CIRCULAR HD CONNECTORS

Small-Space, High-Density Connectors for I/O Applications

WIDE RANGE OF CHOICE

- Five shell body sizes ranging from 14 mm to 27 mm diameter
- Up to 40 signal contacts
- Up to 20 amps current rating

APPLICATION FLEXIBILITY

- Panel-mount receptacles: IP68 rated with potted, solder cup or pcb termination
- Cable-attach plugs and receptacles: solder cup termination
- Chromate or black chromate finish

EASY TO USE

- Push/pull self-locking mating and unmating
- Scoop proof, blindmating

FULL RANGE OF INSERT CONFIGURATIONS

- Power, signal, or power and signal
- Multiple keying options

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

ELECTRICAL

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

MATERIALS

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

ENVIRONMENTAL

- **Temperature Range:** -65°C to +125C°
- **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

MECHANICAL

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

TECHNICAL DOCUMENTS

- **Product Specification:** 108-127005
- **Qualification Test Report:** 501-127002

Circular HD Connectors

Table 1: Contact and Wire Information

Contact Dia. (mm)	Solder Cup Dia. (mm)	Wire Size (Max.)		Contact Resistance (mΩ)	Separation Force (N), AWG mm² Contact Pair
		AWG	mm²		
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

Descriptive Part Number Example:

Shell Size	Shell Finish	Connector Type/ Gender	Insert Layout	Contact Layout	Keying Options
3	B	p	A	1	1

Shell Size Series
- **1**
- **2**
- **3**
- **4**
- **5**

Shell Finish
- **B** = Black Chromate
- **N** = Natural Chromate

Connector Type/Gender
- **P** = Plug, Cable Attach
- **R** = Receptacle, Cable Attach
- **A** = Receptacle, Panel Mount, Wire Attach
- **B** = Receptacle, Panel Mount, Board-Mount

Insert Layout

See Individual Shell Size Series Pages for Insert Layout Code

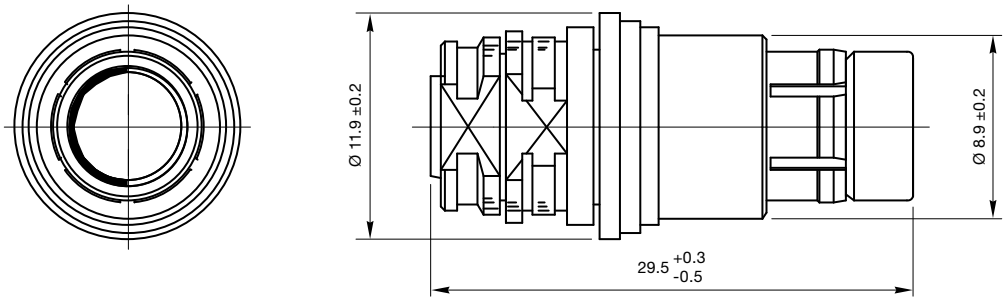
Contact Layout
- **1** = Receptacle with Sockets
- **2** = Plug with Pins
- **3** = Receptacle with Pins
- **4** = Plug with Sockets

Keying Options
- **1** = Single Key
- **2** = Double Key
- **3** = Triple Key

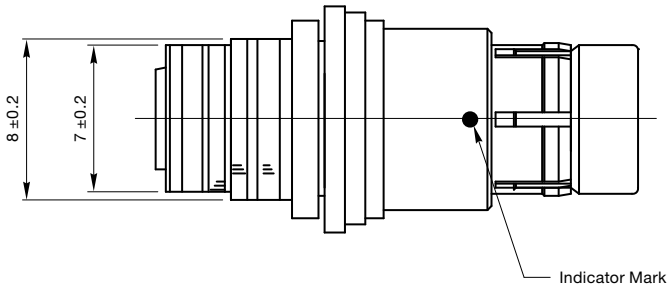
Circular HD Connectors

SHELL SERIES 1

Free-Hanging Cable-Attach Plug

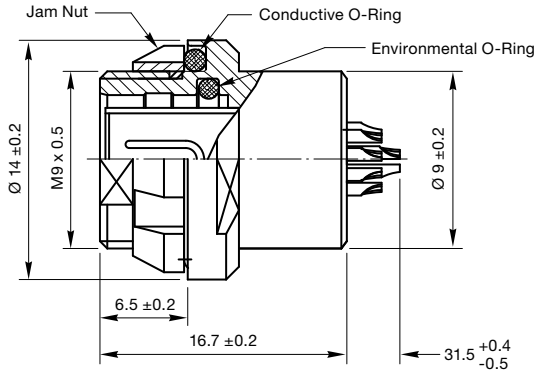


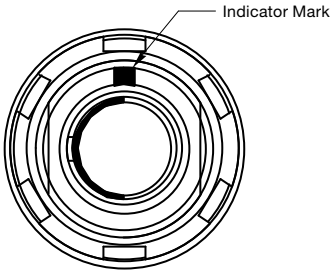
Maximum cable diameter = 3.8 mm

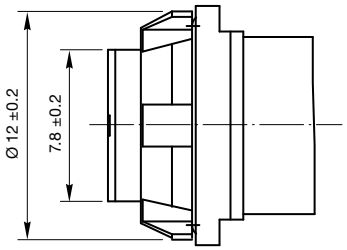


Panel-Mount Wire Termination Receptacle

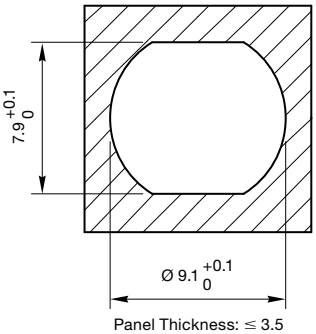
Installation torque for mounting to panel: 1.5 ft-lb min.







Panel Cutout Dimensions

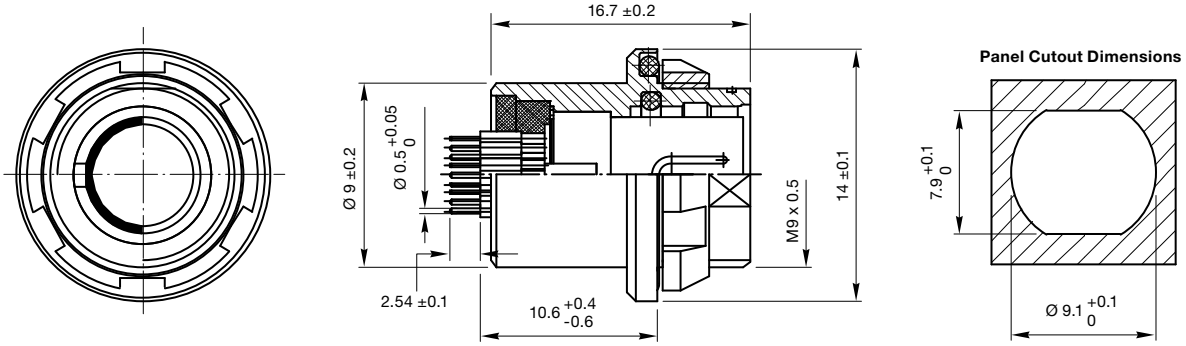


Circular HD Connectors

SHELL SERIES 1

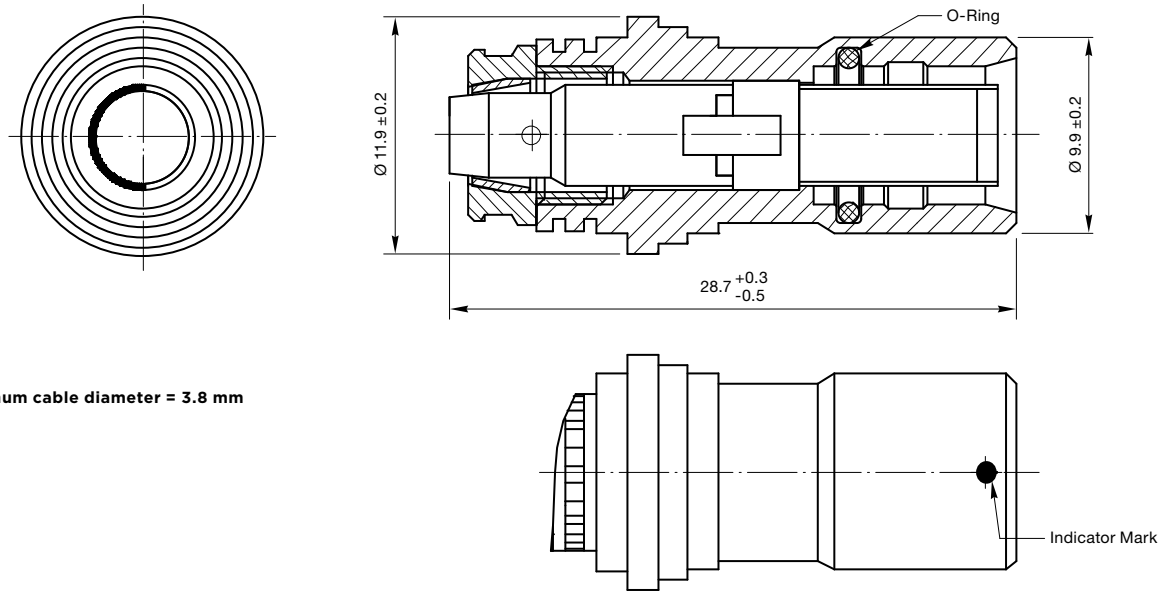
Panel-Mount, Board-Mount Receptacle

Installation torque for mounting to panel: 1.5 ft-lb min.



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

Free-Hanging Cable-Attach Receptacle



Maximum cable diameter = 3.8 mm

Circular HD Connectors

SHELL SERIES 1

Contact Arrangement

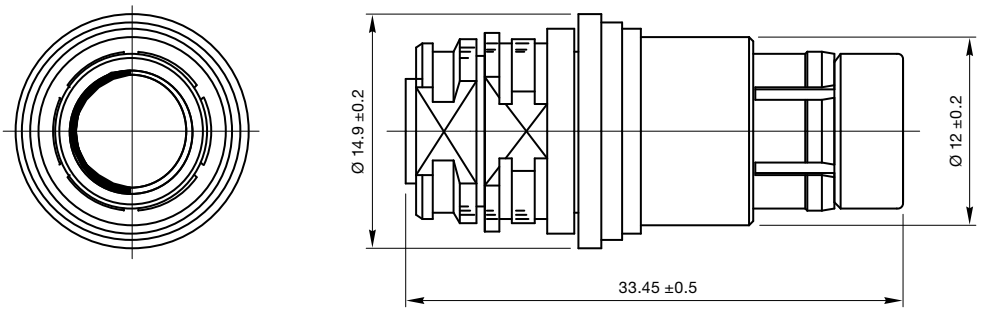
Receptacle (A) Socket Contacts	Plug (B) Pin Contacts	Receptacle (A) Pin Contacts	Plug (B) Socket Contacts	Layout Code	No. of Contacts (Contact Dia.)	Current Rating (A)	DWV*
				A	2 (0.9 mm)	6.3	II
				B	3 (0.9 mm)	5.5	I|
				C	4 (0.7 mm)	3.8	III
				D	5 (0.7 mm)	3.8	III
				E	7 (0.5 mm)	1.5	III
				F	9 (0.5 mm)	1.0	III

*Dielectric Withstanding Voltage: see Table 2, page 28.

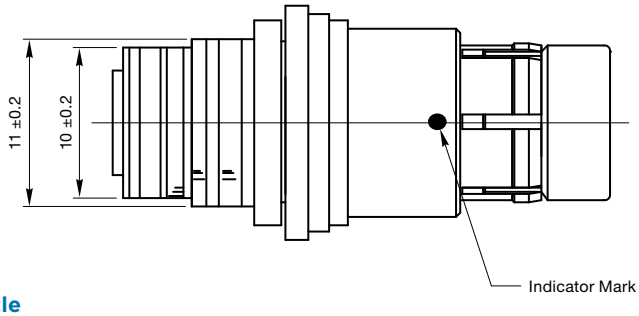
Circular HD Connectors

SHELL SERIES 2

Free-Hanging Cable-Attach Plug

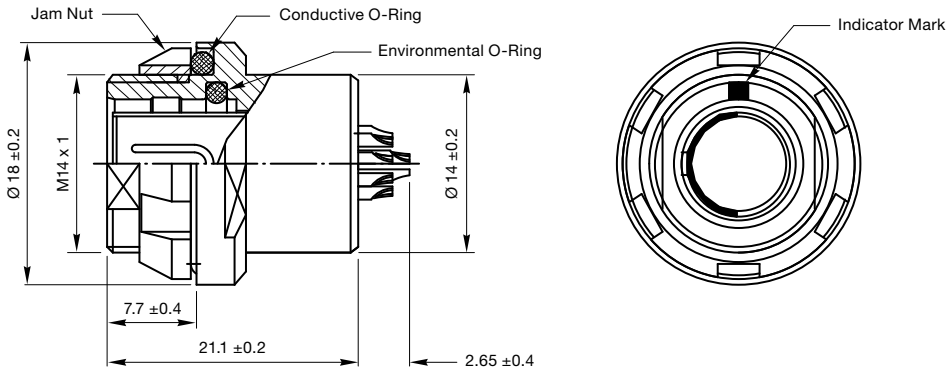


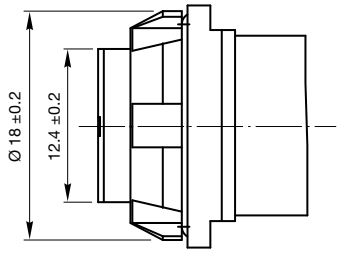
Maximum cable diameter = 6.0 mm



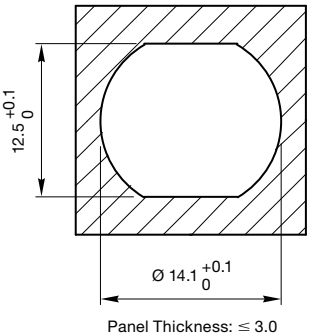
Panel-Mount Wire Termination Receptacle

Installation torque for mounting to panel: 2.5 ft-lb min.





Panel Cutout Dimensions



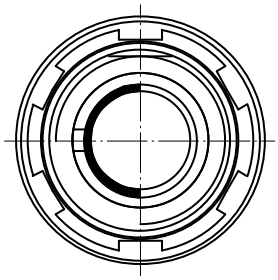
Panel Thickness: ≤ 3.0

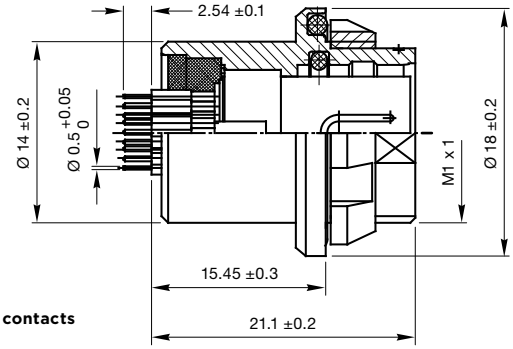
Circular HD Connectors

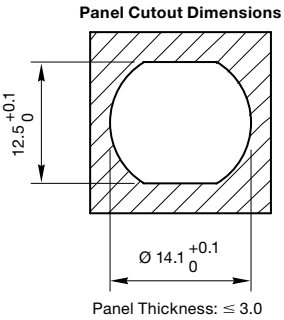
SHELL SERIES 1

Panel-Mount, Board-Mount Receptacle

Installation torque for mounting to panel: 2.5 ft-lb min.

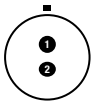
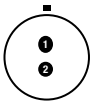
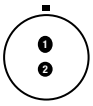
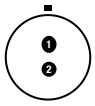
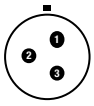
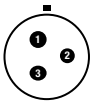
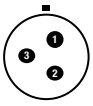
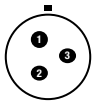
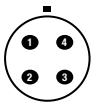
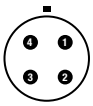
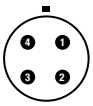
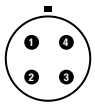
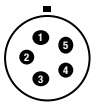
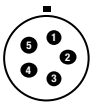
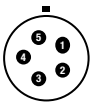
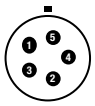
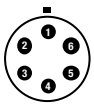
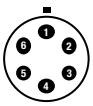
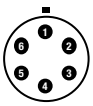
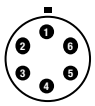
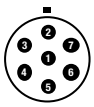
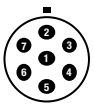
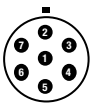
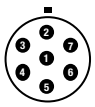
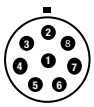
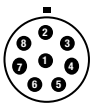
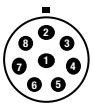
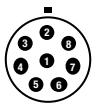






Note: Available for 0.5, 0.7, and 0.9-mm-dia contacts

Contact Arrangement

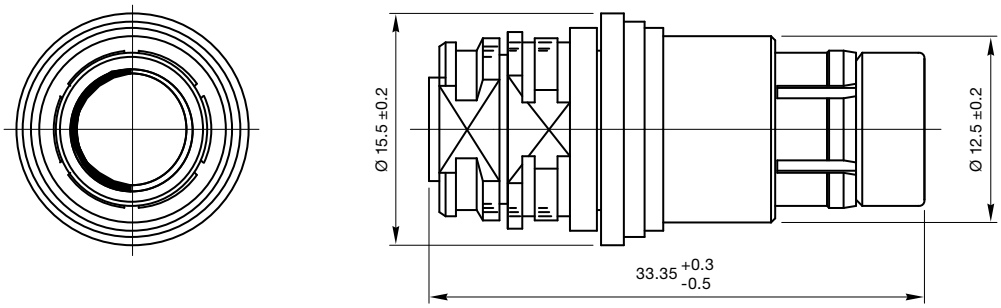
Receptacle (A) Socket Contacts	Plug (B) Pin Contacts	Receptacle (A) Pin Contacts	Plug (B) Socket Contacts	Layout Code	No. of Contacts (Contact Dia.)	Current Rating (A)	DWV*
				A	2 (1.3 mm)	9	I
				B	3 (1.3 mm)	8.5	I
				C	4 (0.9 mm)	5.0	II
				D	5 (0.9 mm)	4.8	II
				E	6 (0.7 mm)	3.5	II
				F	7 (0.7 mm)	3.2	II
				G	8 (0.7 mm)	2.5	III
				H	12 (0.5 mm)	1.5	III

*Dielectric Withstanding Voltage: see Table 2, page 28.

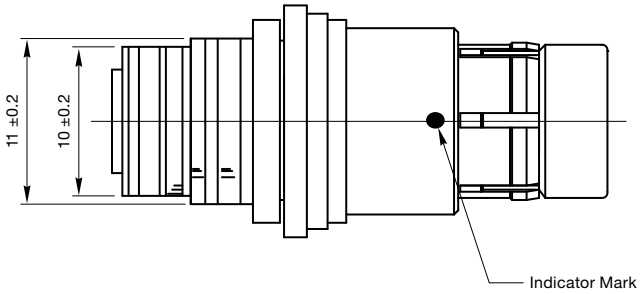
Circular HD Connectors

SHELL SERIES 3

Free-Hanging Cable-Attach Plug

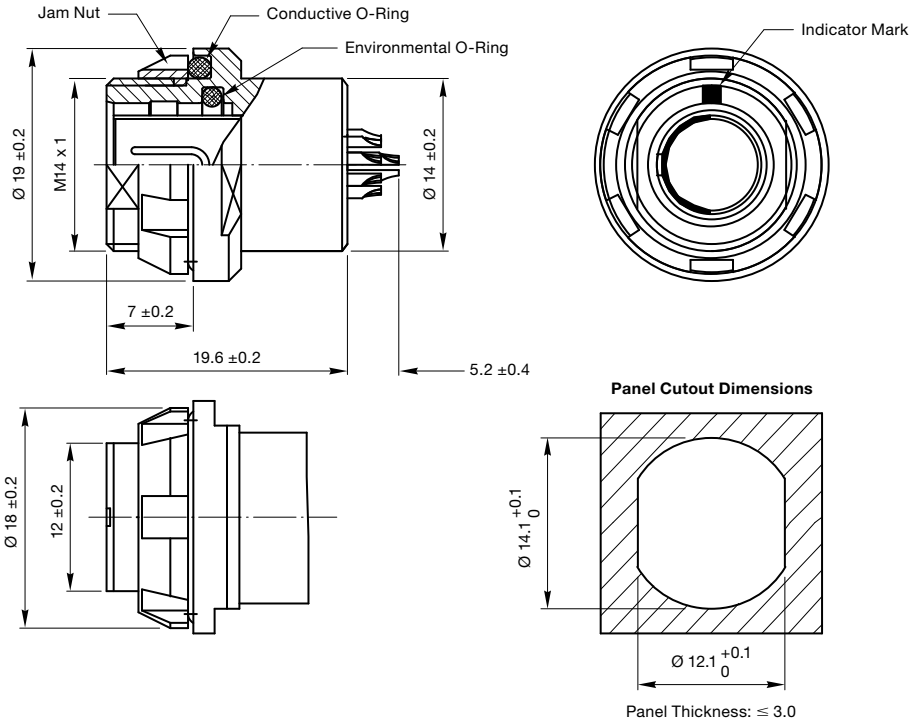


Maximum cable diameter = 6.2 mm



Panel-Mount Wire Termination Receptacle

Installation torque for mounting to panel: 2.5 ft-lb min.

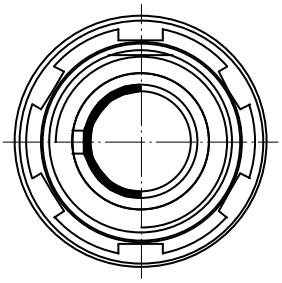


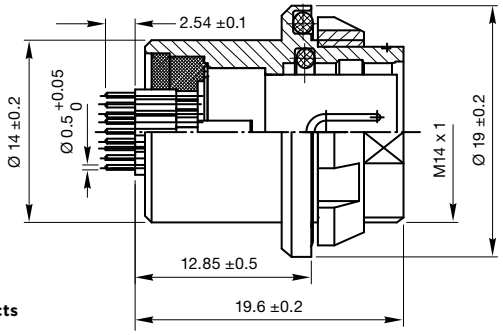
Circular HD Connectors

SHELL SERIES 3

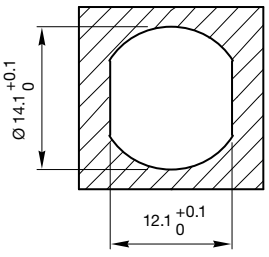
Panel-Mount, Board-Mount Receptacle

Installation torque for mounting to panel: 2.5 ft-lb min.





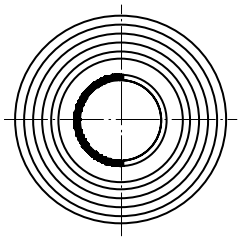
Panel Cutout Dimensions

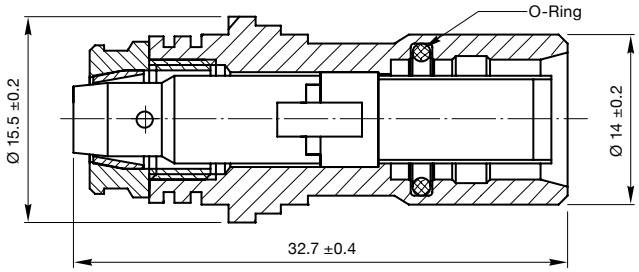


Panel Thickness: ≤ 3.0

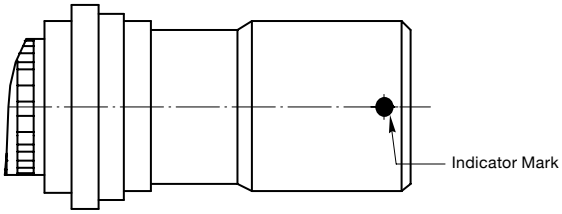
Note: Available for 0.5 and 0.7-mm-dia contacts

Free-Hanging Cable-Attach Receptacle

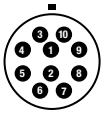
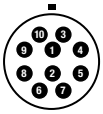
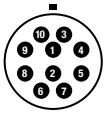
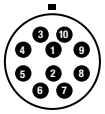
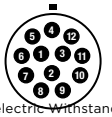
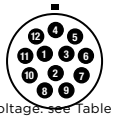
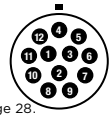




Maximum cable diameter = 6.2 mm



Contact Arrangement

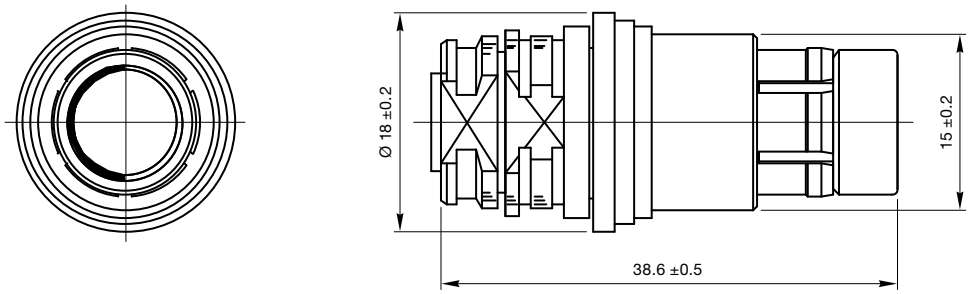
Receptacle (A) Socket Contacts	Plug (B) Pin Contacts	Receptacle (A) Pin Contacts	Plug (B) Socket Contacts	Layout Code	No. of Contacts (Contact Dia.)	Current Rating (A)	DWV*
				A	10 (0.7 mm)	3.2	II
				C B	19 (0.5 mm) 12 (0.7 mm)	1.8 3.0	III I|

*Dielectric Withstanding Voltage: see Table 2, page 28.

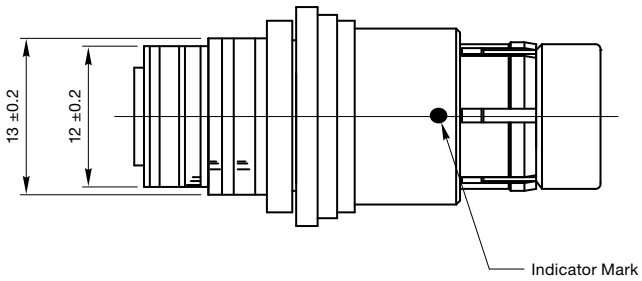
Circular HD Connectors

SHELL SERIES 4

Free-Hanging Cable-Attach Plug

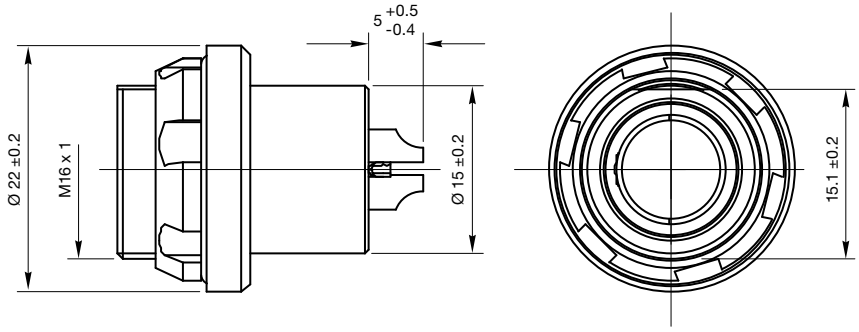


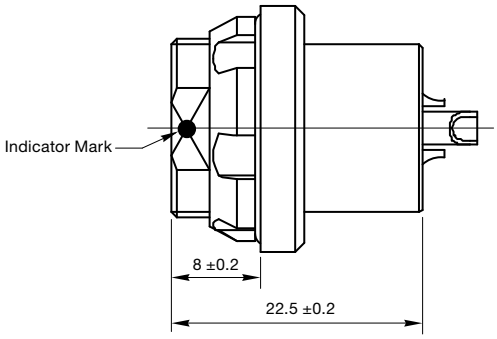
Maximum cable diameter = 8.0 mm



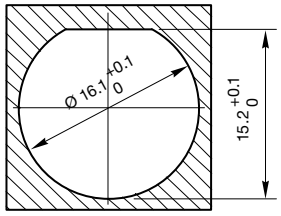
Panel-Mount Wire Termination Receptacle

Installation torque for mounting to panel: 3.5 ft-lb min.





Panel Cutout Dimensions



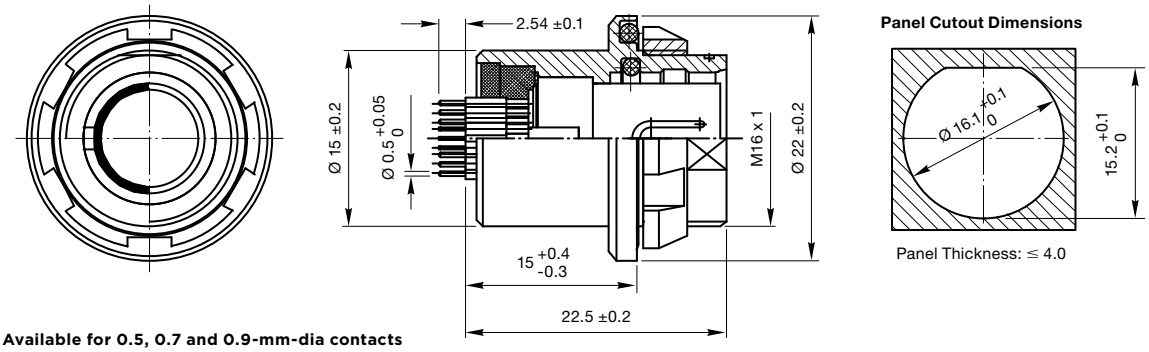
Panel Thickness: ≤ 4.0

Circular HD Connectors

SHELL SERIES 4

Panel-Mount, Board-Mount Receptacle

Installation torque for mounting to panel: 3.5 ft-lb min.

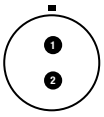
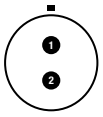
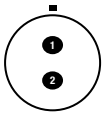
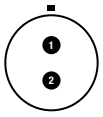
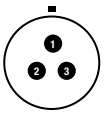
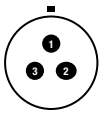
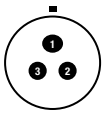
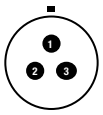
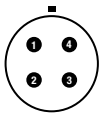
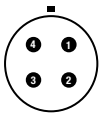
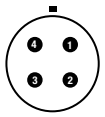
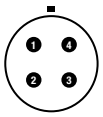
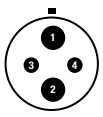
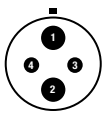
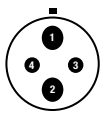
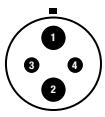
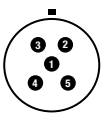
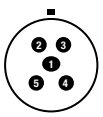
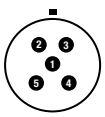
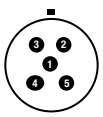
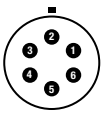
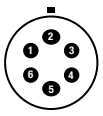
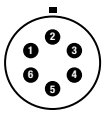
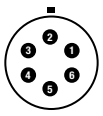
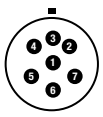
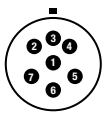
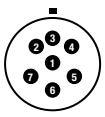
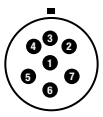
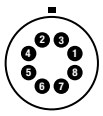
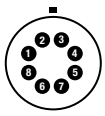
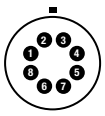
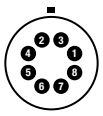
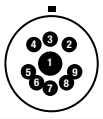
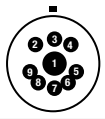
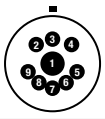
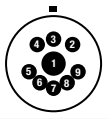
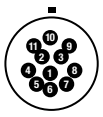
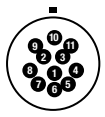
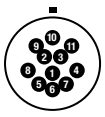
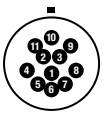


Note: Available for 0.5, 0.7 and 0.9-mm-dia contacts

Circular HD Connectors

SHELL SERIES 4

Contact Arrangement

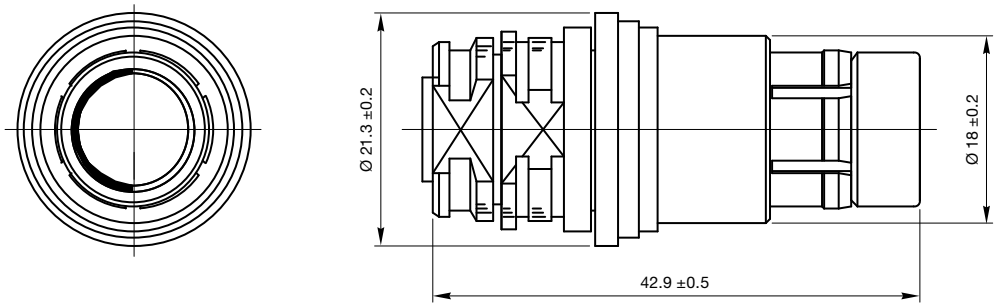
Receptacle (A) Socket Contacts	Plug (B) Pin Contacts	Receptacle (A) Pin Contacts	Plug (B) Socket Contacts	Layout Code	No. of Contacts (Contact Dia.)	Current Rating (A)	DWV*
				A	2 (1.6 mm)	15	I
				B	3 (1.6 mm)	13	I
				C	4 (1.3 mm)	8	II
				D	2 (2.3 mm) 2 (0.9 mm)	2.0 2.0	II
				E	5 (1.3 mm)	7.5	II
				F	6 (0.9 mm)	4.5	II
				G	7 (0.9 mm)	4.5	II
				H	8 (0.9 mm)	4.5	II
				I	1 (1.3 mm) 8 (0.9 mm)	8.0 4.0	II
				J	11 (0.9 mm)	4.0	II
				K	16 (0.7 mm)	2.8	III
				L	19 (0.7 mm)	2.5	III

*Dielectric Withstanding Voltage: see Table 2, page 28.

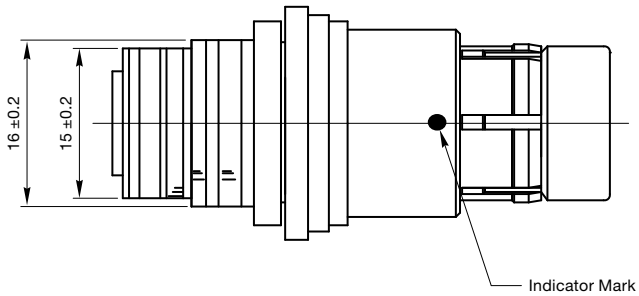
Circular HD Connectors

SHELL SERIES 5

Free-Hanging Cable-Attach Plug

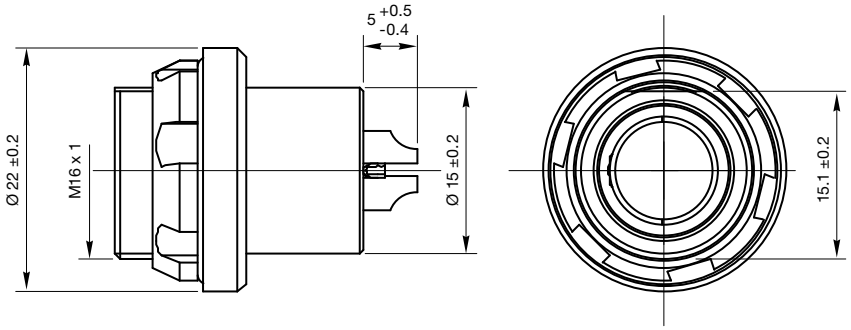


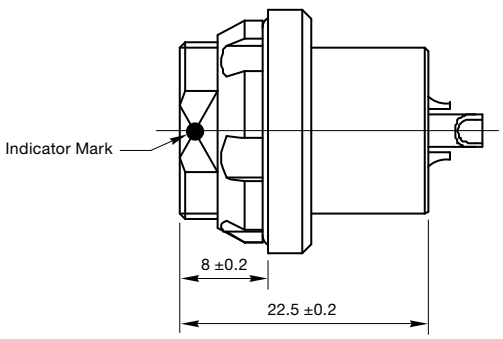
Maximum cable diameter = 10.0 mm



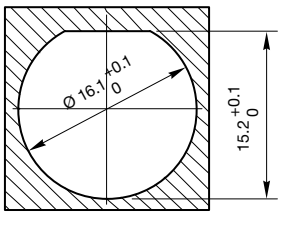
Panel-Mount Wire Termination Receptacle

Installation torque for mounting to panel: 4.0 ft-lb min.





Panel Cutout Dimensions



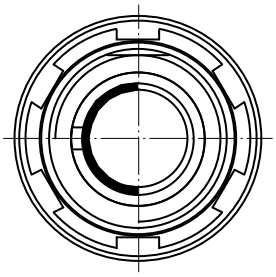
Panel Thickness: ≤ 4.0

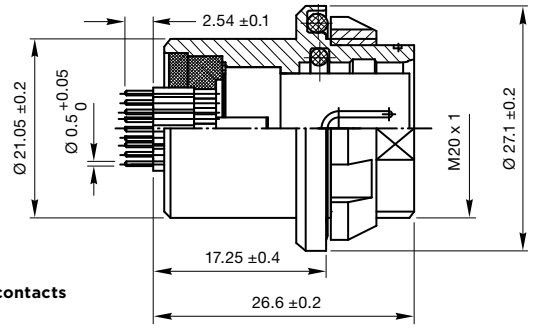
Circular HD Connectors

SHELL SERIES 5

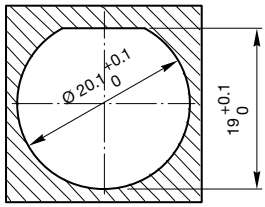
Panel-Mount, Board-Mount Receptacle

Installation torque for mounting to panel: 4.0 ft-lb min.





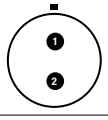
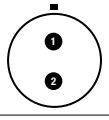
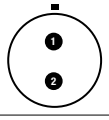
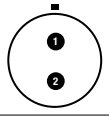
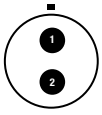
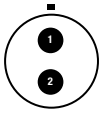
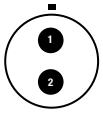
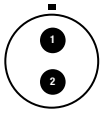
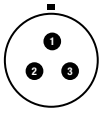
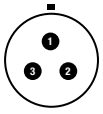
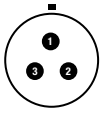
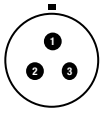
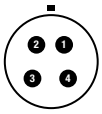
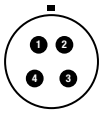
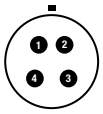
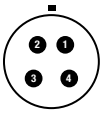
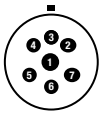
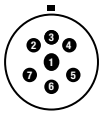
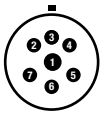
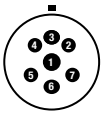
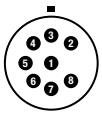
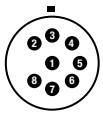
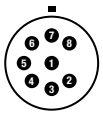
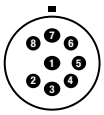
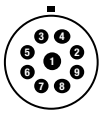
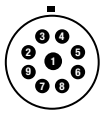
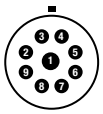
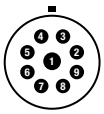
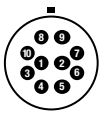
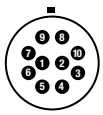
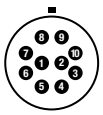
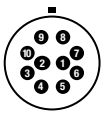
Panel Cutout Dimensions



Panel Thickness: ≤ 4.0

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

Contact Arrangement

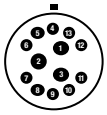
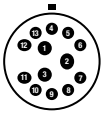
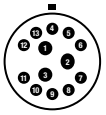
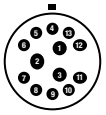
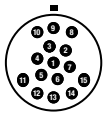
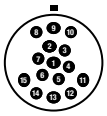
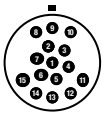
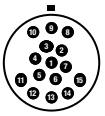
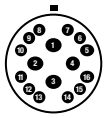
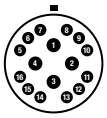
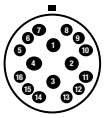
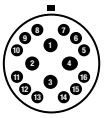
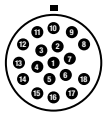
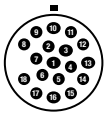
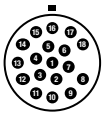
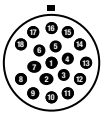
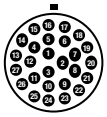
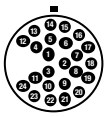
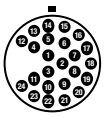
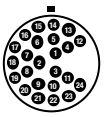
Receptacle (A) Socket Contacts	Plug (B) Pin Contacts	Receptacle (A) Pin Contacts	Plug (B) Socket Contacts	Layout Code	No. of Contacts (Contact Dia.)	Current Rating (A)	DWV*
				A	2 (2.0 mm)	18.0	I
				B	2 (3.0 mm)	20.0	I
				C	3 (2.0 mm)	16.0	I
				D	4 (2.0 mm)	14.0	II
				E	1 (2.0 mm) 6 (1.3 mm)	19.0 5.0	II
				F	8 (1.3 mm)	7.2	II
				G	1 (2.0 mm) 8 (1.3 mm)	19.0 4.0	II
				H	10 (1.3 mm)	6.3	II
				I	12 (1.3 mm)	5.5	II

*Dielectric Withstanding Voltage: see Table 2, page 28.

Circular HD Connectors

SHELL SERIES 5

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*
				J	3 (1.3 mm) 10 (0.7 mm)	10.0 1.0	II
				K	15 (0.9 mm)	2.7	II
				L	4 (1.6 mm) 12 (0.7 mm)	10.0 0.5	II
				M	18 (0.9 mm)	3.2	III
				N	27 (0.7 mm)	2.2	III
				O	24 (0.7 mm)	2.5	III
				P	40 (0.5 mm)	1.0	III
				Q	10 (0.7 mm) 27 (0.5mm)	2.2 1.0	III

*Dielectric Withstanding Voltage: see Table 2, page 28.

Circular HD Connectors

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	2157953-1	2157954-1
Series 2	2101580-1	2101579-1
Series 3	2157927-1	2157928-1
Series 4	2157929-1	2157930-1
Series 5	2101580-2	2101579-2

Circular HD Connectors

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-B-1-1	2157738-1
		7 Pos Sockets, PCB Tails, Double Key	1-B-B-E-1-2	2157951-1
		7 Pos Sockets, PCB Tails, Single Key	1-B-B-E-1-1	2157949-1
		9 Pos Sockets, PCB Tails, Double Key	1-B-B-F-1-2	2157952-1
		9 Pos Sockets, PCB Tails, Single Key	1-B-B-F-1-1	2157950-1
	Plug	3 Pos Pins, Solder Cup Tails, Single Key	1-B-P-B-2-1	2157739-1
		7 Pos Pins, Solder Cup Tails, Double Key	1-B-P-E-2-2	2157947-1
		7 Pos Pins, Solder Cup Tails, Single Key	1-B-P-E-2-1	2157945-1
		9 Pos Pins, Solder Cup Tails, Double Key	1-B-P-F-2-2	2157948-1
		9 Pos Pins, Solder Cup Tails, Single Key	1-B-P-F-2-1	2157946-1
2	Panel-Mount Receptacle	7 Pos Sockets, PCB Tails, Single Key	2-B-B-F-1-1	2101553-1
		7 Pos Sockets, PCB Tails, Double Key	2-B-B-F-1-2	2101553-2
		7 Pos Sockets, Solder Cup Tails, Single Key	2-B-A-F-1-1	2101676-1
		7 Pos Sockets, Solder Cup Tails, Double Key	2-B-A-F-1-2	2101676-2
		8 Pos Sockets, PCB Tails, Single Key	2-B-B-G-1-1	2157375-1
		8 Pos Sockets, PCB Tails, Double Key	2-B-B-G-1-2	2157375-2
		8 Pos Sockets, PCB Tails, Third Key	2-B-B-G-1-3	2157375-3
		12 Pos Sockets, PCB Tails, Double Key	2-B-B-H-1-2	2157538-2
		12 Pos Sockets, PCB Tails, Single Key	2-B-B-H-1-1	2157538-1
	Plug	7 Pos Pins, Solder Cup Tails, Single Key	2-B-P-F-2-1	2101550-1
		7 Pos Pins, Solder Cup Tails, Double Key	2-B-P-F-2-2	2101550-2
		8 Pos Pins, Solder Cup Tails, Single Key	2-B-P-G-2-1	2157376-1
		8 Pos Pins, Solder Cup Tails, Double Key	2-B-P-G-2-2	2157376-2
		8 Pos Pins, Solder Cup Tails, Third Key	2-B-P-G-2-3	2157376-3
		12 Pos Pins, Solder Cup Tails, Double Key	2-B-P-H-2-2	2157539-2
		12 Pos Pins, Solder Cup Tails, Single Key	2-B-P-H-2-1	2157539-1
4	Panel-Mount Receptacle	4 Pos Pins, Solder Cup Tails, Single Key	4-B-A-D-3-1	2157468-1
		4 Pos Pins, Solder Cup Tails, Double Key	4-B-A-D-3-2	2157468-2
		19 Pos Sockets, PCB Tails, Single Key	4-B-B-L-1-1	2157342-1
		19 Pos Sockets, Solder Cup Tails, Single Key	4-B-A-L-1-1	2157343-1
	Plug	4 Pos Sockets, Solder Cup Tails, Single Key	4-B-P-D-4-1	2157469-1
		4 Pos Sockets, Solder Cup Tails, Double Key	4-B-P-D-4-2	2157469-2
		19 Pos Pins, Solder Cup Tails, Single Key	4-B-P-L-2-1	2157344-1
5	Panel-Mount Receptacle	40 Pos Sockets, PCB Tails, Single Key	5-B-B-P-1-1	2101549-1
		40 Pos Sockets, Solder Cup Tails, Single Key	5-B-A-P-1-1	2101677-1
		40 Pos, Sockets, PCB Tails, Double Key	5-B-B-P-1-2	2101549-2
		40 Pos, Sockets, Solder Cup Tails, Double Key	5-B-A-P-1-2	2101677-2
	Plug	40 Pos Pins, Solder Cup Tails, Double Key	5-B-P-P-2-2	2101551-2
		40 Pos Pins, Solder Cup Tails, Single Key	5-B-P-P-2-1	2101551-1