED FOR STANDARD SPEED

# Nemesis Jamnut Receptacle

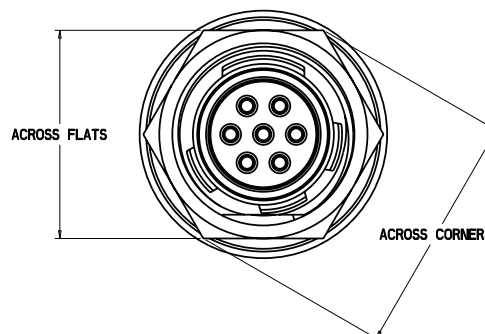
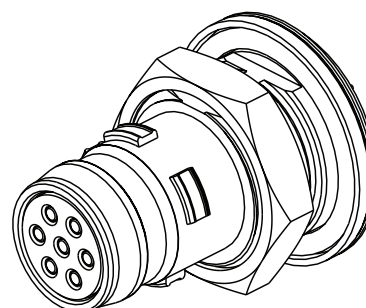
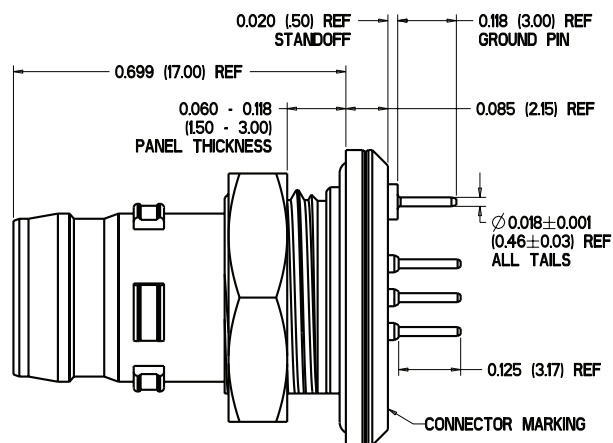
## Tamper Proof Jamnut



**Tamperproof Jamnut**

| Shell Size | $\varnothing T$ |
|------------|-----------------|
| 7/8        | 0.590 (15)      |
| 14         | 0.701 (18)      |
| 19         | 0.748 (19)      |

## Hex Jamnut

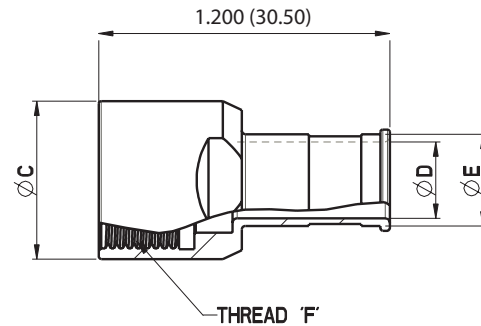


**Hex Jamnut**

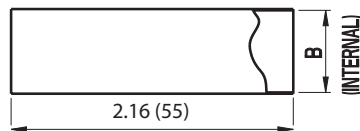
| Shell Size | Across Flats  | Across Corners |
|------------|---------------|----------------|
| 7/8        | 0.500 (12.70) | 0.577 (14.66)  |
| 14         | 0.625 (15.88) | 0.722 (18.34)  |
| 19         | 0.687 (17.45) | 0.793 (20.16)  |

# Nemesis Accessories

## Backshell

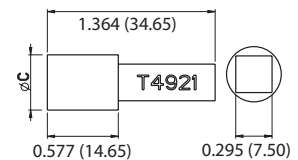
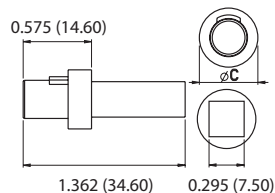


| Nemesis Backshells |                         |            |               |               |               |                |                  |
|--------------------|-------------------------|------------|---------------|---------------|---------------|----------------|------------------|
| Part Number        | Descriptive Part Number | Shell Size | ØC            | ØD            | ØE            | THREAD F       | Weight (grammes) |
| 448-7873-001       | NEM-BS-71N              | 7/8        | 0.528 (13.40) | 0.236 (6.00)  | 0.299 (7.60)  | 7/16-28UNEF-2B | 9.64             |
| 448-7873-002       | NEM-BS-72N              | 7/8        | 0.528 (13.40) | 0.264 (6.70)  | 0.327 (8.30)  | 7/16-28UNEF-2B | 9.80             |
| 448-7873-003       | NEM-BS-73N              | 7/8        | 0.528 (13.40) | 0.291 (7.40)  | 0.354 (9.00)  | 7/16-28UNEF-2B | 9.95             |
| 448-7873-010       | NEM-BS-1410N            | 14         | 0.652 (16.55) | 0.264 (6.70)  | 0.327 (8.30)  | 9/16-28UN-2B   |                  |
| 448-7873-004       | NEM-BS-144N             | 14         | 0.652 (16.55) | 0.315 (8.00)  | 0.378 (9.60)  | 9/16-28UN-2B   | 11.85            |
| 448-7873-005       | NEM-BS-145N             | 14         | 0.652 (16.55) | 0.354 (9.00)  | 0.417 (10.60) | 9/16-28UN-2B   | 12.03            |
| 448-7873-006       | NEM-BS-146N             | 14         | 0.652 (16.55) | 0.394 (10.00) | 0.457 (11.60) | 9/16-28UN-2B   | 12.93            |
| 448-7873-011       | NEM-BS-1411N            | 14         | 0.652 (16.55) | 0.413 (10.50) | 0.476 (12.10) | 9/16-28UN-2B   |                  |
| 448-7873-007       | NEM-BS-197N             | 19         | 0.717 (18.20) | 0.364 (9.25)  | 0.427 (10.85) | 5/8-28UN-2B    | 13.87            |
| 448-7873-008       | NEM-BS-198N             | 19         | 0.717 (18.20) | 0.404 (10.25) | 0.467 (11.85) | 5/8-28UN-2B    | 14.05            |
| 448-7873-009       | NEM-BS-199N             | 19         | 0.717 (18.20) | 0.443 (11.25) | 0.506 (12.85) | 5/8-28UN-2B    | 14.22            |



| Heat Shrink Boot Dimension |            |           |
|----------------------------|------------|-----------|
| Part Number                | Shell Size | B         |
| 252-7689-000               | 7 / 8      | 0.63 (16) |
| 252-7689-001               | 14 / 19    | 0.94 (24) |

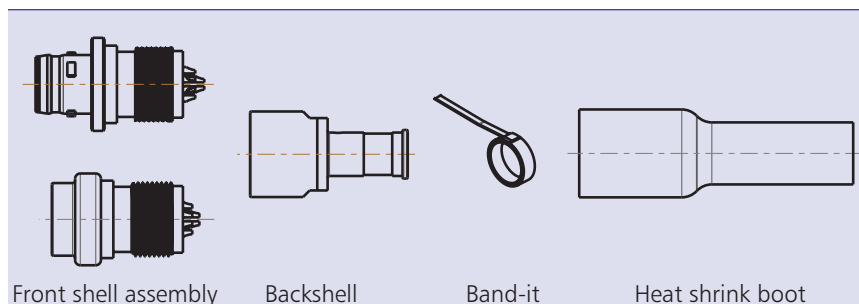
| Cable Ties & Tool |                    |               |
|-------------------|--------------------|---------------|
| Part Number       | Description        | Shell Size    |
| 995-0002-299      | 1/8 Cable Tie Band | 7, 8, 14 & 19 |
| 995-0002-298      | Hand Banding Tool  | 7, 8, 14 & 19 |



| Plug Cable Support Tool |            |               |
|-------------------------|------------|---------------|
| Part Number             | Shell Size | ØC            |
| T4918                   | 7 / 8      | 0.492 (12.50) |
| T4919                   | 14         | 0.610 (15.50) |
| T4920                   | 19         | 0.650 (16.50) |

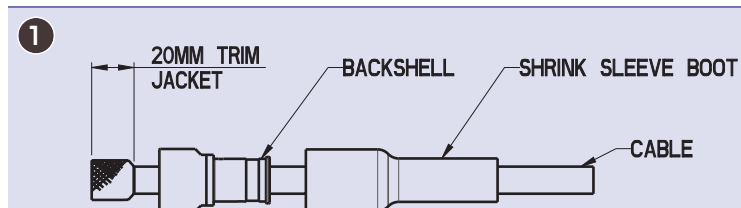
| Receptacle Cable Support Tool |            |               |
|-------------------------------|------------|---------------|
| Part Number                   | Shell Size | ØC            |
| T4921                         | 7 / 8      | 0.445 (11.30) |
| T4922                         | 14         | 0.553 (14.05) |
| T4923                         | 19         | 0.630 (16.00) |

# Nemesis Assembly Instructions

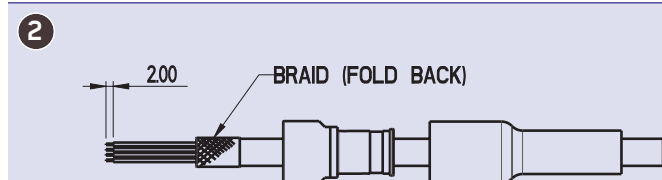


## Tooling required :

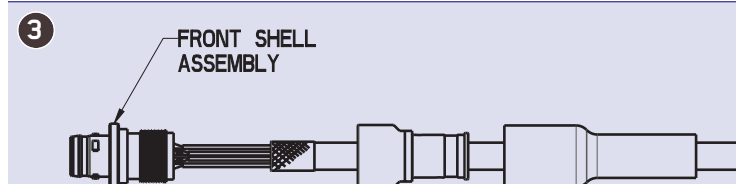
- 1) Band-it tool - tie-dex 2
- 2) Front shell support tool :-  
 T4918 - 7 way plug T4921 - 7 way receptacle  
 T4919 - 14 way plug T4922 - 14 way receptacle  
 T4920 - 19 way plug T4923 - 19 way receptacle



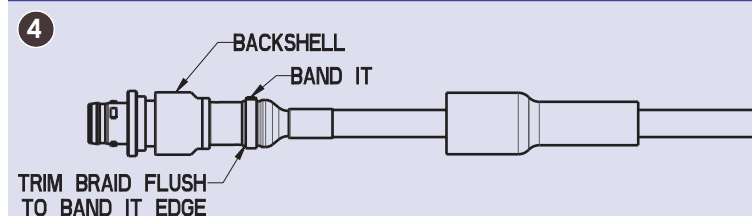
Slide boot and backshell onto cable (these can be put on later if building a pigtail assembly). Trim outer jacket back to dimension shown, exposing braid, being careful not to nick or damage it.



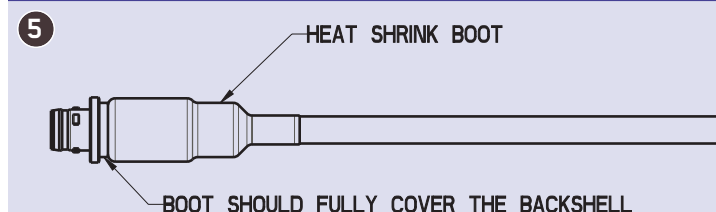
Fold the braid back over the jacket, this can be taped back in position whilst carrying out the wire termination. Trim back the wire insulation to the dimension shown, if a stranded center conductor, ensure the twist is tight and tin dip the wire ends in preparation for soldering to contacts.



Fit the appropriate support tool to a vice and plug on front shell assembly. Offer up the wires, one at a time, to the required contact and solder to position.



Slide the backshell over the wires and screw onto the front shell to a torque of 30 / 35 lb. ins. (3.40 / 3.95nm). Flare the braid over the tube of the backshell. If the cable has a strain relief, this should be wrapped and secured under the Band-it. Load the Band-it to the tool, note - the Band-it should be wrapped twice, locate the Band-it over the braid (there is a u'cut on the tube to indicate the position of the Band-it) and operate the tool to secure the Band-it around the braid. Trim the braid and strain relief (if fitted) approx. flush with the edge of the Band-it.



Slide the boot fully over the backshell and apply heat to shrink in position.

# Cables and Overmolding

## Value-Added Cabling Solutions from ITT Cannon

Let ITT Cannon complete your solution with our custom cable products. A complement to the reduction in size of the connectors is the reduction in weight and thickness in cabling. Choose from several available options to help customize your application. Improving on our high reliability connectors, we offer overmolds that are suitable for military requirements in harsh environments.



### Braiding

- EMI shielded metal to light weight, textile braiding for abrasion protection

### Overmolding

- Injection molding with poly ureaurethane, Santoprene, and polyimide
- Transfer molding with Cannon's Super Jacketing System (SJS Series), Viton, Neoprene, EPDM, and alternative molding compounds
- Low pressure and prototype molding including M24041, poly ureaurethane, Polyimide, and custom compounds

### Shrink Boots

- Customized solution for all connector-to-cable transition type including straight, 90 and 45 degree.



### Backshells

- Integration of commercial and MIL-Spec backshell or molding adapters

### Cable Jacket

- Blown on for multi leg or short run in SJS jacket, Viton Neoprene, EPDM, and various other tubing jackets
- Extruded jackets for high runner cables and long lengths SJS jacket, poly u, Santoprene, Neoprene, EPDM and various other types. NOTE RONDENT PROOF
- Textile braids and heat shrinks

### Integrated Assembly

- Integrated Connectors into your Box/Unit.
- Cable/Wire harnesses in boxes or as an LRU (Note NO splice micro cables)
- Machined & high volume Die Cast housings that save time and money when connectors are part of the housing.



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## Connect with the experts

ITT's Cannon brand is a world leader in the design and manufacture of highly engineered connector solutions for multiple end markets.



### Why ITT

ITT is a focused multi-industrial company that designs and manufactures highly engineered critical components and customized technology solutions. ITT's Cannon brand is a leading global manufacturer of connector products serving international customers in aerospace, defense, medical, industrial and transportation end markets. ITT's Connector business, which also includes the Veam and BIW Connector Systems brand, manufactures and supplies a variety of connectors and interconnects that make it possible to transfer data, signal and power in an increasingly connected world.

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