



## Circular HD Connectors



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## Introduction

### Product Facts

- Five shell body size ranging from 14 mm diameter to 27 mm diameter
- Chromate or black chromate finish
- Panel-mount receptacles: IP68 rated with potted, solder cup or pcb termination
- Cable-attach plugs and receptacles: solder cup termination
- Push/pull self-locking mating and unmating
- Scoop proof, blindmating
- Full range of insert configurations
  - Power
  - Signal
  - Power and signal
- Up to 122 signal contacts
- Up to 20 A current rating
- Multiple keying options

### Technical Documents

#### Product Specification:

108-127005

#### Qualification Test Report:

501-127002

### Introduction

TE Connectivity Circular HD Connectors offer the ease of push/pull, self-locking mating for I/O applications. The small, high-density connectors have the advantage of blind mating into small spaces that may normally require clearance for hand tightening to mate. The connectors are widely used in military and civilian use, including radio equipment, medical equipment, test equipment, audio and video equipment, data acquisition and industrial control.



### Performance Characteristics

#### Environmental

- Temperature Range – -65°C to +125°C
- Salt Spray – 96 hr
- Temperature Life – 1000 hr at 125°C (wired, mated connectors)
- Hydrostatic Pressure – Panel-mount receptacle, IP68, 1 m submersion for 2 hr

### Electrical

- Low-Level Contact Resistance – See Table 1
- Dielectric Withstanding Voltage – See Table 2
- Insulation Resistance – 5000 megohms min. 100 megohms min. at elevated temperature (125°C)

### Mechanical

- Random Vibration – 15 grms between 10-2000 Hz
- Mechanical Shock – 50 g half-sine pulse of 3 ms duration
- Durability – 1000 mating cycles

### Materials

- Shells – Chromate- or black chromate-plated brass
- Contacts – Gold-plated copper alloy
- Dielectric – Thermoplastic, PEEK

**Table 1: Contact and Wire Information**

Contact Dia. (mm)	Solder Cup Dia. (mm)	Wire Size (Max)		Contact Resistance (mΩ)	Separation Force (N), Contact Pair
		AWG	mm <sup>2</sup>		
0.5	0.4	28	0.06	21	0.15~0.6
0.7	0.6	24	0.15	21	0.2~0.6
0.9	0.8	22	0.38	5	0.5~1
1.3	1.2	18	0.62	3	0.8~2
1.6	1.8	16	2.0	2.5	0.5~2
2.0	2.0	14	2.0	2	1~3
2.3	2.1	12	3.0	1.5	2~3
3.0	3.1	10	5.0	1	4~7

**Table 2: Insert Dielectric Withstanding Voltage**

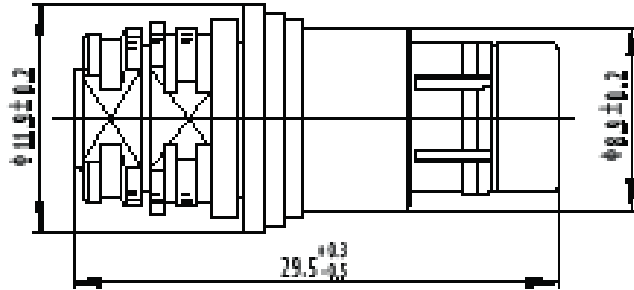
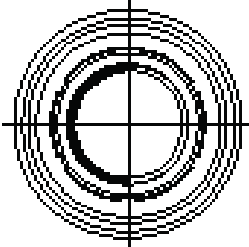
Insert Configuration	VAC @ Height	
	Sea Level	70,000 ft (21,336 m)
I	1000	250
II	875	225
III	725	175

**Descriptive Information: Sample of Descriptive Part Number**

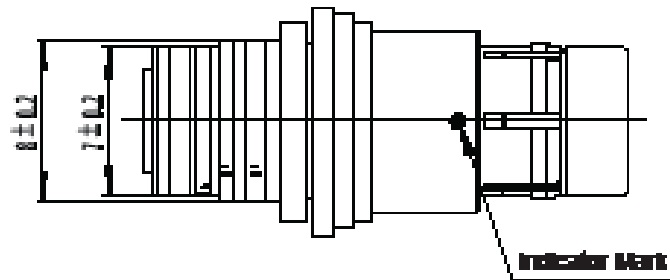
	<b>Shell Size</b>	<b>Shell Finish</b>	<b>Connector Type/ Gender</b>	<b>Insert Layout</b>	<b>Contact Layout</b>	<b>Keying Options</b>
	3	B	p	053	1	1
<b>Shell Size Series</b>	<ul style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>5</li> </ul>					
<b>Shell Finish</b>	<ul style="list-style-type: none"> <li><b>B</b> Black Chromate</li> <li><b>N</b> Natural Chromate</li> </ul>					
<b>Connector Type/Gender</b>	<ul style="list-style-type: none"> <li><b>P</b> Plug, Cable Attach</li> <li><b>R</b> Receptacle, Cable Attach</li> <li><b>A</b> Receptacle, Panel Mount, Wire Attach</li> <li><b>B</b> Receptacle, Panel Mount, Board-Mount</li> </ul>					
<b>Insert Layout</b>	See Individual Shell Size Series Pages for Insert Layout Code					
<b>Contact Layout</b>	<ul style="list-style-type: none"> <li><b>1</b> – Receptacle with Sockets</li> <li><b>2</b> – Plug with Pins</li> <li><b>3</b> – Receptacle with Pins</li> <li><b>4</b> – Plug with Sockets</li> </ul>					
<b>Keying Options</b>	<ul style="list-style-type: none"> <li><b>1</b> – Single Key</li> <li><b>2</b> – Double Key</li> <li><b>3</b> – Triple Key</li> </ul>					

### Shell Series 1

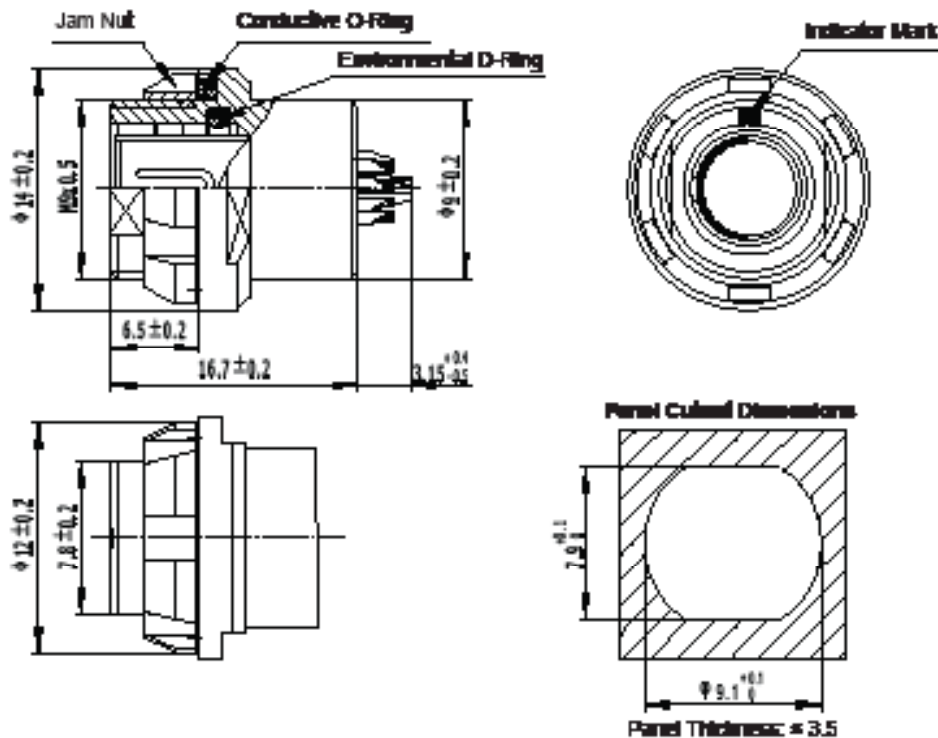
#### Free-Hanging Cable-Attach Plug



Maximum cable diameter = 3.8 mm

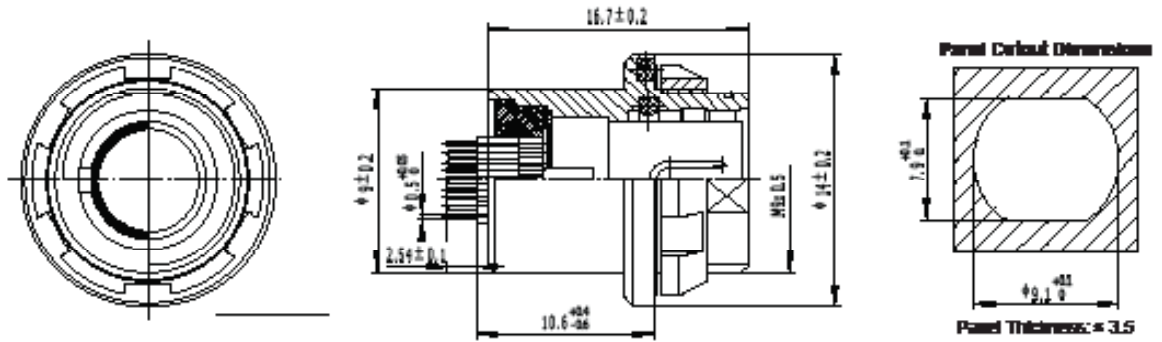


#### Panel-Mount Wire Termination Receptacle



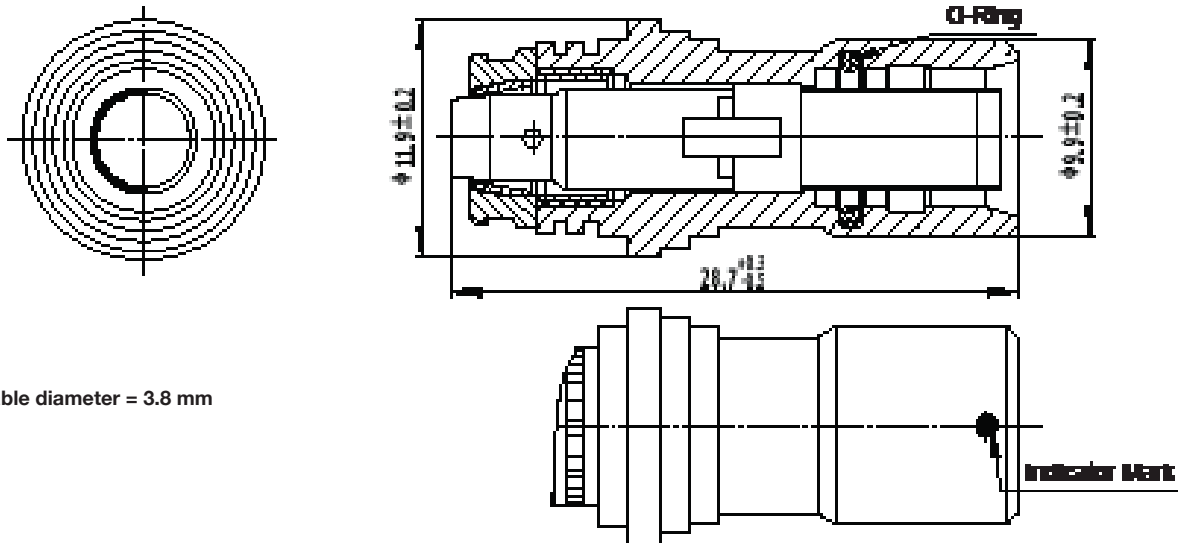
### Shell Series 1

#### Panel-Mount, Board-Mount Receptacle



Note: Available for 0.5, 0.7, and 0.9-mm-dia contacts

#### Free-Hanging Cable-Attach Receptacle



Maximum cable diameter = 3.8 mm

### Shell Series 1 Contact Arrangements

Contact Arrangement

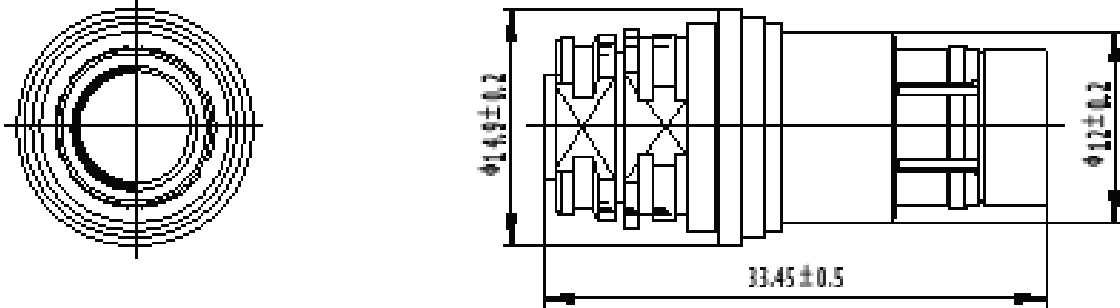
Receptacle (A) Socket Contacts	Plug (B) Pin Contacts	Receptacle (A) Pin Contacts	Plug (B) Socket Contacts	Layout Code	No. of Contacts (Contact Dia.)	Current Rating (A)	DWV*
				051	2 (0.9 mm)	6.3	II
				052	3 (0.9 mm)	5.5	II
				053	4 (0.7 mm)	3.8	III
				054	5 (0.7 mm)	3.6	III
				056	7 (0.5 mm)	1.5	III
				059	9 (0.5 mm)	1.0	III

\*Dielectric Withstanding Voltage: see Table 2, page 3

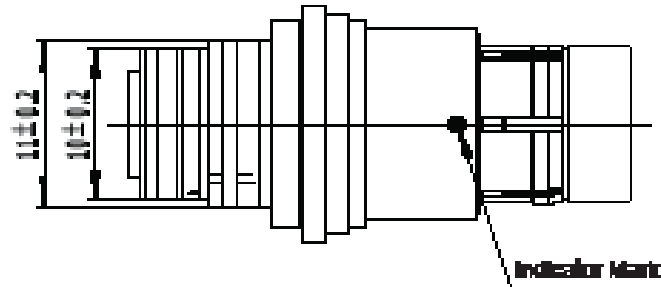


## Shell Series 2

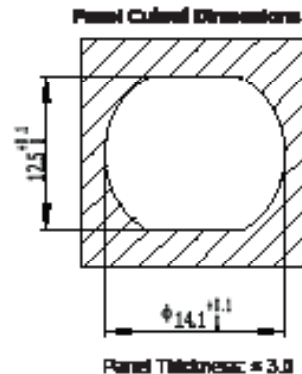
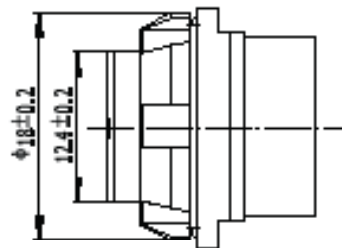
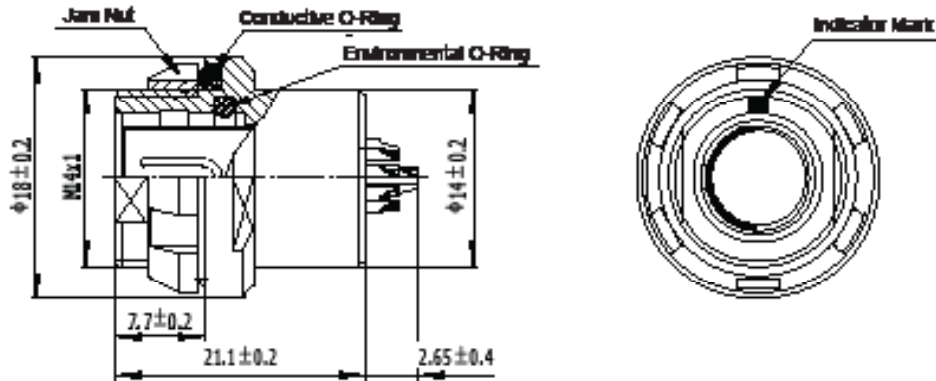
### Free-Hanging Cable-Attach Plug



Maximum cable diameter = 6.0 mm



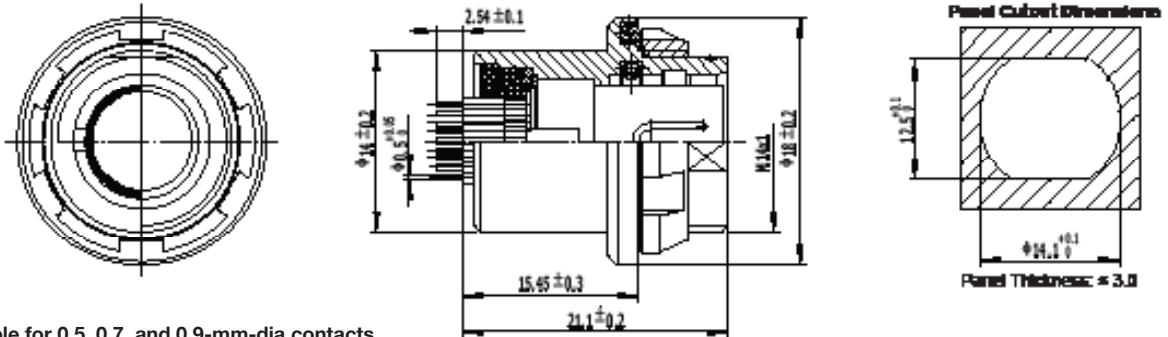
### Panel-Mount Wire Termination Receptacle





### Shell Series 2

#### Panel-Mount, Board-Mount Receptacle



Note: Available for 0.5, 0.7, and 0.9-mm-dia contacts

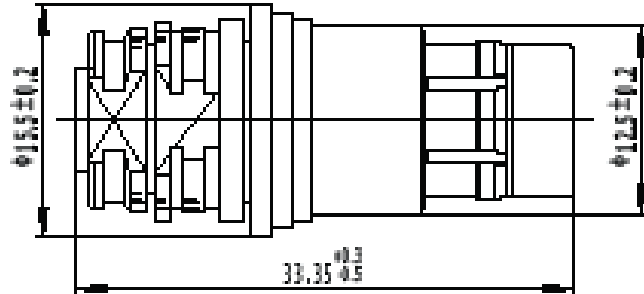
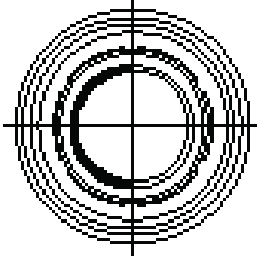
#### Contact Arrangement

Receptacle (A) Socket Contacts	Plug (B) Pin Contacts	Receptacle (A) Pin Contacts	Plug (B) Socket Contacts	Layout Code	No. of Contacts (Contact Dia.)	Current Rating (A)	DWV*
				051	2 (1.3 mm)	9	I
				052	3 (1.3 mm)	8.5	I
				053	4 (0.9 mm)	5.0	II
				054	5 (0.9 mm)	4.8	II
				056	6 (0.7 mm)	3.5	II
				057	7 (0.7 mm)	3.2	II
				058	8 (0.7 mm)	2.5	III
				062	12 (0.5 mm)	1.5	III

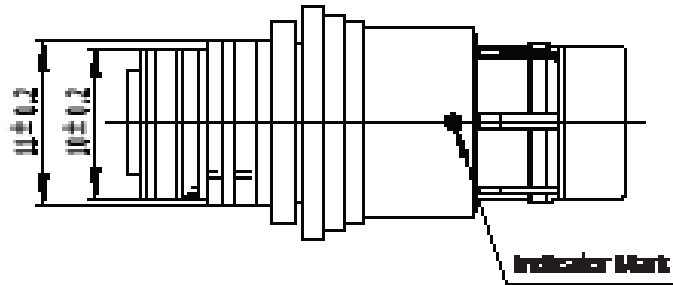
\*Dielectric Withstanding Voltage: see Table 2, page 3

### Shell Series 3

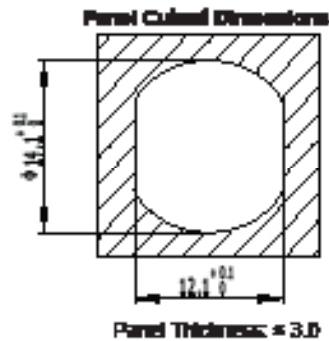
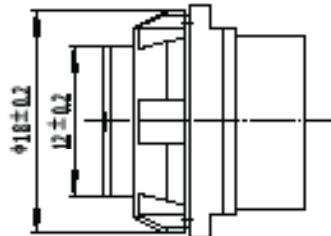
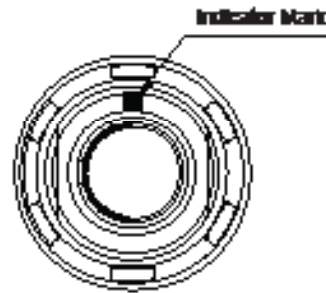
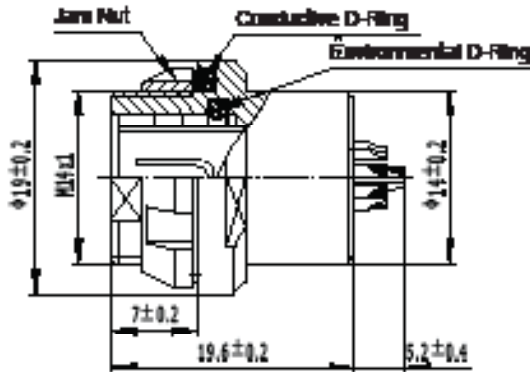
#### Free-Hanging Cable-Attach Plug



Maximum cable diameter = 6.2 mm

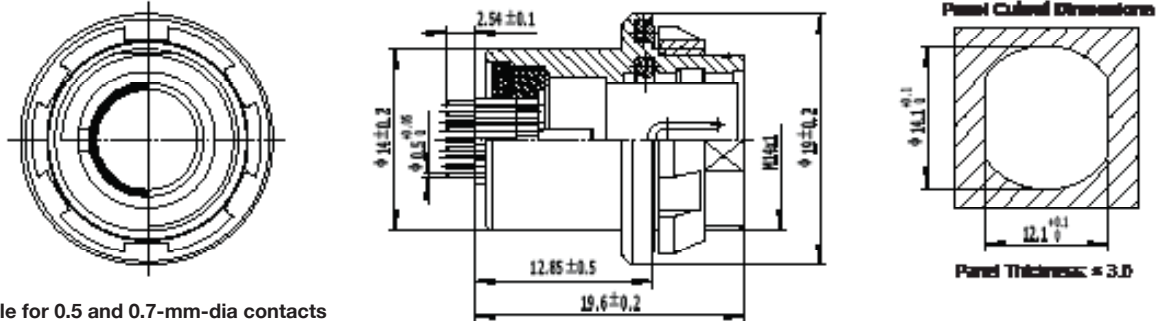


#### Panel-Mount Wire Termination Receptacle



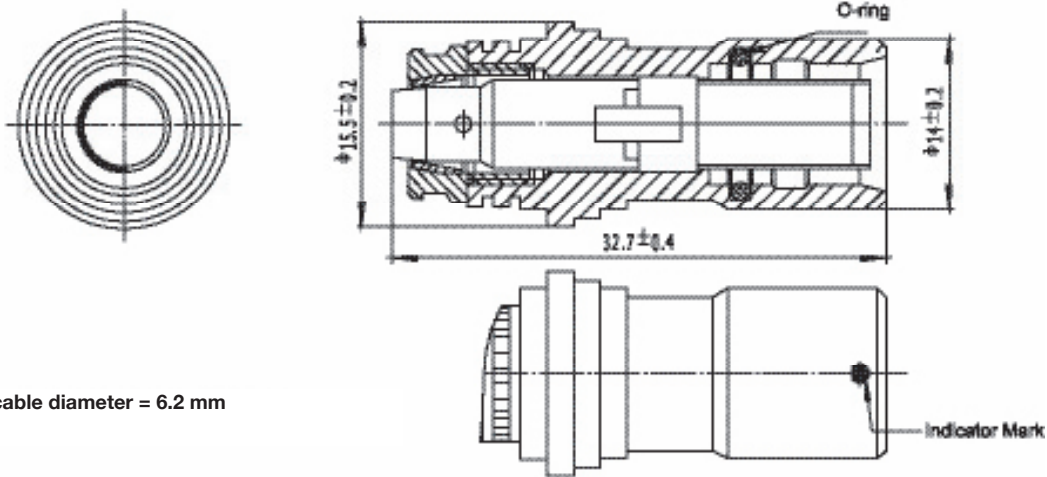
### Shell Series 3

#### Panel-Mount, Board-Mount Receptacle



Note: Available for 0.5 and 0.7-mm-dia contacts

#### Free-Hanging Cable-Attach Receptacle



Maximum cable diameter = 6.2 mm

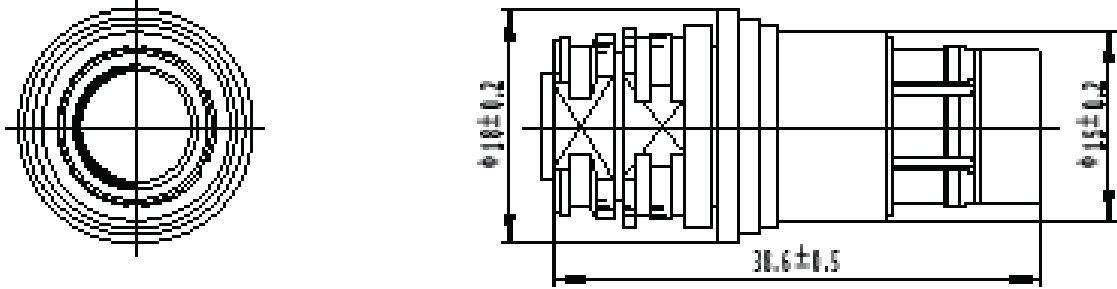
#### Contact Arrangement

Receptacle (A) Socket Contacts	Plug (B) Pin Contacts	Receptacle (A) Pin Contacts	Plug (B) Socket Contacts	Layout Code	No. of Contacts (Contact Dia.)	Current Rating (A)	DWV*
				010	10 (0.7 mm)	3.2	II
				012	12 (0.7 mm)	3.0	II
				019	19 (0.5 mm)	1.8	III

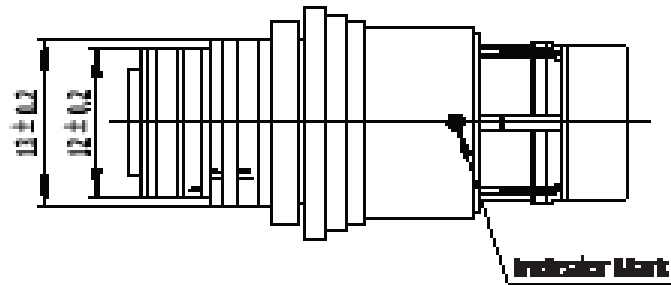
\*Dielectric Withstanding Voltage: see Table 2, page 3

### Shell Series 4

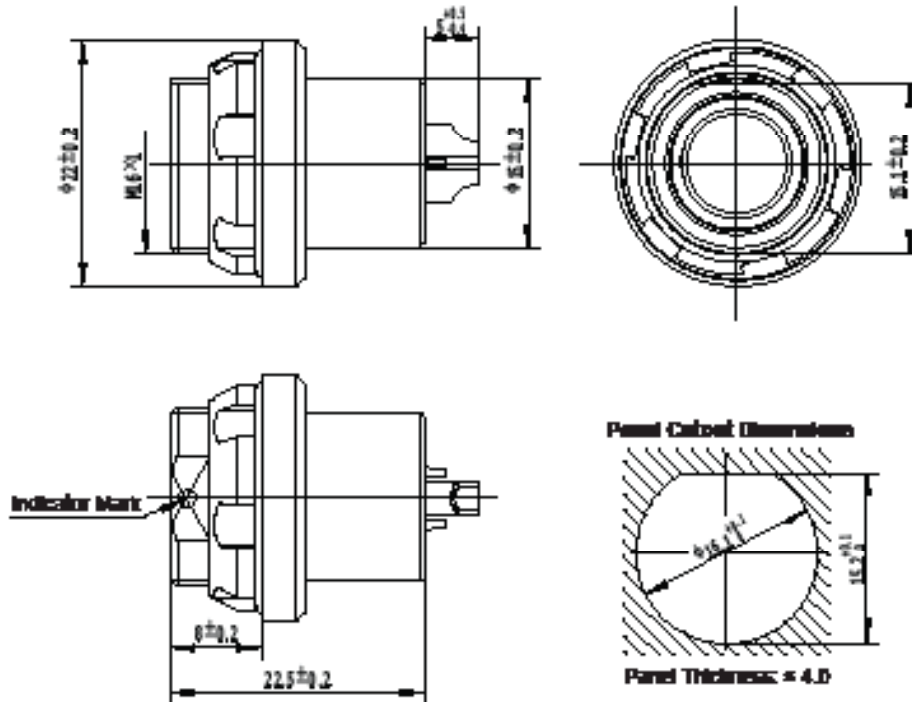
#### Free-Hanging Cable-Attach Plug



Maximum cable diameter = 8.0 mm

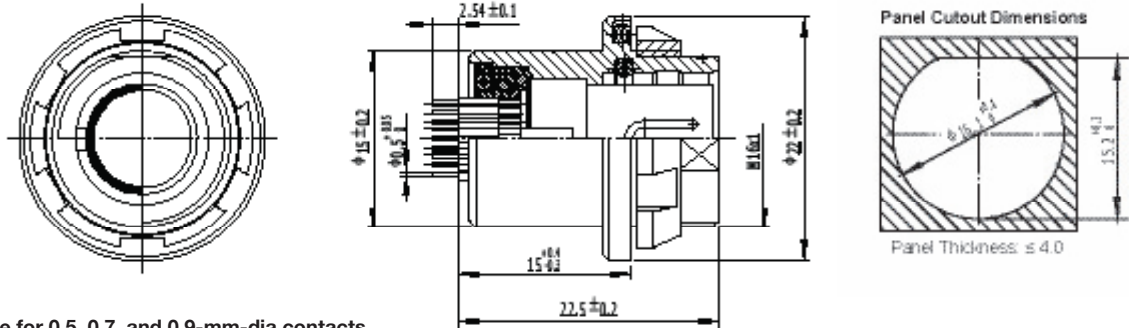


#### Panel-Mount Wire Termination Receptacle



## Shell Series 4

### Panel-Mount, Board-Mount Receptacle



Note: Available for 0.5, 0.7, and 0.9-mm-dia contacts



### Shell Series 4 Contact Arrangements

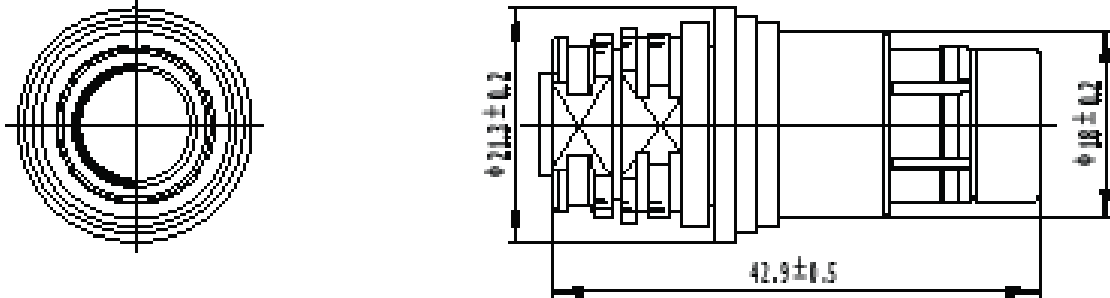
Contact Arrangement

Receptacle (A) Socket Contacts	Plug (B) Pin Contacts	Receptacle (A) Pin Contacts	Plug (B) Socket Contacts	Layout Code	No. of Contacts (Contact Dia.)	Current Rating (A)	DWV*
				051	2 (1.6 mm)	15	I
				040	3 (1.6 mm)	13	I
				037	4 (1.3 mm)	8	II
				087	2 (2.3 mm) 2 (0.9 mm)	20 2.0	II
				053	5 (1.3 mm)	7.5	II
				065	6 (0.9 mm)	4.5	II
				054	7 (0.9 mm)	4.5	II
				066	8 (0.9 mm)	4.5	II
				055	1 (1.3 mm) 8 (0.9 mm)	8.0 4.0	II
				056	11 (0.9 mm)	4.0	II
				086	16 (0.7 mm)	2.8	III
				092	19 (0.7 mm)	2.5	III

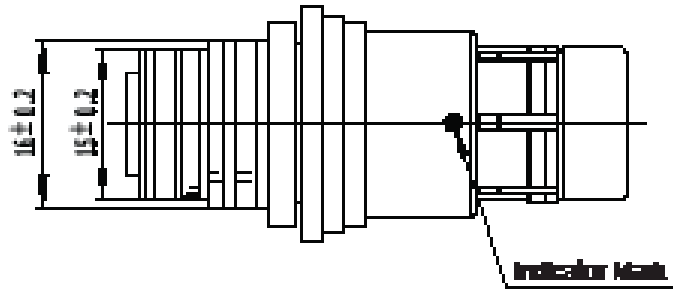
\*Dielectric Withstanding Voltage: see Table 2, page 3

Shell Series 5

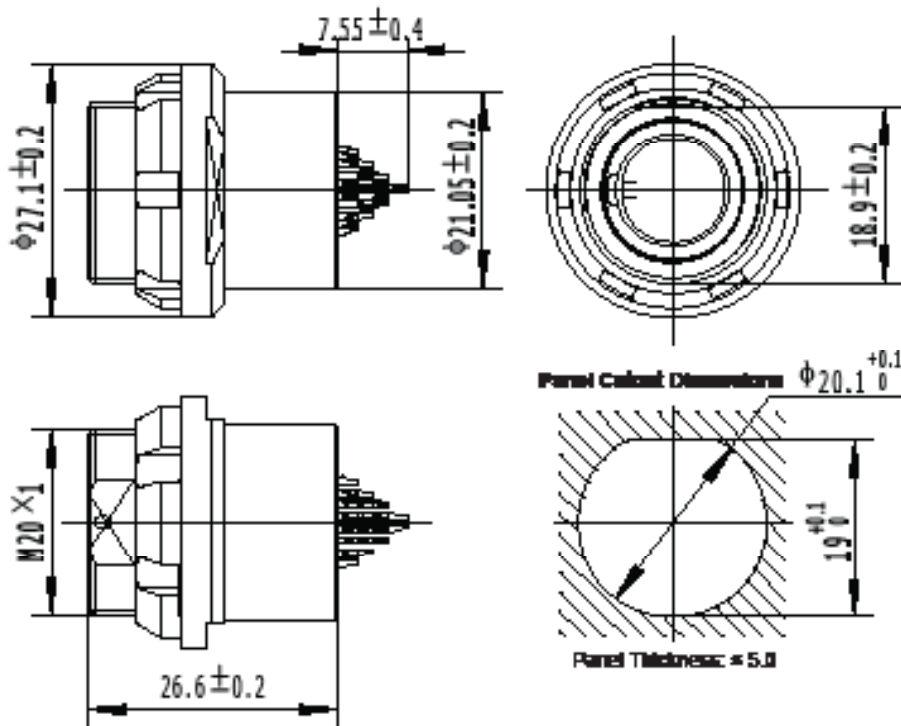
Free-Hanging Cable-Attach Plug



Maximum cable diameter = 10.0 mm

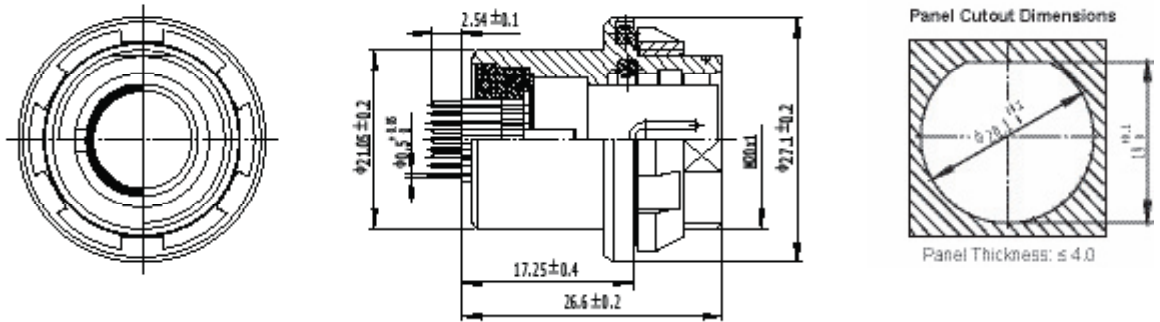


Panel-Mount Wire Termination Receptacle



### Shell Series 5

#### Panel-Mount, Board-Mount Receptacle



and 0.9-mm-dia contacts

#### Contact Arrangement

Receptacle (A) Socket Contacts	Plug (B) Pin Contacts	Receptacle (A) Pin Contacts	Plug (B) Socket Contacts	Layout Code	No. of Contacts (Contact Dia.)	Current Rating (A)	DWV*
				051	2 (2.0 mm)	18	I
				087	2 (3.0 mm)	20	I
				052	3 (2.0 mm)	16	I
				053	4 (2.0 mm)	14	II
				054	1 (2.0 mm) 6 (1.3 mm)	19 5.0	II
				067	8 (1.3 mm)	7.2	II
				101	1 (2.0 mm) 8 (1.3 mm)	19 4.0	II
				062	10 (1.3 mm)	6.3	II
				069	12 (1.3 mm)	5.5	II

\*Dielectric Withstanding Voltage: see Table 2, page 3



### Shell Series 5 Contact Arrangements

Contact Arrangement

Receptacle (A) Socket Contacts	Plug (B) Pin Contacts	Receptacle (A) Pin Contacts	Plug (B) Socket Contacts	Layout Code	No. of Contacts (Contact Dia.)	Current Rating (A)	DWV*
				104	3 (1.3 mm) 10 (0.7 mm)	10 1	II
				058	15 (0.9 mm)	2.7	II
				110	4 (1.6 mm) 12 (0.7 mm)	10 0.5	II
				038	18 (0.9 mm)	3.2	III
				102	27 (0.7 mm)	2.2	III
				093	24 (0.7 mm)	2.5	III
				122	40 (0.5 mm)	1	III
				137	10 (0.7 mm) 27 (0.5 mm)	2.2 1	III

\*Dielectric Withstanding Voltage: see Table 2, page 3



## Connector Accessories

### Sealing Boots



Series, Free-Hanging Connector	Cable Diameter Range (in)	Part No.	
		Boot Description (Straight)	Boot Description (90°)
Series 1	> 0.15	202A111-3/42-0	222A111-3/42-0
Series 2	0.15-0.24	202A111-3/42-0	222A111-3/42-0
	0.21-0.24	202A121-3/42-0	222A121-3/42-0
Series 3	0.15-0.24	202A111-3/42-0	222A111-3/42-0
	0.21-0.24	202A121-3/42-0	222A121-3/42-0
Series 4	0.21-0.31	202A121-3/42-0	222A121-3/42-0
Series 5	0.26-0.39	202A132-3/42-0	222A132-3/42-0

**Notes:** If the cable diameter falls below the minimum diameter heat shrink tubing may be used to shim the boot.  
All boots are precoated with Raychem /42 hot-melt adhesive.

### Dust Caps



Series	Part No.	
	Plug	Receptacle
Series 1	2157014-1	2157015-1
Series 2	2101580-1	2101579-1
Series 3	2157927-1	2157928-1
Series 4	2157929-1	2157930-1
Series 5	2101580-2	2101579-2

### Cross Reference: Descriptive Part Number to TE Part Number

Shell Series	Type	Configuration	Descriptive Part No.	TE Part No.
1	Panel-Mount Receptacle	3 Pos Sockets, PCB Tails, Single Key	1-B-B-052-1-1	2157738-1
		7 Pos Sockets, PCB Tails, Double Key	1-B-B-056-1-2	2157951-1
		7 Pos Sockets, PCB Tails, Single Key	1-B-B-056-1-1	2157949-1
		9 Pos Sockets, PCB Tails, Double Key	1-B-B-059-1-2	2157952-1
		9 Pos Sockets, PCB Tails, Single Key	1-B-B-059-1-1	2157950-1
	Plug	3 Pos Pins, Solder Cup Tails, Single Key	1-B-P-052-2-1	2157739-1
		7 Pos Pins, Solder Cup Tails, Double Key	1-B-P-056-2-2	2157947-1
		7 Pos Pins, Solder Cup Tails, Single Key	1-B-P-056-2-1	2157945-1
		9 Pos Pins, Solder Cup Tails, Double Key	1-B-P-059-2-2	2157948-1
		9 Pos Pins, Solder Cup Tails, Single Key	1-B-P-059-2-1	2157946-1
2	Panel-Mount Receptacle	7 Pos Sockets, PCB Tails, Single Key	2-B-B-057-1-1	2101553-1
		7 Pos Sockets, PCB Tails, Double Key	2-B-B-057-1-2	2101553-2
		7 Pos Sockets, Solder Cup Tails, Single Key	2-B-A-057-1-1	2101676-1
		7 Pos Sockets, Solder Cup Tails, Double Key	2-B-A-057-1-2	2101676-2
		8 Pos Sockets, PCB Tails, Single Key	2-B-B-058-1-1	2157375-1
		8 Pos Sockets, PCB Tails, Double Key	2-B-B-058-1-2	2157375-2
		8 Pos Sockets, PCB Tails, Third Key	2-B-B-058-1-3	2157375-3
	Plug	12 Pos Sockets, PCB Tails, Double Key	2-B-B-062-1-2	2157538-2
		12 Pos Sockets, PCB Tails, Single Key	2-B-B-062-1-1	2157538-1
		7 Pos Pins, Solder Cup Tails, Single Key	2-B-P-057-2-1	2101550-1
		7 Pos Pins, Solder Cup Tails, Double Key	2-B-P-057-2-2	2101550-2
		8 Pos Pins, Solder Cup Tails, Single Key	2-B-P-058-2-1	2157376-1
		8 Pos Pins, Solder Cup Tails, Double Key	2-B-P-058-2-2	2157376-2
		8 Pos Pins, Solder Cup Tails, Third Key	2-B-P-058-2-3	2157376-3
4	Panel-Mount Receptacle	12 Pos Pins, Solder Cup Tails, Double Key	2-B-P-062-2-2	2157539-2
		12 Pos Pins, Solder Cup Tails, Single Key	2-B-P-062-2-1	2157539-1
		4 Pos Pins, Solder Cup Tails, Single Key	4-B-A-087-3-1	2157468-1
	Plug	4 Pos Pins, Solder Cup Tails, Double Key	4-B-A-087-3-2	2157468-2
		19 Pos Sockets, PCB Tails, Single Key	4-B-B-092-1-1	2157342-1
		19 Pos Sockets, Solder Cup Tails, Single Key	4-B-A-092-1-1	2157343-1
5	Panel-Mount Receptacle	4 Pos Sockets, Solder Cup Tails, Single Key	4-B-P-087-4-1	2157469-1
		4 Pos Sockets, Solder Cup Tails, Double Key	4-B-P-087-4-2	2157469-2
		19 Pos Pins, Solder Cup Tails, Single Key	4-B-P-092-2-1	2157344-1
		40 Pos Sockets, PCB Tails, Single Key	5-B-B-122-1-1	2101549-1
	Plug	40 Pos Sockets, Solder Cup Tails, Single Key	5-B-A-122-1-1	2101677-1
		40 Pos, Sockets, PCB Tails, Double Key	5-B-B-122-1-2	2101549-2
		40 Pos, Sockets, Solder Cup Tails, Double Key	5-B-A-122-1-2	2101677-2
		40 Pos Pins, Solder Cup Tails, Double Key	5-B-P-122-2-2	2101551-2
		40 Pos Pins, Solder Cup Tails, Single Key	5-B-P-122-2-1	2101551-1

## FOR MORE INFORMATION

### Technical Support

Internet:	<a href="http://www.te.com/ADM">www.te.com/ADM</a>
USA:	+1 (800) 522-6752
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C. America:	+52 (0) 55-1106-0814
South America:	+55 (0) 11-2103-6000
Germany:	+49 (0) 6251-133-1999
Great Britain:	+44 (0) 8706-080208
France:	+33 (0) 1-3420-8686
Netherlands:	+31 (0) 73-6246-999
China:	+86 (0) 400-820-6015

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