



DeviceNet Physical Media

Cutler-Hammer DeviceNet physical media products are used to link I/O devices — such as sensors, solenoids, starters and drives — to the controlling PC or PLC. Both intelligent and non-intelligent devices can be linked to the network. Physical media provide network power transmission as well as the communication medium, while ensuring the integrity of the bus system.

A Complete Product Line

Cutler-Hammer DeviceNet Physical Media comprises a complete product family including multiport connections, molded cables, tapping tees, and control panel receptacles to meet the requirements of any control system.

- Sealed and rated NEMA 1, 3, 4, 6, 13 and IP67 for harsh environment installations.
- Trunkline and dropline system includes configurations with mini and micro quickchange connectors for fast network setup and increased flexibility.
- Mini-connector products and bulk cable are UL listed at 600V AWM.
- System handles standard and intelligent devices on the same network.

Cable assembly products carry the 24V DC network power to the I/O devices as well as providing the communication medium for your Cutler-Hammer DeviceNet system.

- Sealed to meet IP67 and NEMA 1, 3, 4, 6 and 13 requirements, allowing your DeviceNet system to operate in a variety of tough environments.
- Designed to maintain low mating force and high average separation force to ensure the integrity of your network and provide for increased reliability.
- Constructed of materials to provide long term corrosion and contact resistance for superior environmental performance.

Specifications

Mechanical

- Insert Material Polyurethane
- Molded Body Material. Polyurethane
- Contact Material Gold-Plated Brass
- Contact Plating. Gold — 0.2µm, Nickel — 2µm
- Coupling Nut Material. Nickel-Plated Brass
- Cable Type(s):
 - DeviceNet Trunk. PVC, 2 Shielded Pairs (15 AWG Power, 18 AWG Data) w/18 AWG Copper Drain
 - DeviceNet Drop PVC, 2 Shielded Pairs (22 AWG Power, 22 AWG Data) w/22 AWG Copper Drain
- Cable Diameters:
 - DeviceNet Trunk. 0.433"
 - DeviceNet Drop 0.285"

Electrical

- Voltage Rating:
 - Micro-Connector Assemblies . . . 300V UL CMG, 300V CSA AWM
 - Mini-Connector Assemblies . . . 300V UL CMG, 300V CSA AWM, 600V UL AWM
- Current Rating:
 - DeviceNet Trunk. 17.6A
 - DeviceNet Drop 7.2A
- Contact Resistance ≤5 mΩ (After 100 Mate/Unmate Cycles — Per MIL. STD. 1344, 3004.1)
- Isolation Resistance. ≥10⁹ Ω

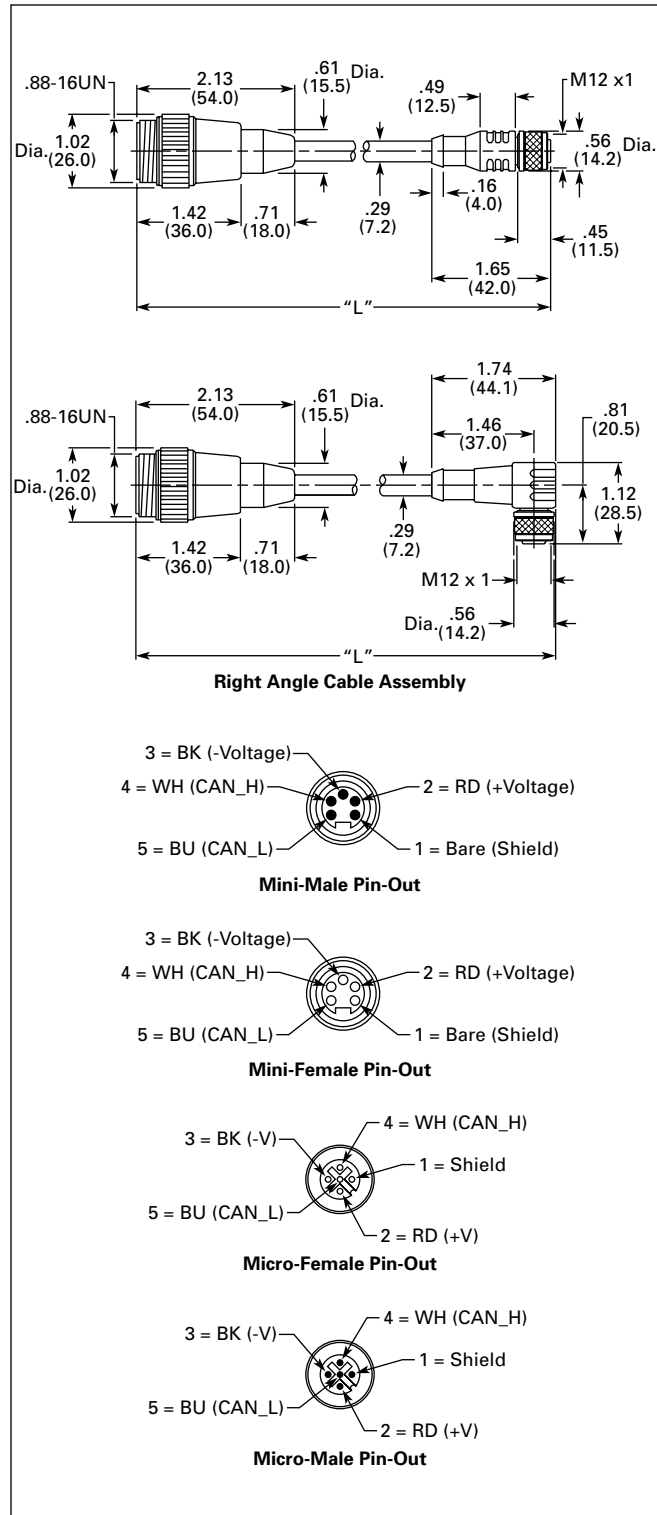
Environmental

- Protection IP67, NEMA 1, 3, 4, 6, 13
- Ambient Operating Temperature. -40° to +80°C

Certifications

- UL UL Recognized, File No. E90625
- CSA. CSA Certified, File No. LR102502-1
- VDE. Spacings to VDE 0110 Group C (250V AC/300V DC)

Dimensional Information in Inches (mm)



Ordering Information

Cable	Catalog Number
20' Mini Male to Micro Female Drop Cable	D970DNDMR20
12' Mini Male to Micro Female Drop Cable	D970DNDMR12
6' Mini Male to Micro Female Drop Cable	D970DNDMR06
3' Mini Male to Micro Female Drop Cable	D970DNDMR03
1' Mini Male to Micro Female Drop Cable	D970DNDMR01
20' Mini Male to Mini Female Drop Cable	D970DNDMM20
12' Mini Male to Mini Female Drop Cable	D970DNDMM12
6' Mini Male to Mini Female Drop Cable	D970DNDMM06
3' Mini Male to Mini Female Drop Cable	D970DNDMM03
1' Mini Male to Mini Female Drop Cable	D970DNDMM01
20' Mini Male to Right Angle Mini Female Drop Cable	D970DNDMM20E
12' Mini Male to Right Angle Mini Female Drop Cable	D970DNDMM12E
6' Mini Male to Right Angle Mini Female Drop Cable	D970DNDMM06E
3' Mini Male to Right Angle Mini Female Drop Cable	D970DNDMM03E
1' Mini Male to Right Angle Mini Female Drop Cable	D970DNDMM01E
20' Mini Male to Right Angle Micro Female Drop Cable	D970DNDMR20E
12' Mini Male to Right Angle Micro Female Drop Cable	D970DNDMR12E
6' Mini Male to Right Angle Micro Female Drop Cable	D970DNDMR06E
3' Mini Male to Right Angle Micro Female Drop Cable	D970DNDMR03E
1' Mini Male to Right Angle Micro Female Drop Cable	D970DNDMR01E
20' Mini Male to Open Drop Cable	D970DNDMP20
12' Mini Male to Open Drop Cable	D970DNDMP12
6' Mini Male to Open Drop Cable	D970DNDMP06
3' Mini Male to Open Drop Cable	D970DNDMP03
20' Micro Male to Micro Female Drop Cable	D970DNDRR20
12' Micro Male to Micro Female Drop Cable	D970DNDRR12
6' Micro Male to Micro Female Drop Cable	D970DNDRR06
3' Micro Male to Micro Female Drop Cable	D970DNDRR03
1' Micro Male to Micro Female Drop Cable	D970DNDRR01
20' Micro Male to Mini Female Drop Cable	D970DNDRM20
12' Micro Male to Mini Female Drop Cable	D970DNDRM12
6' Micro Male to Mini Female Drop Cable	D970DNDRM06
3' Micro Male to Mini Female Drop Cable	D970DNDRM03
1' Micro Male to Mini Female Drop Cable	D970DNDRM01
20' Micro Male to Right Angle Micro Female Drop Cable	D970DNDRR20E
12' Micro Male to Right Angle Micro Female Drop Cable	D970DNDRR12E
6' Micro Male to Right Angle Micro Female Drop Cable	D970DNDRR06E
3' Micro Male to Right Angle Micro Female Drop Cable	D970DNDRR03E
1' Micro Male to Right Angle Micro Female Drop Cable	D970DNDRR01E
20' Micro Male to Open Drop Cable	D970DNDRP20
6' Micro Male to Open Drop Cable	D970DNDRP06
3' Micro Male to Open Drop Cable	D970DNDRP03
50' Mini Male to Mini Female Trunk Cable	D970DNKMM50
45' Mini Male to Mini Female Trunk Cable	D970DNKMM45
40' Mini Male to Mini Female Trunk Cable	D970DNKMM40
35' Mini Male to Mini Female Trunk Cable	D970DNKMM35
30' Mini Male to Mini Female Trunk Cable	D970DNKMM30
25' Mini Male to Mini Female Trunk Cable	D970DNKMM25
20' Mini Male to Mini Female Trunk Cable	D970DNKMM20
12' Mini Male to Mini Female Trunk Cable	D970DNKMM12
10' Mini Male to Mini Female Trunk Cable	D970DNKMM10
6' Mini Male to Mini Female Trunk Cable	D970DNKMM06
5' Mini Male to Mini Female Trunk Cable	D970DNKMM05
3' Mini Male to Mini Female Trunk Cable	D970DNKMM03
1' Mini Male to Mini Female Trunk Cable	D970DNKMM01

Bulk cable is available for use with the field-attachable connectors to facilitate custom cabling solutions.

Specifications — Bulk Cable

- **Insulation Material:**
 - Data Pair Foamed PE
 - Power Pair PVC with Nylon Skin
- **Jacket Material (Color)** PVC (Lt. Gray)
- **Type Shield and % Coverage:**
 - Individual Poly/Aum – 100%
 - Overall TC Braid – 65%
- **Twisted Pair Lay Length:**
 - Trunk 4" (3 Twists/Ft.)
 - Drop 2.5" (4.8 Twists/Ft.)
- **Maximum Pulling Tension:**
 - Trunk 190 Lbs.
 - Drop 65 Lbs.
- **Cable Diameters:**
 - Trunk 0.475"
 - Drop 0.274"
- **Minimum Bend Radius:**
 - Trunk 4.8"
 - Drop 2.8"

Electrical

- **Voltage Rating:**
 - Trunk 300 UL CMG, PLTC
300V CSA AWM
600V UL AWM
 - Drop 150V UL CL2, CMG
600V CSA AWM
600V UL AWM

Mechanical

- **Cable Types:**
 - DeviceNet Trunk 2 Shield Pairs (15 AWG Power, 18 AWG Data) with 18 AWG Copper Drain
 - DeviceNet Drop 2 Shield Pairs (22 AWG Power, 24 AWG Data) with 22 AWG Copper Drain

Environmental

- **Ambient Operating Temperature.** -25° to +80°C

Certifications

- **UL.** UL Recognized, File No. E34972, E12683 and E108998
- **CSA.** CSA Certified, File No. C22.2 Nos. 210

Ordering Information

Cable	Catalog Number
Bulk Cable: 1000' Trunk	D970DNBK1000
Bulk Cable: 1000' Drop	D970DNBD1000
Bulk Cable: 500' Trunk	D970DNBK0500
Bulk Cable: 500' Drop	D970DNBD0500
Bulk Cable: 250' Trunk	D970DNBK0250
Bulk Cable: 250' Drop	D970DNBD0250

A variety of I/O devices can be attached to the Cutler-Hammer DeviceNet network through the use of tee connectors and control panel receptacles. Network access tees are also available to provide a readily accessible location to "tap" into the network to perform troubleshooting and verification.

Specifications

Mechanical

- Insert Material Polyurethane
- Molded Body Material Polyurethane
- Contact Material Gold-Plated Brass
- Contact Plating Gold — 0.2µm
Nickel — 2µm
- Coupling Nut Material Nickel-Plated Brass

Electrical

- Voltage Rating:
 - Micro-Connector Assemblies .. 300V UL CMG,
300V CSA AWM
 - Mini-Connector Assemblies ... 300V UL CMG,
300V CSA AWM,
600V UL AWM
- Current Rating 17.6A
- Contact Resistance ≤5 mΩ (After 100
Mate/Unmate
Cycles — Per MIL.
STD. 1344, 3004.1)
- Isolation Resistance ≥10⁹ Ω

Environmental

- Protection NEMA 1, 3, 4, 6, 13
and IEC IP67
- Ambient Operating
Temperature -40° to +80°C

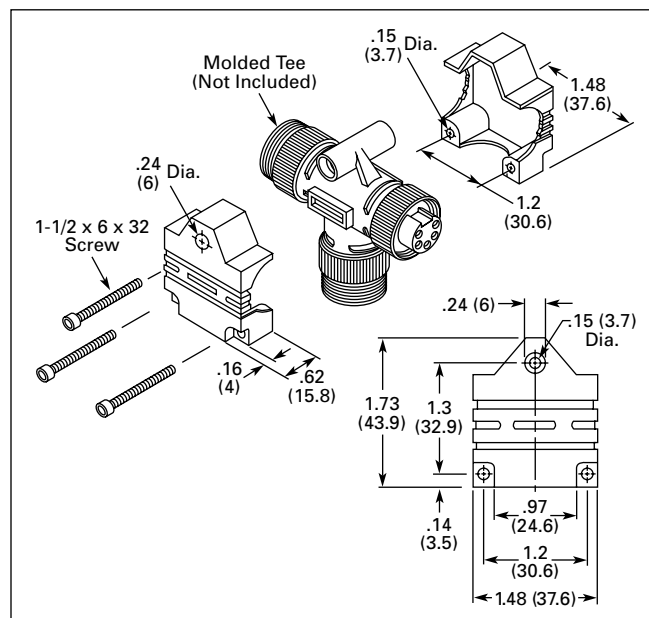
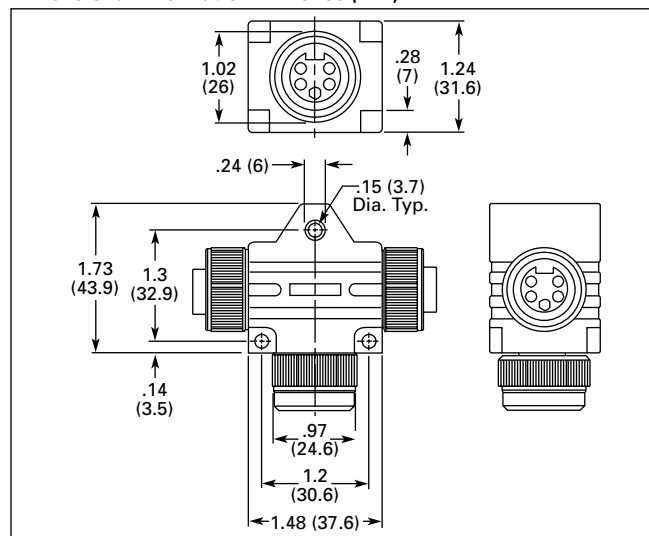
Certifications

- UL UL Listed,
File No. E90625
- CSA CSA Certified,
File No. LR102502-1
- VDE Spacings to VDE
0110 Group C
(250V AC/300V DC)

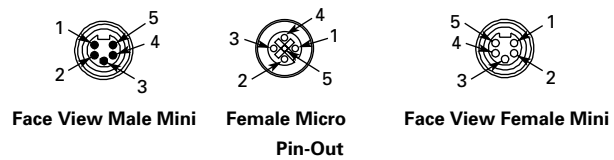
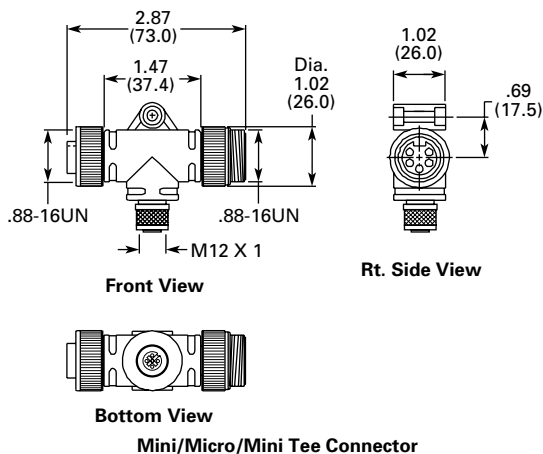
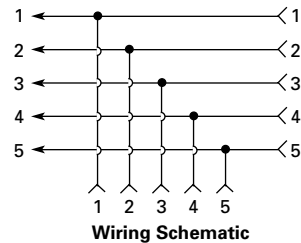
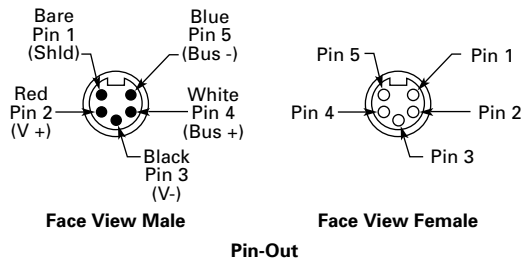
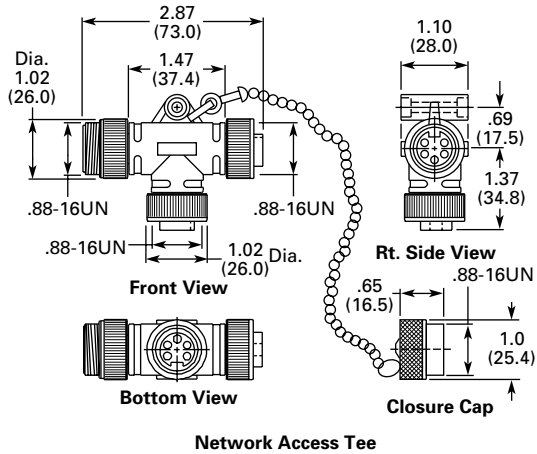
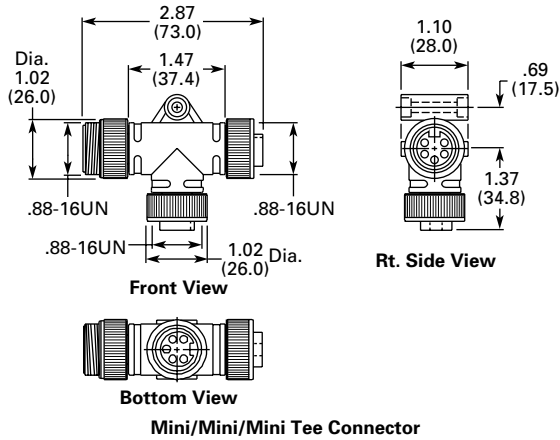
Tee Mounting Bracket Kit

Unique two-piece design readily fits around existing tee to provide three additional mounting holes. Fits Mini/Mini/Mini and Mini/Micro/Mini tees.

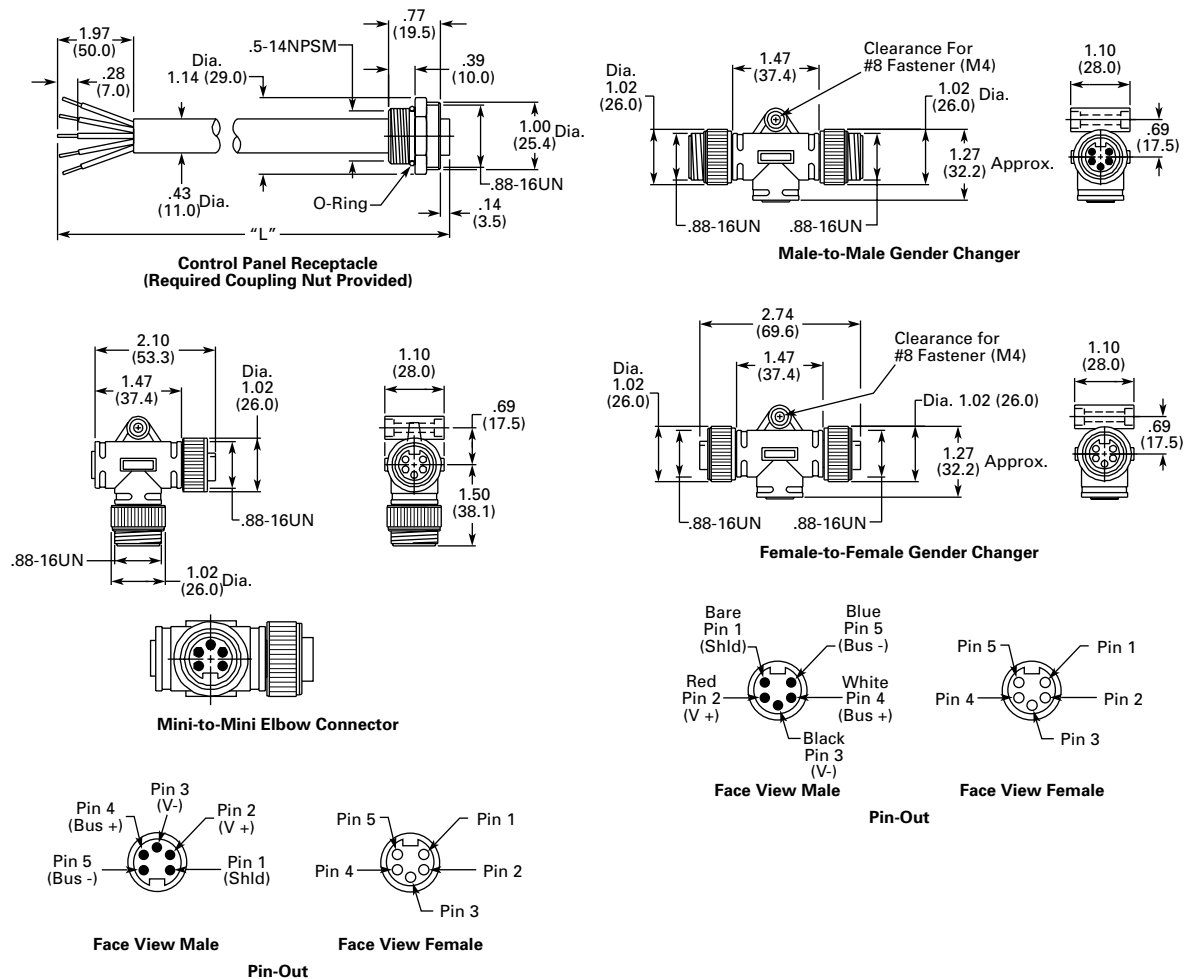
Dimensional Information in Inches (mm)



Dimensional Information in Inches (mm)

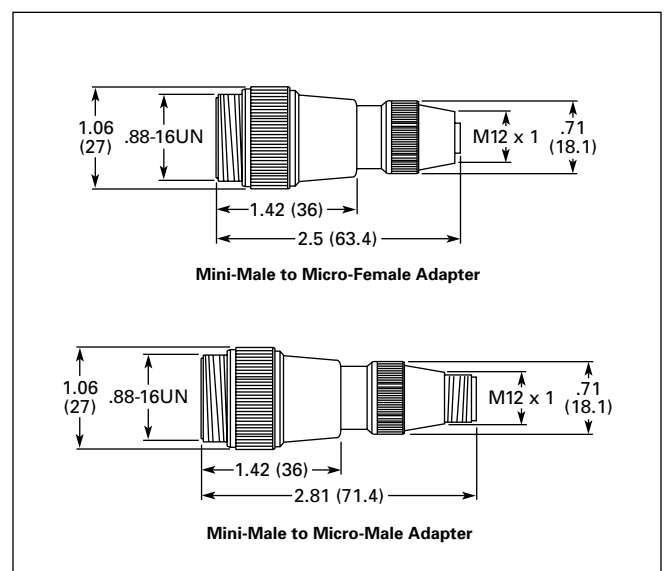


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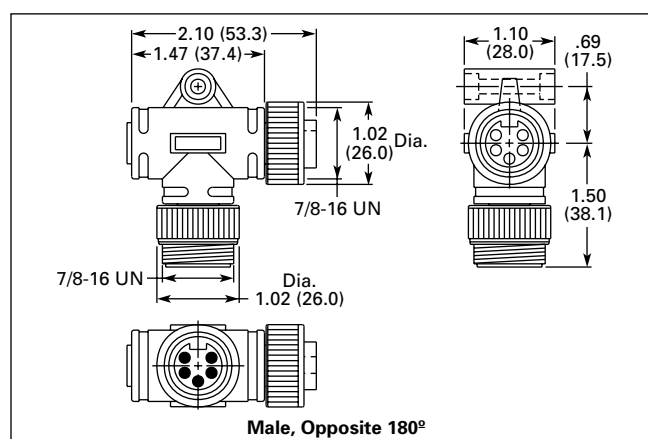
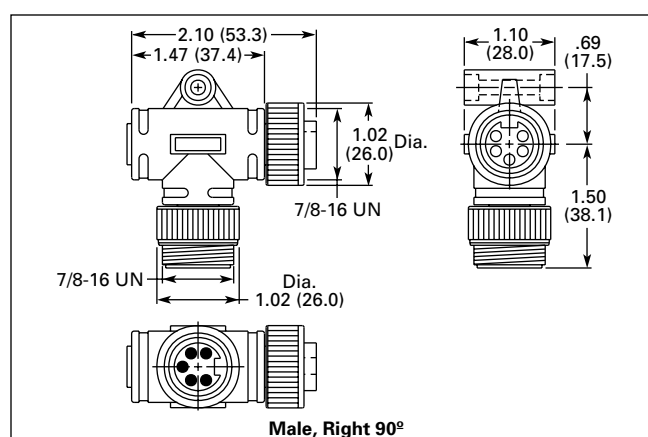
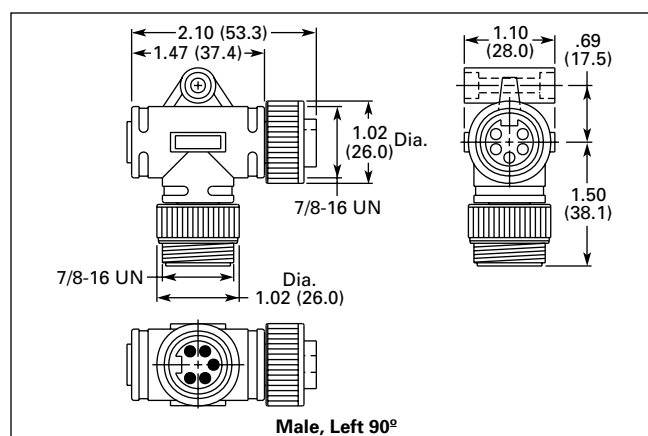
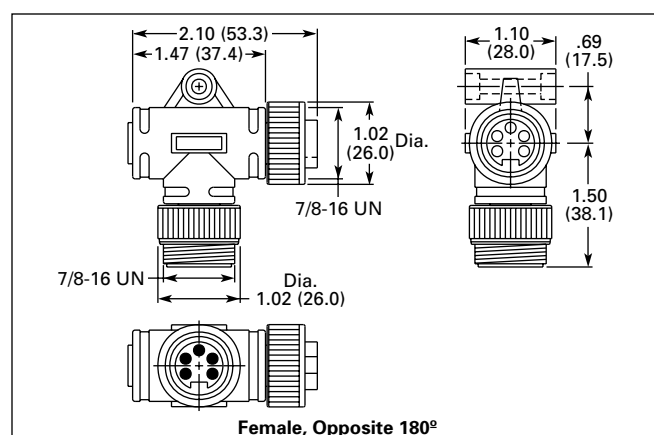
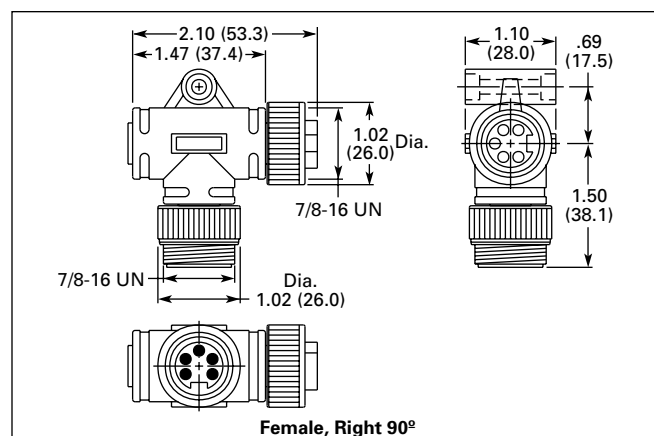
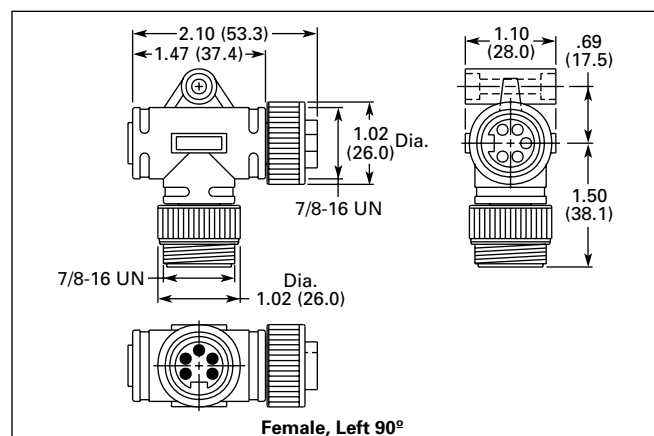
Ordering Information

Description	Catalog Number
Mini/Mini/Mini Tee Connector	D970DNTMM
Mini/Micro/Mini Tee Connector	D970DNTMR
Mini to Mini Elbow Connector	D970DNEMM
Network Access Tee	D970DNHMM
Trunk Cable Control Panel Bulk Head Connector — Female xx = 01 for 1' Length, xx = 03 for 3' Length, xx = 05 for 5' Length	D970DNFMxx
Trunk Cable Control Panel Bulk Head Connector — Male xx = 01 for 1' Length, xx = 03 for 3' Length, xx = 05 for 5' Length	D970DNFMxxA
Drop Cable Control Panel Bulk Head Connector — Female xx = 01 for 1' Length, xx = 03 for 3' Length, xx = 05 for 5' Length	D970DNFMxxD
Drop Cable Control Panel Bulk Head Connector — Male xx = 01 for 1' Length, xx = 03 for 3' Length, xx = 05 for 5' Length	D970DNFMxxAD
Mini-Male to Mini-Male Gender Changer	D970DNGMM
Mini-Female to Mini-Female Gender Changer	D970DNGMF
Mini-Male to Micro-Female Adapter	D970DNCMRF
Mini-Male to Micro-Male Adapter	D970DNCMRM



Keyway Converters

Provides rotation of key location on connector to solve a variety of installation challenges.



Ordering Information

Description	Catalog Number
Mini Keyway Converter, Female Left 90°	D970DNYMFL
Mini Keyway Converter, Female Right 90°	D970DNYMFR
Mini Keyway Converter, Female Opposite 180°	D970DNYMFO
Mini Keyway Converter, Male Left 90°	D970DNYMML
Mini Keyway Converter, Male Right 90°	D970DNYMMR
Mini Keyway Converter, Male Opposite 180°	D970DNYMMO

Field-attachable connectors are available for use with bulk cable to facilitate custom cabling solutions. The connectors are color-coded for ease of installation and to prevent costly wiring errors.

Specifications — Mini-Connector

Mechanical

- Insert Material Polyurethane
- Contact Body PA 6.6 GV
- Connector Body PA 6.6 GV
- Locking Nut AlMg₃
- Male Contact CuZn
- Screw Steel
- O-Ring Viton
- Insertion Force/Contact ^① ≤3 N
- Withdrawal Force/Contact ^① ≥1 N
- Mode of Connection Screw Clamps
- Wire Section max. AWG 15
or AWG 16 with
multicore cable end
- Good Chemical and Oil Resistance

Electrical

- Nominal Power 3 pol. = 12A
5 pol. = 9A
- Nominal Voltage 250V AC/600V DC
- Test Voltage 3 pol. = 2.5 KV_{eff}/60s
5 pol. = 1.5KV_{eff}/60s
- Insulation Resistance >10⁹ Ω
- Air and Creep Distance ≥4 mm acc. to
VDE 0110

Environmental

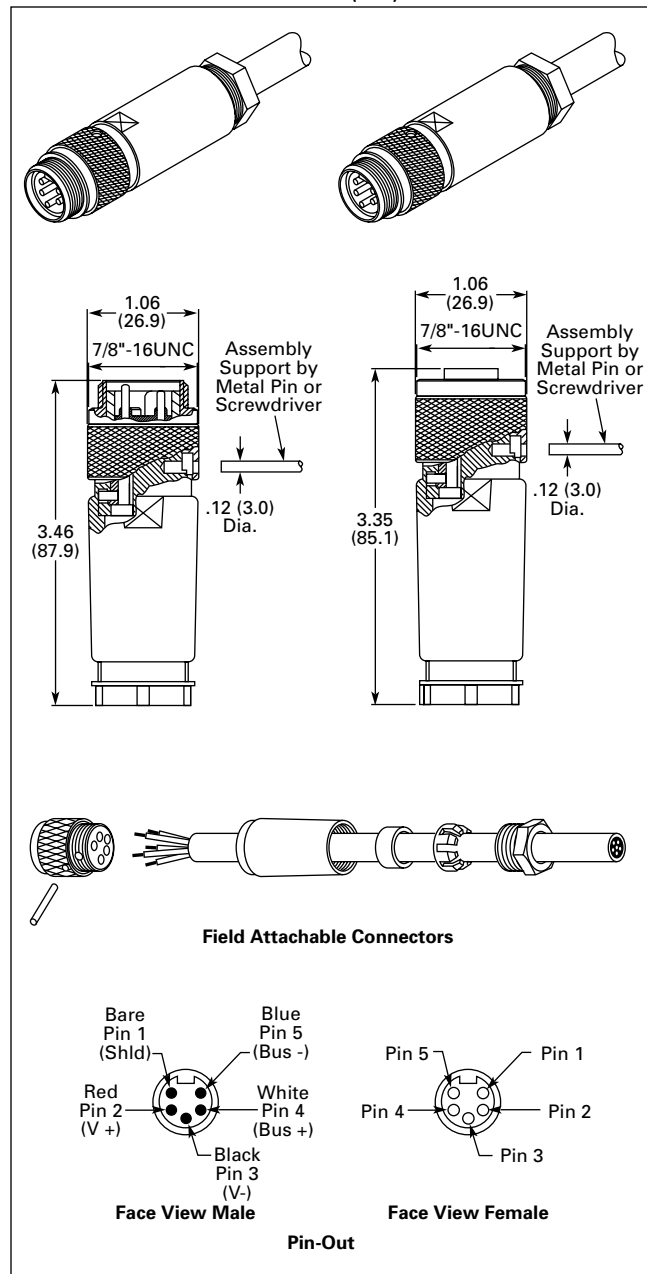
- Protection IEC IP67
- Ambient Operating
Temperature -40° to +85°C

Certifications

- UL UL Listed,
File No. E104696

^① Measured with a polished steel pin, nominal 1.98 mm.

Dimensional Information in Inches (mm) — Mini-Connector



Ordering Information

Description	Catalog Number
Male Attachable Drop Cable Mini-Connector	D970DNDFMA
Female Attachable Drop Cable Mini-Connector	D970DNDFMB
Male Attachable Trunk Cable Mini-Connector	D970DNKFMA
Female Attachable Trunk Cable Mini-Connector	D970DNKFMB

Specifications — Micro-Connector

Mechanical

- Insert Material Nylon
- Body Material Nylon
- Contact Material Brass
- Contact Plating Gold — 5μ in. (min.) over Palladium/Nickel — 20μ in. (min.)
- Coupling Nut Material. . . . Brass/Nickel Plate
- Grommet Material. Neoprene
- Maximum Wire Gauge . . . 18 AWG
- Cable Range. 0.16" – 0.32" (4.0 mm – 8.0 mm)

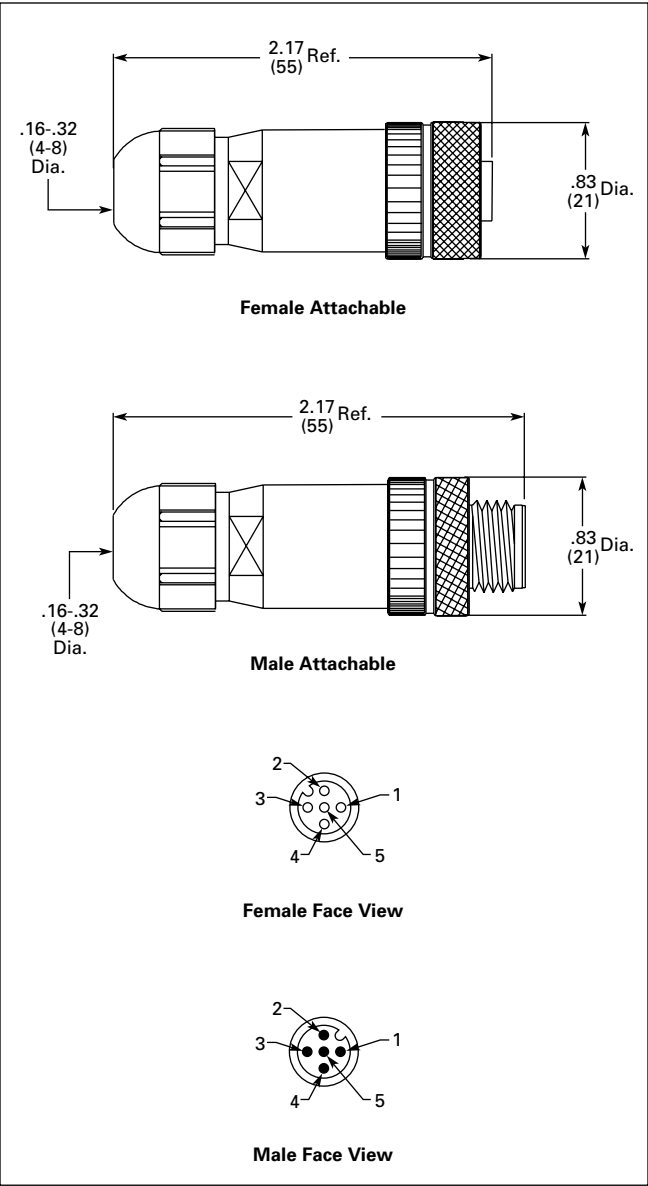
Electrical

- Voltage Rating 250V AC/300V DC
- Current Rating 4A
- Contact Resistance ≤5m Ω
- Insulation Resistance . . . ≥1000m Ω

Environmental

- Protection. IEC IP68
- Ambient Operating Temperature. -40° to +85°C

Dimensional Information in Inches (mm) — Micro-Connector



Ordering Information

Description	Catalog Number
Male Attachable Drop Cable Micro-Connector	D970DNDFRA
Female Attachable Drop Cable Micro-Connector	D970DNDFRB

Up to eight input devices can be attached to the Cutler-Hammer DeviceNet network through the use of a multi-tee device.

Specifications

Mechanical

- Insert Material Polyurethane
- Housing Material Die-cast Aluminum Alloy,
Polyester Urethane Powder
Coat Finish Black
- Contact Material Gold-Plated Brass
- Contact Plating Gold — 5μ In. (Min.)
Palladium/Nickel
— 20μ In. (Min.)
- Receptacle Nickel-Plated Brass

Electrical

- Operating Voltage Series/Parallel — 300V Max.
- Current Rating 8A Max.
- Contact Resistance ≤5 mΩ
(After 100 Mate/Unmate
Cycles — Per MIL. STD.
1344, 3004.1)
- Isolation Resistance ≥1000 mΩ

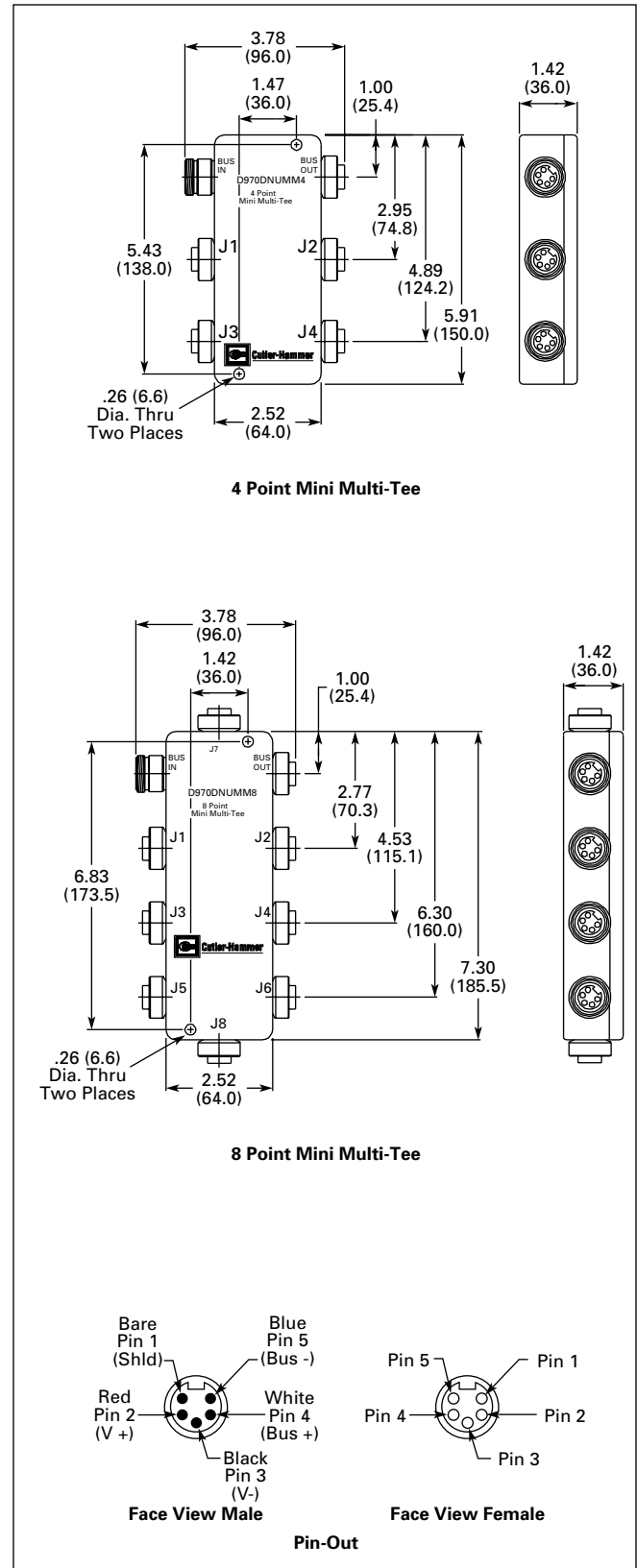
Environmental

- Protection NEMA 1, 3, 4, 6P and IEC IP67
- Ambient Operating
Temperature -40° to +90°C

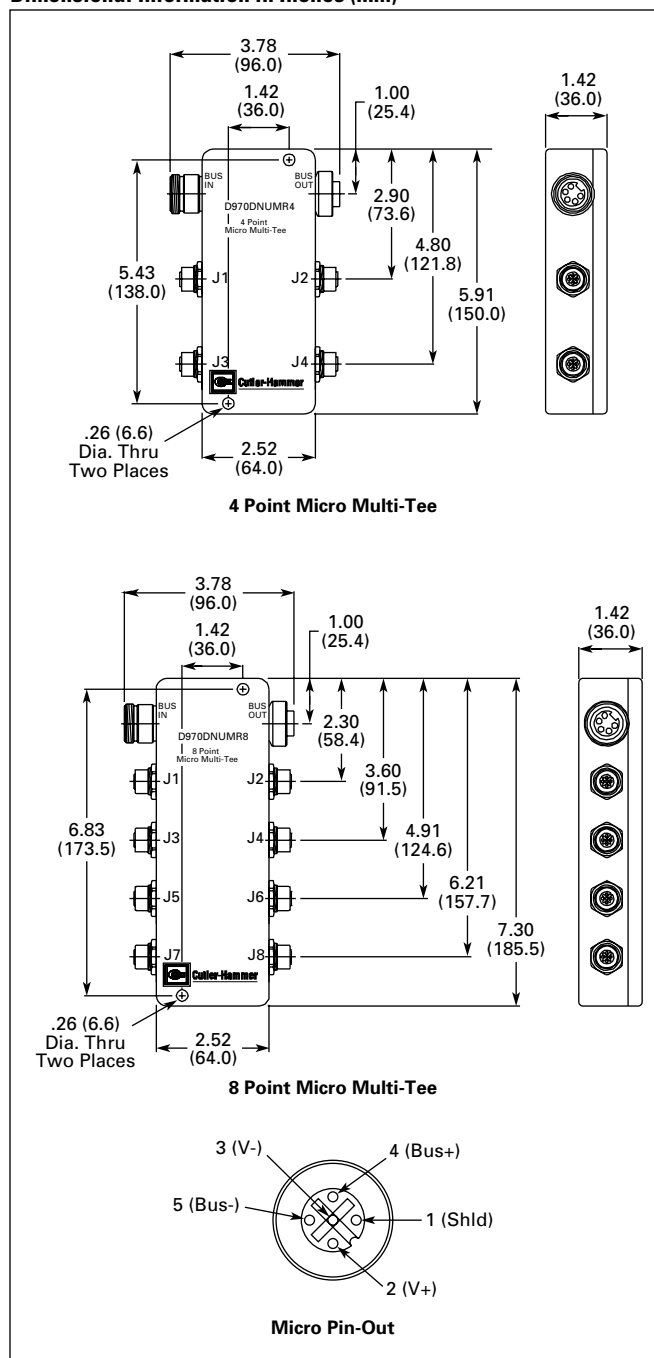
Certifications

- UL UL Listed, File No. E46237
- CSA CSA Certified, File No. LR6837
- VDE Spacings to VDE 0110
Group C (250V AC/300V DC)

Dimensional Information in Inches (mm)



Dimensional Information in Inches (mm)



Ordering Information

Description	Catalog Number
4 point Mini Multi-Tee Drop	D970DNUMM4
8 point Mini Multi-Tee Drop	D970DNUMM8
4 point Micro Multi-Tee Drop	D970DNUMR4
8 point Micro Multi-Tee Drop	D970DNUMR8
Mini* Dust Covers (Package of 50)	D970DNCAPM

*Micro Multi-Tees come with Micro Dust Covers.

Each bus requires the use of a termination resistor at each end of the bus's main trunk. The terminator provides the 120 ohms terminating resistance required for network operation. A system may consist of multiple bus networks.

Specifications

Mechanical

- Insert Material Polyurethane
- Molded Body Material . . . Polyurethane
- Contact Material Gold-Plated Brass
- Contact Plating Gold — 0.2 μ m
Nickel — 2 μ m
- Coupling Nut Material . . . Nickel-Plated Brass

Electrical

- Load Resistance 120 Ω
- Voltage 600V DC
- Contact Resistance ≤ 5 m Ω
(After 100 Mate/Unmate
Cycles — Per MIL. STD.
1344, 3004.1)
- Isolation Resistance $\geq 10^9$ Ω

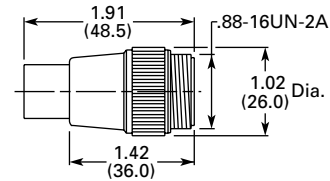
Environmental

- Protection NEMA 1, 3, 4, 6, 13
and IEC IP67
- Ambient Operating
Temperature -40° to +80°C

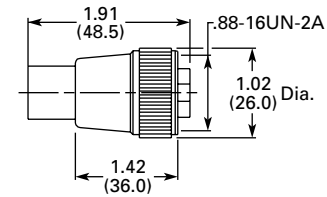
Certifications

- UL UL Recognized,
File No. E141522
- CSA CSA Certified,
File No. LR102502-1
- VDE Spacings to VDE 0110
Group C (250V AC/300V DC)

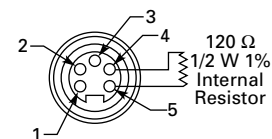
Dimensional Information in Inches (mm)



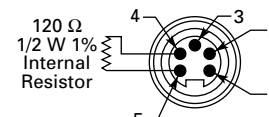
Terminator - Male



Terminator - Female



Female Pin-Out



Male Pin-Out

Ordering Information

Description	Catalog Number
Terminator — Male PVC	D970DNNA
Terminator — Female PVC	D970DNNB

The DeviceNet Power Junction allows power to be safely applied to the network while limiting trunk current. The Power Junction also permits the use of multiple power supplies on the network, eliminating the possibility of mutual interference.

Specifications

Mechanical

- Housing Material Die-cast Aluminum Alloy
Polyester Urethane Powder
Coat Finish Black
- Insert Material Polyurethane
- Contact Material Gold-Plated Brass
- Contact Plating Gold — 5μ In. (Min.)
Palladium/Nickel
— 20μ In. (Min.)
- Receptacle Nickel-Plated Brass

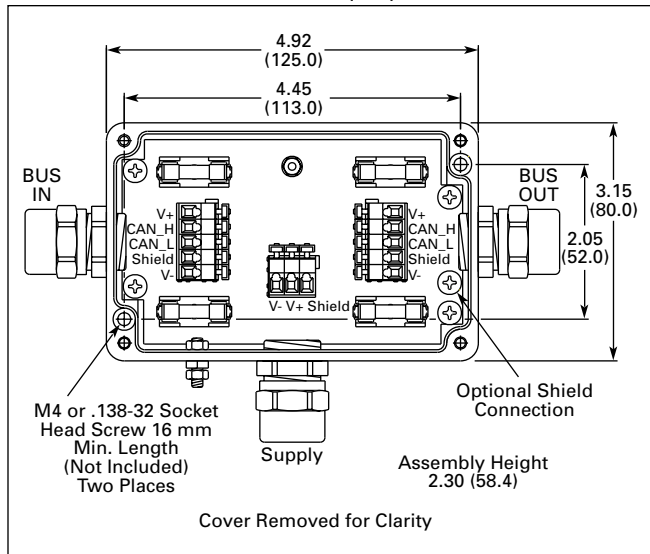
Electrical

- Power 30 Amps Maximum Total
Current; 15 Amps
Each Trunk @ 25°C

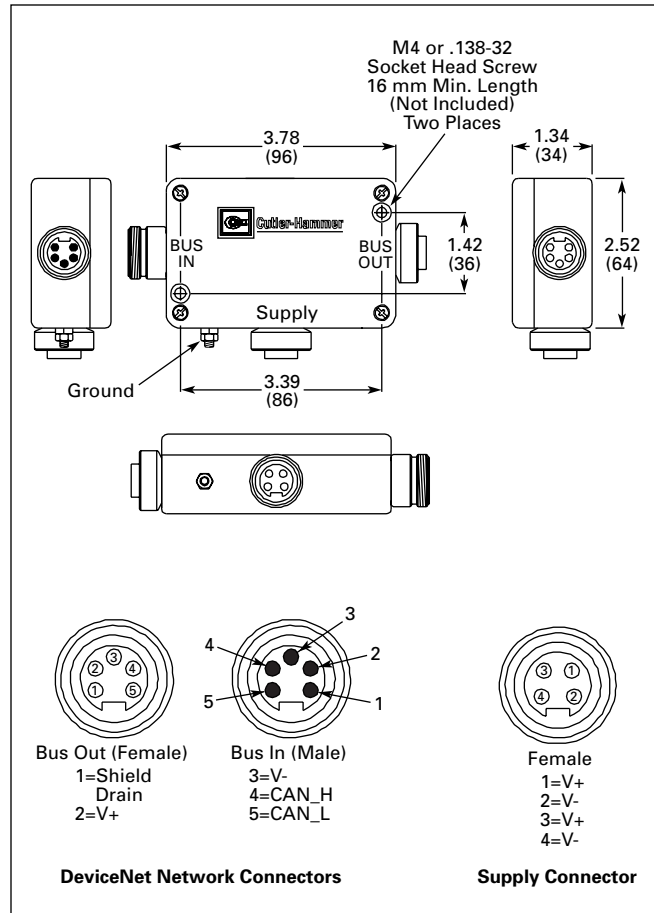
Environmental

- Operating Temperature . . -40° to 70°C
- Storage Temperature . . . -40° to 85°C
- Protection NEMA

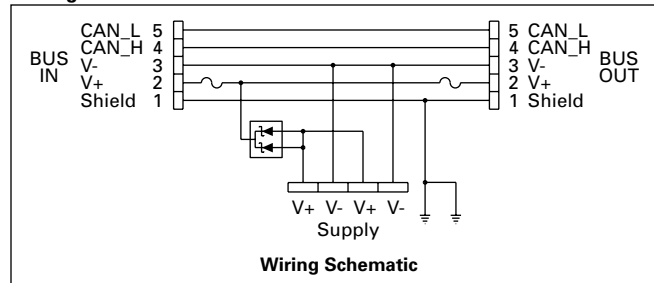
Dimensional Information in Inches (mm) — Terminal Version



Dimensional Information in Inches (mm) — Connector Version



Wiring Schematic



Ordering Information

Description	Catalog Number
Terminal Version	D970DNPTT
Connector Version, Kit Includes 1m, 4 Conductor Power Cord	D970DNPTCK

To order power cable separately:

- 1m, 4 conductor power cable **D970DNMPC**
- 20m, 4 conductor power cable **D970DNMPC20**

Power Cable Pinout

1	Black	V-	2	White	V-	3	Red	V+	4	Green	V+
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