

***Thomas & Betts***

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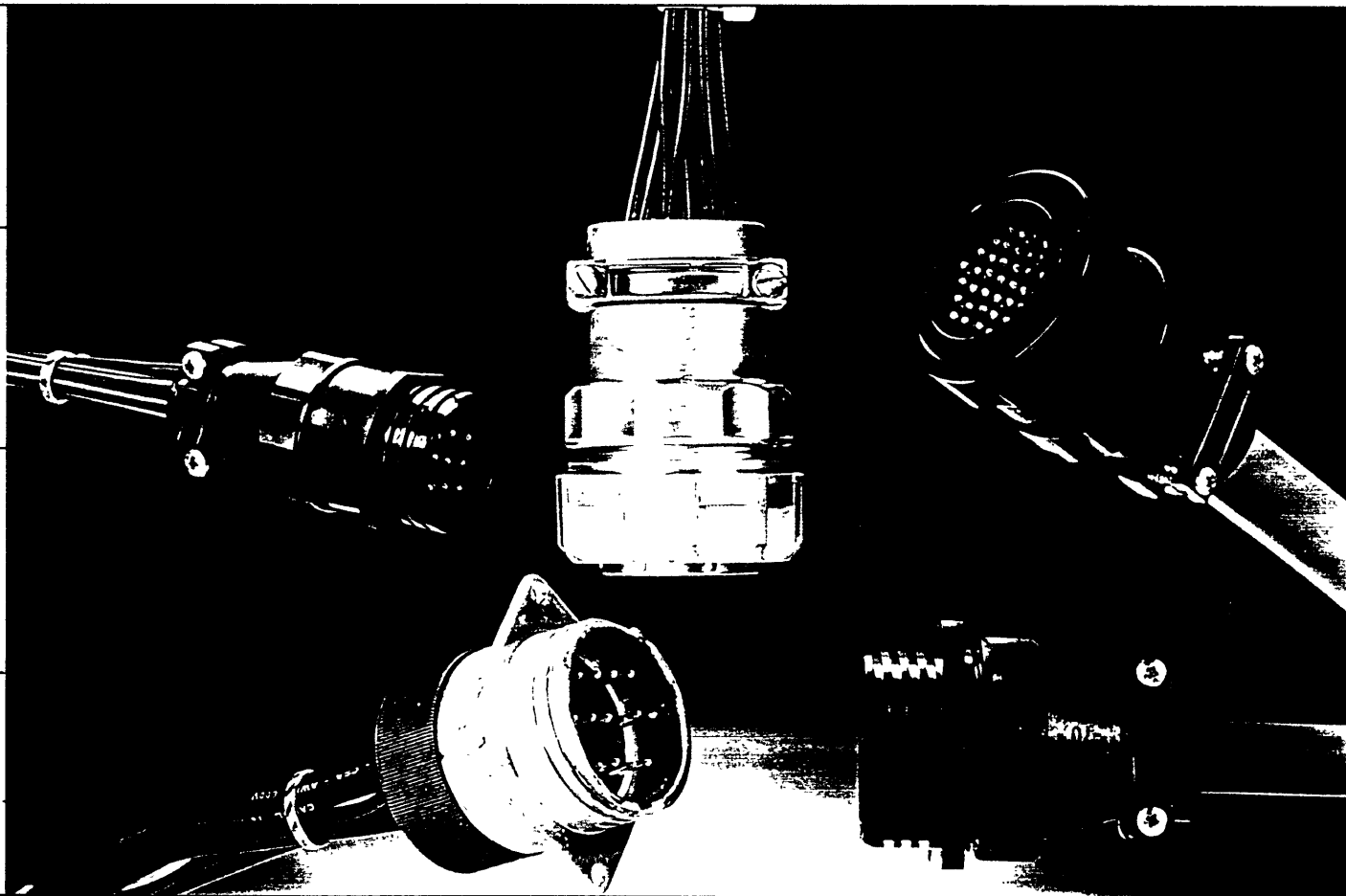
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TRIAD™  
Circular Connectors

240-564

To

241-260



**PRODUCT DESCRIPTION**

**TRIAD™ 10 Circular Plastic Connector** offers all moulded plugs and receptacles in three shell sizes and five different contact arrangements as standard. Thus, providing the user with reductions in installed cost and weight for applications, where the traditional metal-shell is not required.

Both front shell plugs and receptacles are available in versions accepting either pin or socket contact. The receptacle will also accept a sealing ring for environmental sealing. A modified ACME thread assists coupling and uncoupling of plugs and receptacles and provides an anti-vibration lock.

Two backshell styles are available. One has a two screw clamp that accepts a wide range of cables or discrete wires, the other incorporates a heat shrink boot arrangement for jacketed cables.

**TRIAD™ 20 Circular Metal Shell Connectors** has many of the circular plastic connector features, plus the added benefit of a heavy duty metal shell for increased durability and shielding effectiveness. Die cast zinc parts are coated for protection against harsh industrial environments. A modified ACME thread assists coupling and uncoupling of plugs and receptacles and provides an anti-vibration lock.

The contact housing inserts for both frontshell plugs and receptacles are moulded from glass filled thermoplastic rated at 105°C. They are also provided with a selection of multiple keying positions. This feature expands the number of available contact configurations and can eliminate the possibility of cross-mating the connectors.

A watertight backshell providing sealing to IP65 is available.

**Contacts** are precision stamped and formed from copper alloy and are available with gold or tin plate finishes.

Crimp style contacts are available to cover a range of wire conductor sizes from 0.25mm<sup>2</sup> to 2.5mm<sup>2</sup>.

Solder-pin contacts are also available which allow TRIAD™ connectors to be mounted directly to p.c.bs and flexi-circuits.

**Accessories**, these include backshells, conduit adaptors, gaskets, sealing rings, dust caps, backshell extenders, keying pins and 90° adaptors.

**Approvals.**

U.L. recognised for 250 Volt Service. File No. E15163.

CSA Certified. File No. LR84472.

**Caution**, these connectors are not intended for connecting or disconnecting under load conditions.



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**IMPORTANT:** Thomas & Betts shall have no liability for any loss, costs or damages incurred by the user in the event of misuse of this product or failure to follow all instructions. This exclusion of liability is in addition to all other limitations and exclusions of liability contained in Thomas & Betts Standard Warranty statement.

**STANDARD WARRANTY:** Thomas & Betts manufactures its goods and tools in a manner to be free of defects. Should any defect occur and be promptly notified within 90 days (in the case of tools) or two years (in the case of other goods) from the date of delivery by Thomas & Betts, it will, at its option, either exchange or repair the tools or other goods or refund the purchase price.

**LIMITATION AND EXCLUSIONS:** This warranty is in lieu of all other representations and expressed and implied warranties and conditions statutory or otherwise (including the implied warranties of merchantability and fitness for purpose) and under no circumstances shall Thomas & Betts be liable for any incidental or consequential damages or loss. This shall not, however, apply to death or personal injury resulting from the negligence of Thomas & Betts.

**PERFORMANCE**

<b>Test Description</b>	<b>Procedure</b>	<b>Requirement</b>
<b>Contact Retention</b>	A load is applied axially on the contact to push it to the rear of the receptacle or plug.	A minimum of 10 lbs. per contact and a minimum 15 lbs. average for all contacts.
<b>Dielectric withstanding Voltage</b>	Mil. Std. – 1344A Method 3001.1	No breakdown or flashover below 1500 volts.
<b>High Frequency Vibration</b>	Per Mil. Std. 202F Method 204D, Test Condition B. Contacts wired in series with 100 milliamperes flowing during the test.	No loosening of parts, maximum of ten micro-second of interruption is allowed.
<b>Mechanical Shock</b>	Mil. Std. 202F Method 213A, Test condition A. Peak value – 50 G's. Contacts wired in series with 100 milliamperes flowing during the test.	No damage. No interruption of current longer than 10 microseconds.
<b>Thermal Shock</b>	Mated connectors subjected to five cycles of temperature cycling between –55 and +105 degrees centigrade.	No damage. Performance remains within specification.
<b>Temperature Life</b>	Mated connectors exposed to 105 degrees centigrade for 200 hours.	No damage. Performance remains within specification.
<b>Corrosion</b>	Salt spray per Mil. Std. 202 Method 101, Test condition B.	No damage.
<b>Insulation Resistance</b>	Mil. Std. 1344, Method 3003. Resistance measured between adjacent contacts.	Minimum of 5000 megaohms at ambient temperature.
<b>Weatherproof</b>	A water spray is applied in accordance with IP65.	No ingress of moisture to be detected. Remains within specification.

**TECHNICAL DATA**

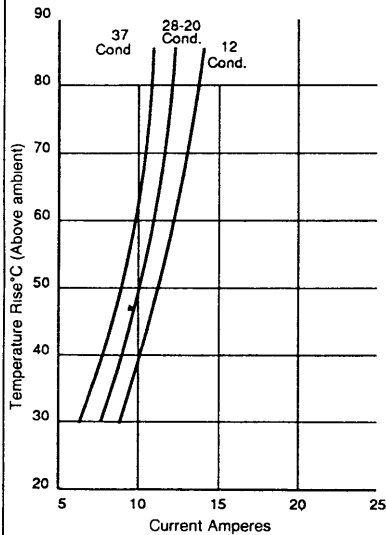
**Electrical:**  
250 Volts  
13 Amps in free air each contact

Operating Temperature:  
105°C maximum

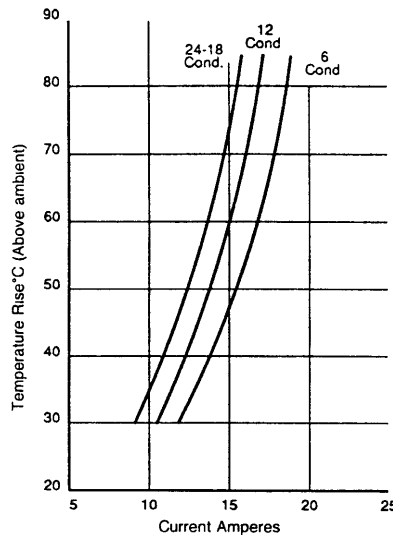
**Materials:**  
TRIAD™ 10 Plug and Receptacle bodies, Cable clamp backshells and sealing caps.  
TRIAD™ 20 Inserts and Insert retainers manufactured from:-  
*Glass filled thermoplastic rated at 105°C. Self-extinguishing class per UL 94V-1.*

TRIAD™ 20 Plug and Receptacle bodies, Cable clamp backshells manufactured from:-  
*die cast zinc finished with chromate over zinc plating.*  
TRIAD™ 20 Insert retainer seals and back shell "O" sealing rings are made from – *Buna N nitrile rubber.*

**TRIAD™ 10 CIRCULAR PLASTIC CONNECTOR**



Shell size 23  
Circuits 37  
Wire size 1,5mm<sup>2</sup>



Shell size 23  
Circuits 24  
Wire size 2,50mm<sup>2</sup>

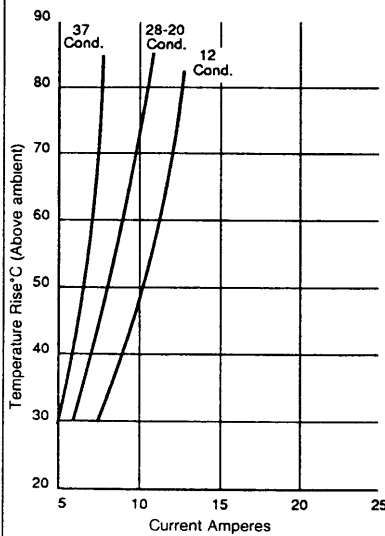
Caution must be taken to ensure that within any TRIAD™ 10-20 Circular Connector the current carrying capacity is limited, in order to prevent the internal temperature exceeding the rated temperature of the connector housing material. The current capacity of each contact is dependant on the temperature rise caused by electrical load of all the contacts and the maximum ambient temperature in which the connector will be operating.

Key factors which govern connector temperature rise are:-

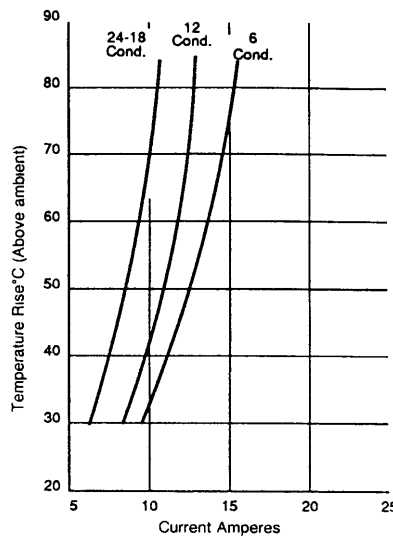
- a) NO. OF CIRCUITS-  
in general the more circuits in use will reduce the current rating per contact.
- b) WIRE SIZE-  
larger wire sizes will carry more current and generate less heat.
- c) AMBIENT TEMPERATURE-  
the higher the temperature the lower the current capacity.

The graphs show how the above affect the current carrying capacity of the connector and may serve as a guide to connector selection.

**TRIAD™ 20 CIRCULAR METAL SHELL CONNECTOR**

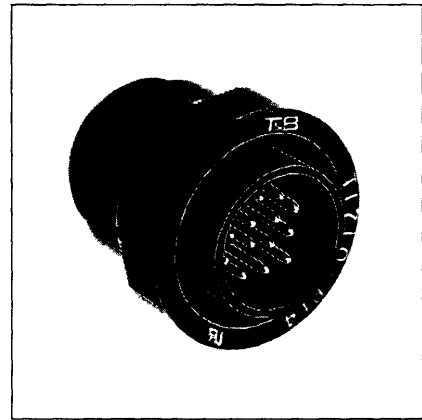


Shell size 23  
Circuits 37  
Wire size 0,5mm<sup>2</sup>

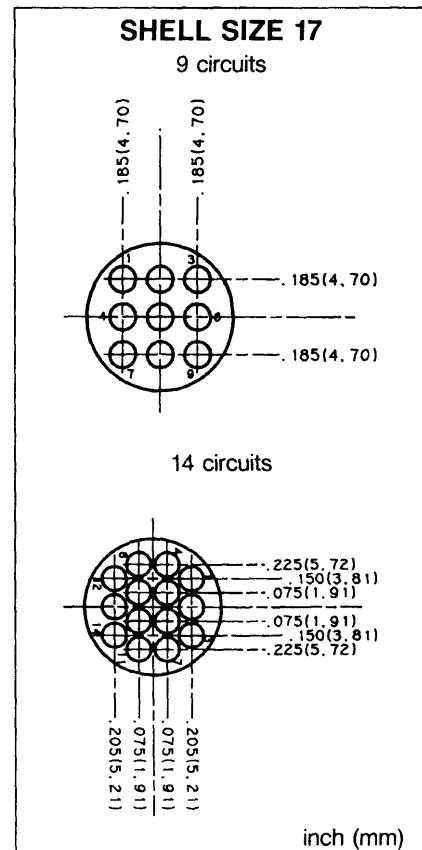
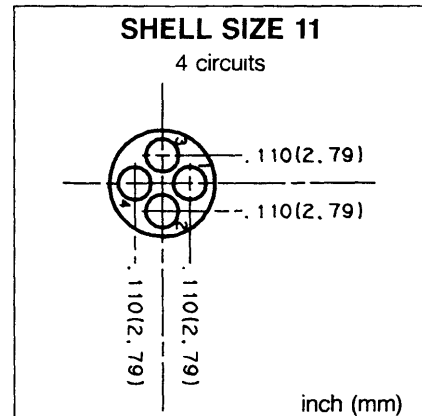
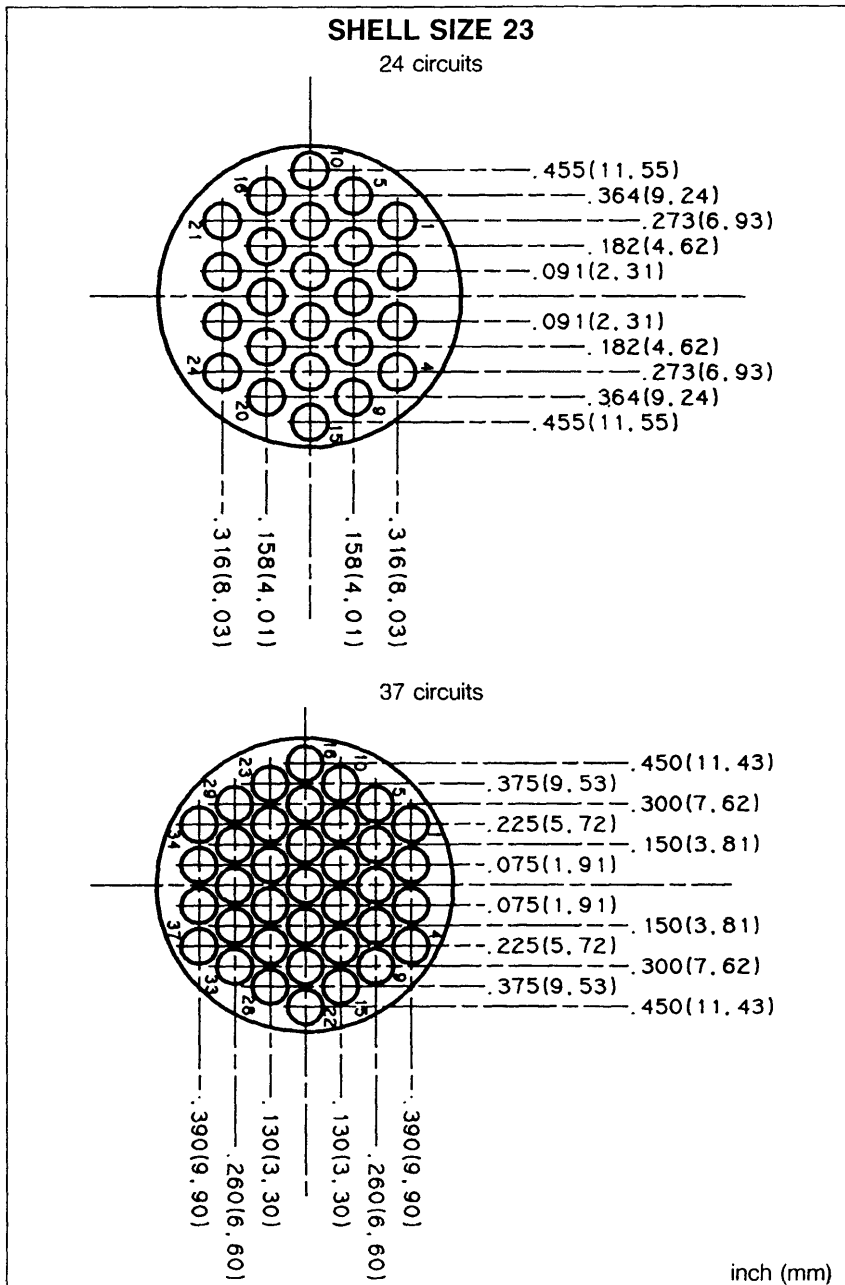


Shell size 23  
Circuits 24  
Wire size 0,75mm<sup>2</sup>

Shell Size	No. of Circuits	Maximum Wire Insulation Diameter	
		mm	inch
11	4	3.20	0.126
17	9	4.00	0.158
17	14	3.20	0.126
23	24	4.00	0.158
23	37	3.20	0.126



Pin views shown. Socket views are mirror images.

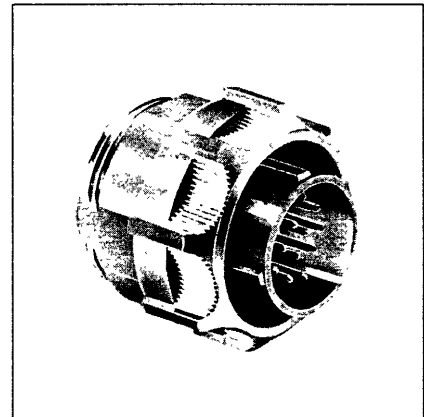


**PRODUCT DESCRIPTION**

**TRIAD™ 20 Insert keying** this range of connectors incorporates a unique keying feature between the metal-shell and the thermoplastic insert. This feature expands the number of available contact configurations and can eliminate the possibility of cross-mating the connectors. The primary key position is also indicated on the outside of the metal-shell for easy reference.

The diagrams below indicate the number of keying positions available between the metal-shell and the insert. Also, the minimum contact positions to be used, in order to provide complete security. A pin or socket contact can be substituted with keying pin T9KP16.

Contact arrangement and dimensional positioning is the same as TRIAD™ 10 Circular Plastic Connector and is detailed on page 4.



**SHELL SIZE 11**  
4 circuits

Key Positions: 2  
Min. Contacts: Any two

**SHELL SIZE 17**  
9 circuits

Key Positions: 3  
Min. Contacts: 1, 5, 9

14 circuits

Key Positions: 2  
Min. Contacts: 1, 3, 12, 14

**SHELL SIZE 23**  
24 circuits

Key Positions: 5  
Min. Contacts: 1, 4, 10, 15, 21, 24

37 circuits

Key Positions: 5  
Min. Contacts: 1, 4, 16, 19, 22, 34, 37

Pin views shown.  
Socket views are mirror images.

**PRODUCT DESCRIPTION**

**TRIAD™ 10 Plug Front Shell Assemblies** are moulded from glass filled thermoplastic with a flammability rating per UL Class 94V-1. They are designed to suit either pin or socket contacts, as shown below and are available in three shell sizes and five contact arrangements, as detailed on page 4. Operating temperature 105°C maximum.

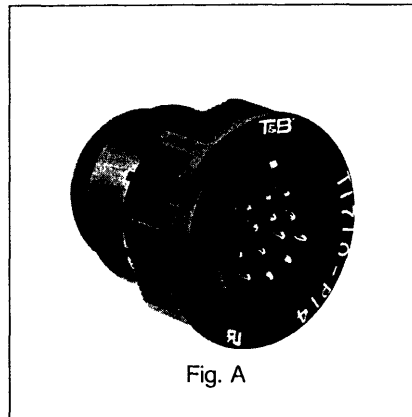


Fig. A

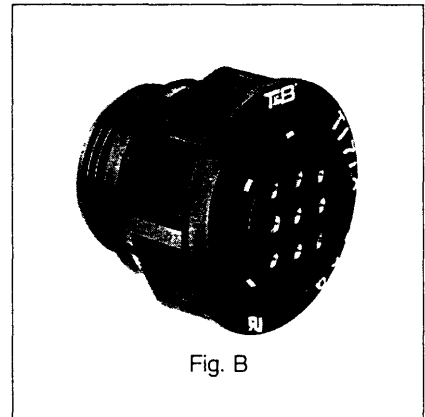
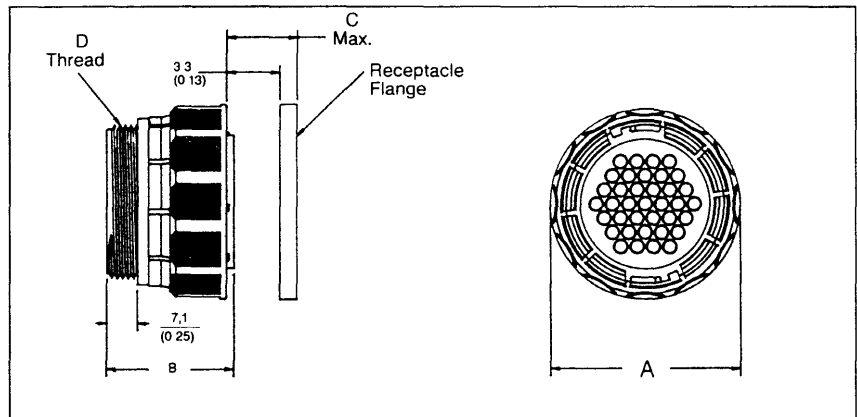


Fig. B



**TRIAD™ 10 PLUG FRONT SHELL ASSEMBLIES FOR PIN CONTACTS (Fig. A)**

Cat. No.	Shell size	No. of Circuits	Dimensions in mm (inch)			
			A	B	C	D
T1110-P04	11	4	25,4 (1.00)	34,0 (1.34)	6,4 (0.25)	5/8-24
T1710-P09	17	9	34,5 (1.36)	34,0 (1.34)	6,4 (0.25)	15/16-20
T1710-P14	17	14	34,5 (1.36)	34,0 (1.34)	6,4 (0.25)	15/16-20
T2310-P24	23	24	44,5 (1.75)	34,0 (1.34)	8,1 (0.32)	1 3/8-18
T2310-P37	23	37	44,5 (1.75)	34,0 (1.34)	8,1 (0.32)	1 3/8-18

**TRIAD™ 10 PLUG FRONT SHELL ASSEMBLIES FOR SOCKET CONTACTS (Fig. B)**

Cat. No.	Shell size	No. of Circuits	Dimensions in mm (inch)			
			A	B	C	D
T1110-S04	11	4	25,4 (1.00)	29,0 (1.14)	6,4 (0.25)	5/8-24
T1710-S09	17	9	34,5 (1.36)	29,0 (1.14)	6,4 (0.25)	15/16-20
T1710-S14	17	14	34,5 (1.36)	29,0 (1.14)	6,4 (0.25)	15/16-20
T2310-S24	23	24	44,5 (1.75)	29,0 (1.14)	8,1 (0.32)	1 3/8-18
T2310-S37	23	37	44,5 (1.75)	29,0 (1.14)	8,1 (0.32)	1 3/8-18



**PRODUCT DESCRIPTION**

**TRIAD™ 10 Panel Mount Receptacles** are moulded from glass filled thermoplastic with a flammability rating per UL Class 94V-1. They are designed to suit either pin or socket contacts, as shown below and are available in three shell sizes and five contact arrangements, as detailed on Page 4.

The receptacles may be mounted inside or outside panels. For inside panel mounting the maximum panel thickness is 3,2 mm (.125").

Additionally, receptacles are designed to accept an optional sealing ring for environmental sealing.

Operating temperature range 105°C maximum.

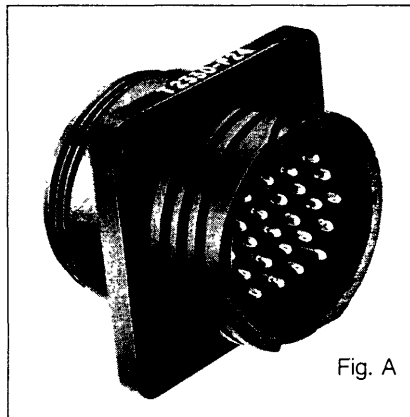


Fig. A

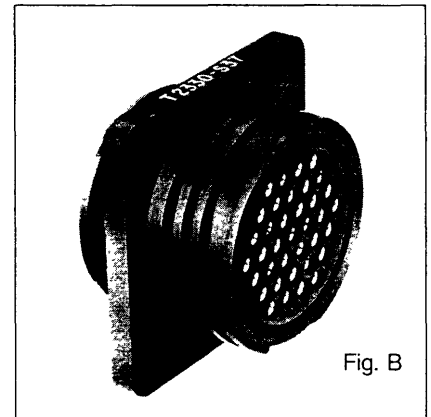
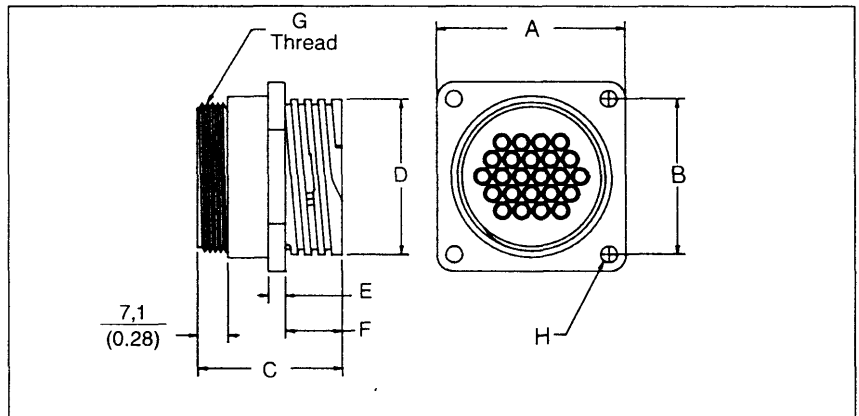


Fig. B



**TRIAD™ 10 PANEL MOUNT RECEPTACLES FOR PIN CONTACTS (Fig A.)**

Cat. No.	Shell size	No. of Circuits	Panel cut-out Ø mm (inch)	Dimensions in mm (inch)							
				A	B	C	D	E	F	G	H
T1130-P04	11	4	20,7 (0.82)	28,7 (1.13)	21,3 (0.84)	33,8 (1.33)	17,5 (0.69)	2,3 (.09)	10,7 (.42)	5/8-24	3,3 (.13)
T1730-P09	17	9	32,13 (1.27)	36,6 (1.44)	28,7 (1.13)	33,8 (1.33)	26,7 (1.05)	2,3 (.09)	10,7 (.42)	15/16-20	3,8 (.15)
T1730-P14	17	14	32,13 (1.27)	36,6 (1.44)	28,7 (1.13)	33,8 (1.33)	26,7 (1.05)	2,3 (.09)	10,7 (.42)	15/16-20	3,8 (.15)
T2330-P24	23	24	38,6 (1.52)	44,5 (1.75)	36,6 (1.44)	33,8 (1.33)	36,3 (1.43)	4,1 (.16)	13,5 (.53)	1 3/8-18	3,8 (.15)
T2330-P37	23	37	38,6 (1.52)	44,5 (1.75)	36,6 (1.44)	33,8 (1.33)	36,3 (1.43)	4,1 (.16)	13,5 (.53)	1 3/8-18	3,8 (.15)

**TRIAD™ 10 PANEL MOUNT RECEPTACLES FOR SOCKET CONTACTS (Fig B.)**

Cat. No.	Shell size	No. of Circuits	Panel cut-out Ø mm (inch)	Dimensions in mm (inch)							
				A	B	C	D	E	F	G	H
T1130-S04	11	4	20,7 (0.82)	28,7 (1.13)	21,3 (0.84)	26,9 (1.06)	17,5 (0.69)	2,3 (.09)	10,7 (.42)	5/8-24	3,3 (.13)
T1730-S09	17	9	32,13 (1.27)	36,6 (1.44)	28,7 (1.13)	26,9 (1.06)	26,7 (1.05)	2,3 (.09)	10,7 (.42)	15/16-20	3,8 (.15)
T1730-S14	17	14	32,13 (1.27)	36,6 (1.44)	28,7 (1.13)	26,9 (1.06)	26,7 (1.05)	2,3 (.09)	10,7 (.42)	15/16-20	3,8 (.15)
T2330-S24	23	24	38,6 (1.52)	44,5 (1.75)	36,6 (1.44)	26,9 (1.06)	36,3 (1.43)	4,1 (.16)	13,5 (.53)	1 3/8-18	3,8 (.15)
T2330-S37	23	37	38,6 (1.52)	44,5 (1.75)	36,6 (1.44)	26,9 (1.06)	36,3 (1.43)	4,1 (.16)	13,5 (.53)	1 3/8-18	3,8 (.15)

**PRODUCT DESCRIPTION**

**TRIAD™ 10 Cable Mount Receptacles** are designed for use with plug front shell assemblies in cable extension applications. They are similar in construction to the panel mount receptacles, except for the exclusion of the mounting flange.

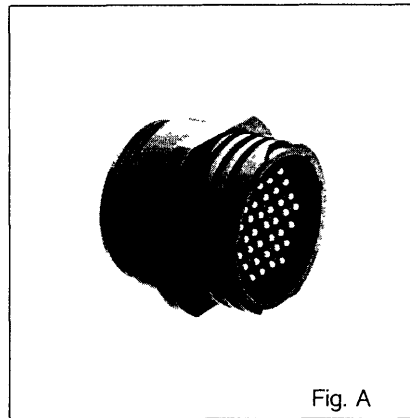


Fig. A

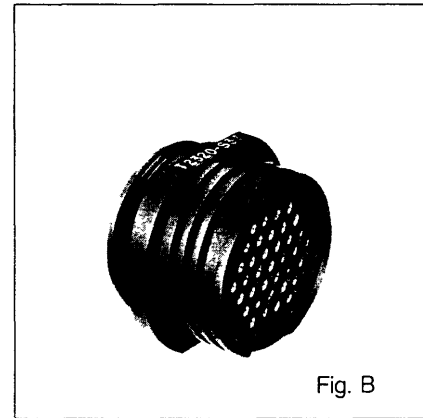
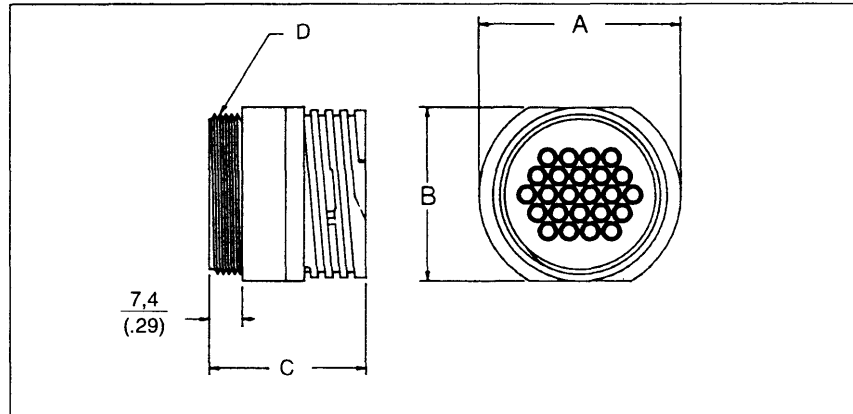


Fig. B



**TRIAD™ 10 CABLE MOUNT RECEPTACLES FOR PIN CONTACTS (Fig. A)**

Cat. No.	Shell size	No. of Circuits	Dimensions in mm (inch)			
			A	B	C	D
T1120-P04	11	4	23,6 (0.93)	20,6 (.81)	33,8 (1.33)	5/8-24
T1720-P09	17	9	33,3 (1.31)	29,5 (1.16)	33,8 (1.33)	15/16-20
T1720-P14	17	14	33,3 (1.31)	29,5 (1.16)	33,8 (1.33)	15/16-20
T2320-P24	23	24	43,9 (1.73)	37,8 (1.49)	33,8 (1.33)	1 3/8-18
T2320-P37	23	37	43,9 (1.73)	37,8 (1.49)	33,8 (1.33)	1 3/8-18

**TRIAD™ 10 CABLE MOUNT RECEPTACLES FOR SOCKET CONTACTS (Fig. B)**

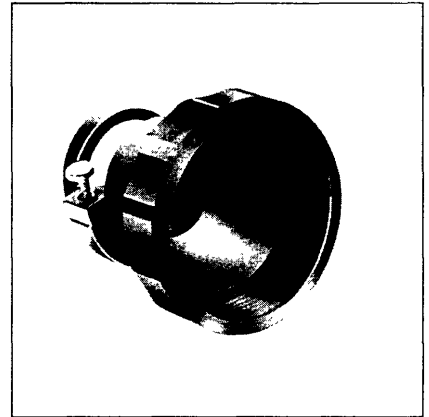
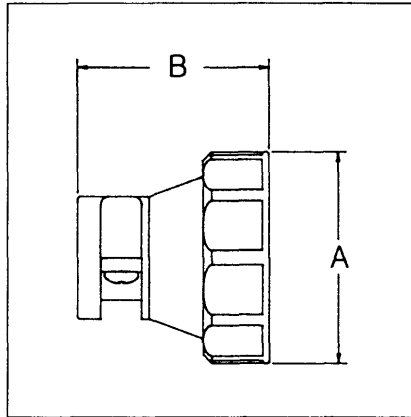
Cat. No.	Shell size	No. of Circuits	Dimensions in mm (inch)			
			A	B	C	D
T1120-S04	11	4	23,6 (0.93)	20,6 (.81)	26,9 (1.06)	5/8-24
T1720-S09	17	9	33,3 (1.31)	29,5 (1.16)	26,9 (1.06)	15/16-20
T1720-S14	17	14	33,3 (1.31)	29,5 (1.16)	26,9 (1.06)	15/16-20
T2320-S24	23	24	43,9 (1.73)	37,8 (1.49)	26,9 (1.06)	1 3/8-18
T2320-S37	23	37	43,9 (1.73)	37,8 (1.49)	26,9 (1.06)	1 3/8-18

**PRODUCT DESCRIPTION**

**TRIAD™ 10 Back Shell, Cable Clamps** are for use with cable or discrete wire harnesses and are range taking in design. They are screwed quickly and easily onto the appropriate TRIAD™ 10 Front Shell, Plug or Receptacle assembly.

**Material:**

Moulded in glass filled thermoplastic, self-extinguishing per UL94V-1 and rated at 105°C maximum.



**TRIAD™ 10 BACK SHELL CABLE CLAMP**

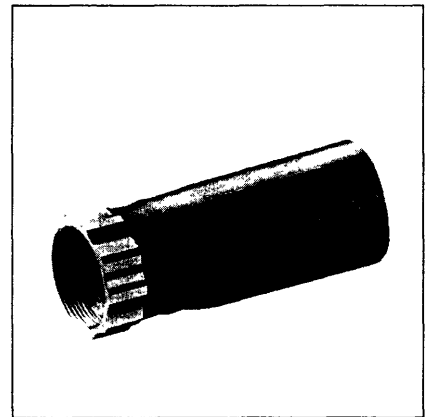
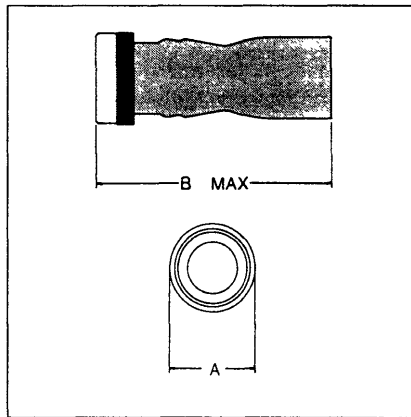
Cat. No.	Dimensions mm (inch)		
	A	B	Cable Dia. Range
T118SR-33	23,1 (.91)	31,8 (1.25)	2,8- 8,4 (.11- .33)
T118SR-45	23,1 (.91)	35,6 (1.40)	2,8-11,4 (.11- .45)
T178SR-45	29,5 (1.16)	35,6 (1.40)	2,8-11,4 (.11- .45)
T178SR-70	29,5 (1.16)	41,9 (1.65)	8,6-17,8 (.34- .70)
T238SR-70	40,6 (1.60)	39,4 (1.55)	8,6-17,8 (.34- .70)
T238SR-112	40,6 (1.60)	41,9 (1.65)	14,5-28,4 (.57-1.12)

**PRODUCT DESCRIPTION**

**TRIAD™ 10 Back Shell, Cable Entry Seal** comprise of a threaded ring to suit the appropriate TRIAD™ 10 Front Shell, Plug or Receptacle assembly, and a heat shrink boot. Used specifically with jacketed cable, the heat shrink boot provides an environmental seal.

**Material:**

Front Section anodised aluminium  
Heat shrink boot, polyolefin rated at 90°C



**TRIAD™ 10 BACK SHELL CABLE ENTRY SEAL**

Cat. No.	Dimensions mm (inch)		
	A	B	Cable Dia. Range
T118ES-26	22,4 (.88)	71,4 (2.81)	6,6-15,2 (.26- .60)
T178ES-40	33,3 (1.31)	79,2 (3.12)	10,2-22,4 (.40- .88)
T238ES-55	41,4 (1.63)	88,9 (3.50)	14,0-27,9 (.55-1.10)

**PRODUCT DESCRIPTION**

**TRIAD™ 20 Plug Front Shell Assemblies** comprise of die-cast zinc body and removable glass filled thermoplastic insert for pin or socket contact retention, as detailed below. They are available in three shell sizes and five contact arrangements. As shown on page 5 alternative keying is possible by simply repositioning the insert. If back shell are not required, then the appropriate size Insert Retainer, as shown on page 20 must be used to retain the Insert.

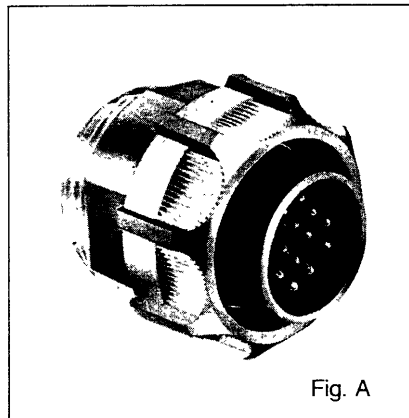


Fig. A

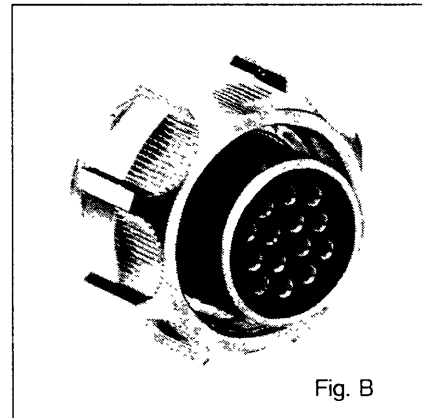
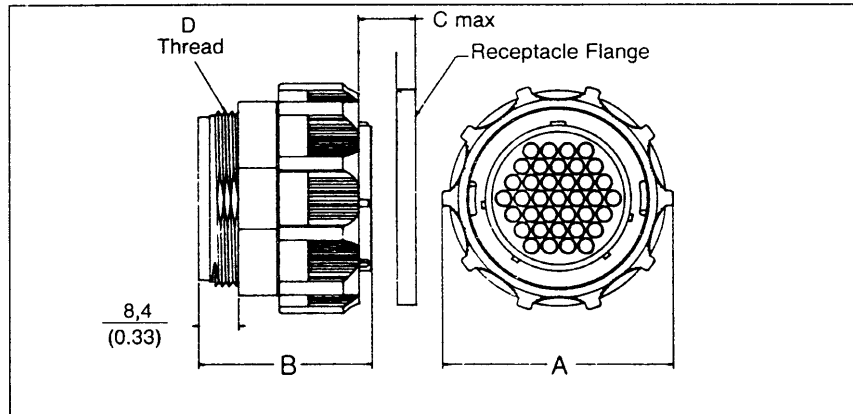


Fig. B



**TRIAD™ 20 PLUG FRONT SHELL ASSEMBLIES FOR PIN CONTACTS (Fig. A)**

Cat. No.	Shell size	No. of Circuits	Dimensions in mm (inch)			
			A	B	C	D
M1110-P04	11	4	28,7 (1.13)	35,8 (1.41)	6,4 (.25)	3/4-20
M1710-P09	17	9	38,1 (1.50)	35,8 (1.41)	6,4 (.25)	1 3/16-18
M1710-P14	17	14	38,1 (1.50)	35,8 (1.41)	6,4 (.25)	1 3/16-18
M2310-P24	23	24	48,0 (1.89)	35,8 (1.41)	8,1 (.32)	1 7/16-18
M2310-P37	23	37	48,0 (1.89)	35,8 (1.41)	8,1 (.32)	1 7/16-18

**TRIAD™ 20 PLUG FRONT SHELL ASSEMBLIES FOR SOCKET CONTACTS (Fig. B)**

Cat. No.	Shell size	No. of Circuits	Dimensions in mm (inch)			
			A	B	C	D
M1110-S04	11	4	28,7 (1.13)	29,5 (1.16)	6,4 (.25)	3/4-20
M1710-S09	17	9	38,1 (1.50)	29,5 (1.16)	6,4 (.25)	1 3/16-18
M1710-S14	17	14	38,1 (1.50)	29,5 (1.16)	6,4 (.25)	1 3/16-18
M2310-S24	23	24	48,0 (1.89)	29,5 (1.16)	8,1 (.32)	1 7/16-18
M2310-S37	23	37	48,0 (1.89)	29,5 (1.16)	8,1 (.32)	1 7/16-18

**PRODUCT DESCRIPTION**

**TRIAD™ 20 Panel Mount Receptacles** also comprises a die-cast zinc body and removable glass filled thermoplastic insert for pin or socket retention as detailed below. All metal-shell receptacles are fitted with a sealing ring. The receptacles may be mounted inside or outside panels. For inside panel mounting maximum panel thickness is 3,2 mm (.125"). As with TRIAD™ 20 Plugs the receptacles are also available in three shell sizes, five contact configurations and optionally keying facility. An insert retainer is also provided, which is discarded if backshells are used.

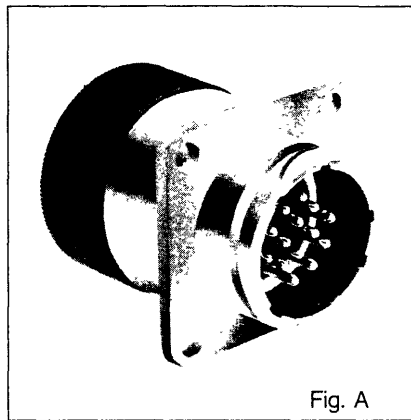


Fig. A

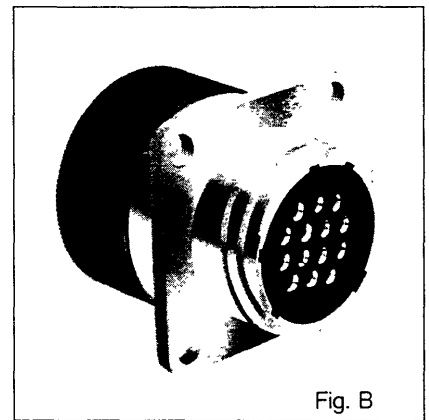
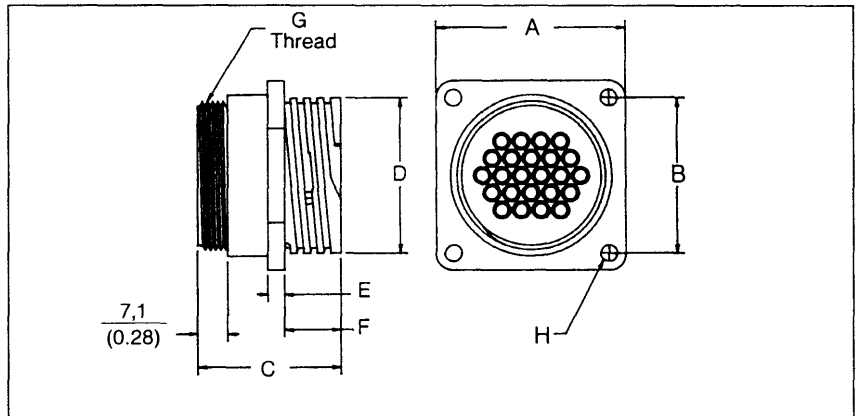


Fig. B



**TRIAD™ 20 PANEL MOUNT RECEPTACLES FOR PIN CONTACTS (Fig A.)**

Cat. No.	Shell Size	No. of Circuits	Panel Cut-out Ø mm (inch)	Dimensions in mm (inch)							
				A	B	C	D	E	F	G	H
M1131-P04	11	4	20,7 (0.82)	28,7 (1.13)	21,3 (0.84)	35,8 (1.41)	17,5 (0.69)	2,3 (.09)	11,4 (.45)	3/4-20	3,3 (.13)
M1731-P09	17	9	32,13 (1.27)	36,6 (1.44)	28,7 (1.13)	35,8 (1.41)	26,7 (1.05)	2,3 (.09)	11,4 (.45)	19/16-18	3,8 (.15)
M1731-P14	17	14	32,13 (1.27)	36,6 (1.44)	28,7 (1.13)	35,8 (1.41)	26,7 (1.05)	2,3 (.09)	11,4 (.45)	19/16-18	3,8 (.15)
M2331-P24	23	24	38,6 (1.52)	44,5 (1.75)	36,6 (1.44)	35,8 (1.41)	36,3 (1.43)	2,3 (.09)	13,5 (.53)	17/16-18	3,8 (.15)
M2331-P37	23	37	38,6 (1.52)	44,5 (1.75)	36,6 (1.44)	35,8 (1.41)	36,3 (1.43)	2,3 (.09)	13,5 (.53)	17/16-18	3,8 (.15)

**TRIAD™ 20 PANEL MOUNT RECEPTACLES FOR SOCKET CONTACTS (Fig B.)**

Cat. No.	Shell Size	No. of Circuits	Panel Cut-out Ø mm (inch)	Dimensions in mm (inch)							
				A	B	C	D	E	F	G	H
M1131-S04	11	4	20,7 (0.82)	28,7 (1.13)	21,3 (0.84)	29,5 (1.16)	17,5 (0.69)	2,3 (.09)	11,4 (.45)	3/4-20	3,3 (.13)
M1731-S09	17	9	32,13 (1.27)	36,6 (1.44)	28,7 (1.13)	29,5 (1.16)	26,7 (1.05)	2,3 (.09)	11,4 (.45)	19/16-18	3,8 (.15)
M1731-S14	17	14	32,13 (1.27)	36,6 (1.44)	28,7 (1.13)	29,5 (1.16)	26,7 (1.05)	2,3 (.09)	11,4 (.45)	19/16-18	3,8 (.15)
M2331-S24	23	24	38,6 (1.52)	44,5 (1.75)	36,6 (1.44)	29,5 (1.16)	36,3 (1.43)	2,3 (.09)	13,5 (.53)	17/16-18	3,8 (.15)
M2331-S37	23	37	38,6 (1.52)	44,5 (1.75)	36,6 (1.44)	29,5 (1.16)	36,3 (1.43)	2,3 (.09)	13,5 (.53)	17/16-18	3,8 (.15)

**PRODUCT DESCRIPTION**

**TRIAD™ 20 Cable Mount Receptacles** are designed for use with plug front shell assemblies in cable extension applications. They are similar in construction to the panel mount receptacles, except for the exclusion of the mounting flange. They are also supplied with a self contained environmental seal. If back shells are not required, then the appropriate size insert retainer, as shown on page 20 must be used to retain the insert.

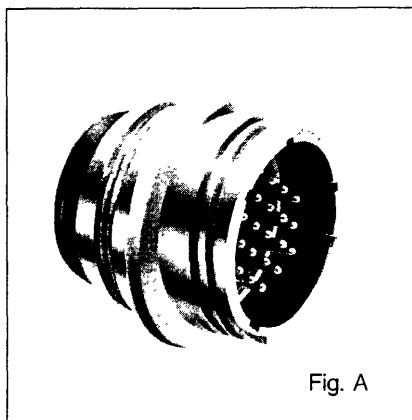


Fig. A

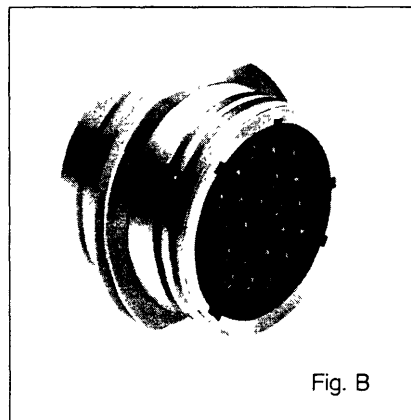
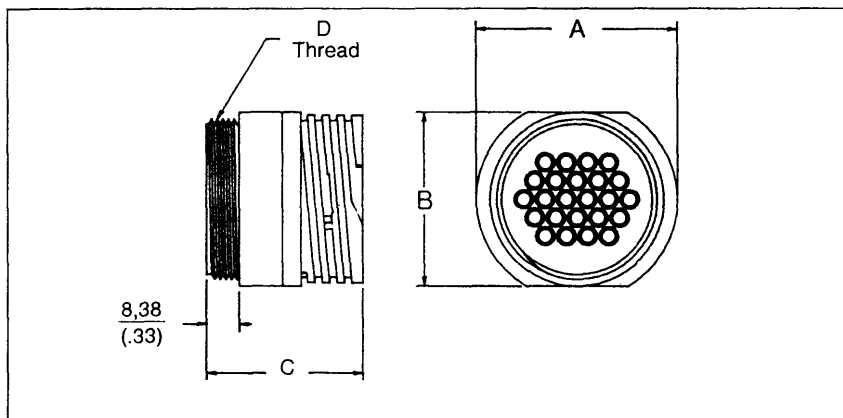


Fig. B



**TRIAD™ 20 CABLE MOUNT RECEPTACLES FOR PIN CONTACTS (Fig. A)**

Cat. No.	Shell Size	No. of Circuits	Dimensions in mm (inch)			
			A	B	C	D
M1121-P04	11	4	23,6 (0.93)	20,8 (.82)	35,8 (1.41)	3/4-20
M1721-P09	17	9	34,0 (1.34)	30,5 (1.20)	35,8 (1.41)	1 3/16-18
M1721-P14	17	14	34,0 (1.34)	30,5 (1.20)	35,8 (1.41)	1 3/16-18
M2321-P24	23	24	43,9 (1.73)	38,6 (1.52)	35,8 (1.41)	1 7/16-18
M2321-P37	23	37	43,9 (1.73)	38,6 (1.52)	35,8 (1.41)	1 7/16-18

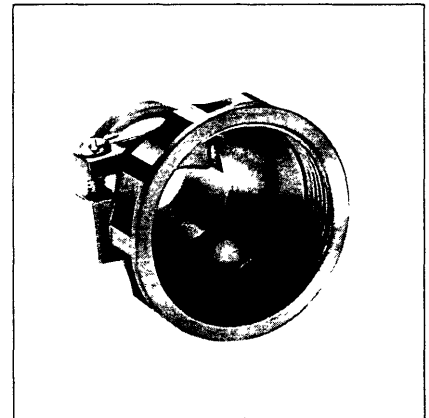
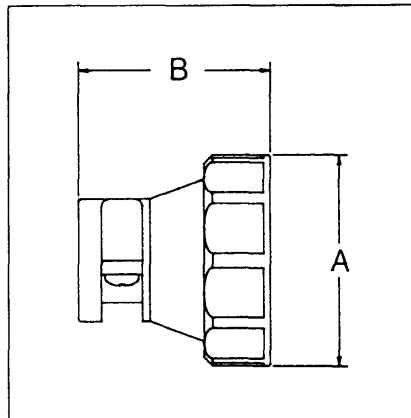
**TRIAD™ 20 CABLE MOUNT RECEPTACLES FOR SOCKET CONTACTS (Fig. B)**

Cat. No.	Shell Size	No. of Circuits	Dimensions in mm (inch)			
			A	B	C	D
M1121-S04	11	4	23,6 (0.93)	20,8 (.82)	29,5 (1.16)	3/4-20
M1721-S09	17	9	34,0 (1.34)	30,5 (1.20)	29,5 (1.16)	1 3/16-18
M1721-S14	17	14	34,0 (1.34)	30,5 (1.20)	29,5 (1.16)	1 3/16-18
M2321-S24	23	24	43,9 (1.73)	38,6 (1.52)	29,5 (1.16)	1 7/16-18
M2321-S37	23	37	43,9 (1.73)	38,6 (1.52)	29,5 (1.16)	1 7/16-18

**PRODUCT DESCRIPTION**

**TRIAD™ 20 Back Shell, Cable Clamp** are for use with cable or discrete wire harnesses and are range taking in design. They are screwed quickly and easily onto the appropriate TRIAD™ 20 Front Shell, Plug or Receptacle assembly.

**Material:**  
Die cast zinc finished with nickel plating.



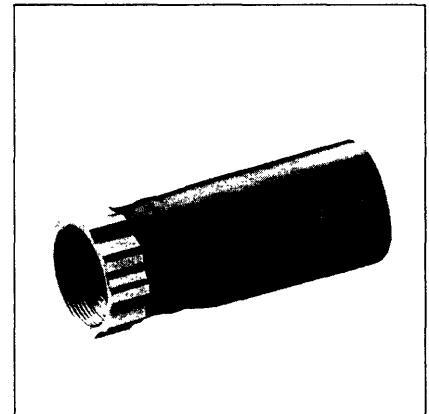
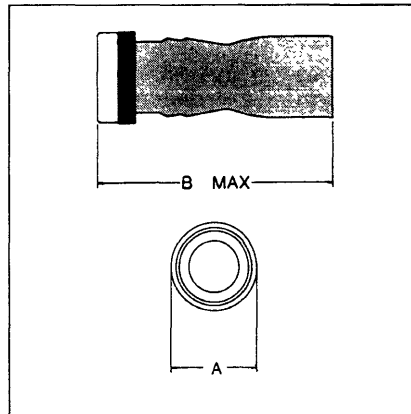
**TRIAD™ 20 BACK SHELL CABLE CLAMP**

Cat. No.	Dimensions mm (inch)		
	A	B	Cable Dia. Range
M118SR-33	25,9 (1.02)	32,8 (1.29)	2,8- 8,4 (.11- .33)
M118SR-45	25,9 (1.02)	36,6 (1.44)	2,8-11,4 (.11- .45)
M178SR-45	36,8 (1.45)	36,6 (1.44)	2,8-11,4 (.11- .45)
M178SR-70	36,8 (1.45)	42,2 (1.66)	8,6-17,8 (.34- .70)
M238SR-70	43,2 (1.70)	39,6 (1.56)	8,6-17,8 (.34- .70)
M238SR-112	43,2 (1.70)	42,2 (1.66)	14,5-28,4 (.57-1.12)

**PRODUCT DESCRIPTION**

**TRIAD™ 20 Back Shell, Cable Entry Seal** comprise of a threaded ring to suit the appropriate TRIAD™ 20 Front Shell, Plug or Receptacle assembly, and a heat shrink boot. Used specifically with jacketed cable, the heat shrink boot provides an environmental seal.

**Material:**  
Front Section anodised aluminium  
Heat shrink boot, polyolefin rated at 90°C



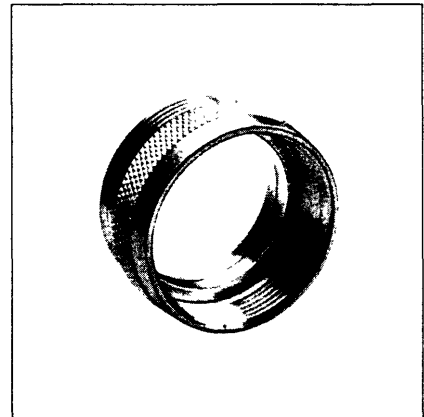
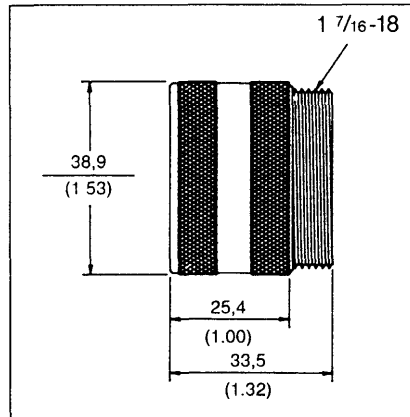
**TRIAD™ 20 BACK SHELL CABLE ENTRY SEAL**

Cat. No.	Dimensions mm (inch)		
	A	B	Cable Dia. Range
M118ES-26	22,4 (.88)	79,9 (2.87)	6,6-15,2 (.26- .60)
M178ES-40	33,3 (1.31)	80,9 (3.18)	10,2-22,4 (.40- .88)
M238ES-55	41,4 (1.63)	90,9 (3.56)	14,0-27,9 (.55-1.10)

#### PRODUCT DESCRIPTION

**TRIAD™ 20 Back Shell Extender** to suit shell size 23, its function is to extend the transition length from the cable end to the contact, thereby making termination of difficult cables more easy.

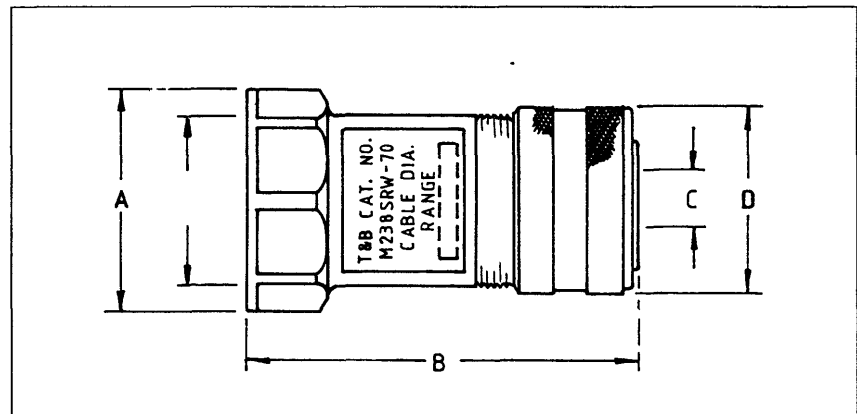
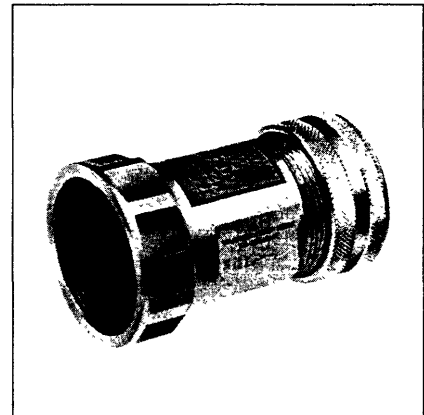
**Material:** Anodised aluminium  
**Cat. No.** M238EXT



#### PRODUCT DESCRIPTION

**TRIAD™ 20 Backshell Watertight** are designed to be liquid tight for applications requiring environmental sealing. They are made from die cast zinc and are plated with nickel for use in harsh atmospheres. The coupling thread between plug or receptacle provides a permanent seal by use of a specially designed sealing ring. The rear entry has been designed to perform with jacketed cable, portable cord or flexible smooth conduit. It meets the weatherproof standard level of IP65.

**Material:** Die cast zinc  
**Plating:** Nickel



Cat. No.	Dimensions mm (inch)				Thread
	A Ø	B max	C = Cable range		
			Min	Max	
M118SRW-12	25,8 (1.02)	55,0 (2.16)	3,18 (.125)	9,52 (.375)	3/4-20
M118SRW-31	25,8 (1.02)	55,0 (2.16)	7,92 (.312)	14,22 (.560)	3/4-20
M178SRW-31	36,1 (1.42)	65,0 (2.56)	7,92 (.312)	14,22 (.560)	1 3/16-18
M178SRW-50	36,1 (1.42)	65,0 (2.56)	12,70 (.500)	19,05 (.750)	1 3/16-18
M238SRW-31	43,3 (1.70)	73,0 (2.87)	7,92 (.312)	14,22 (.560)	1 7/16-18
M238SRW-50	43,3 (1.70)	73,0 (2.87)	12,70 (.500)	19,05 (.750)	1 7/16-18
M238SRW-70	43,3 (1.70)	73,0 (2.87)	17,78 (.700)	24,13 (.950)	1 7/16-18



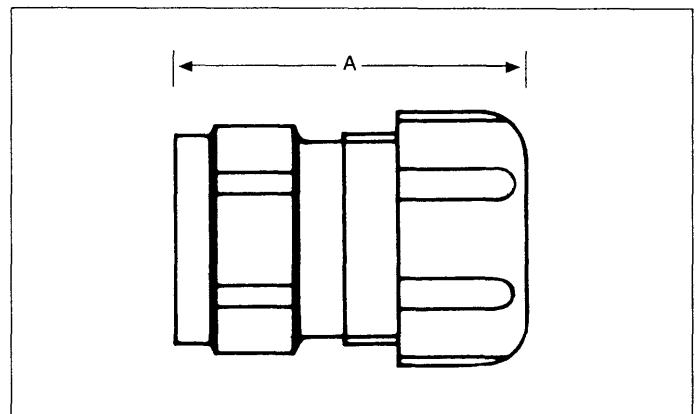
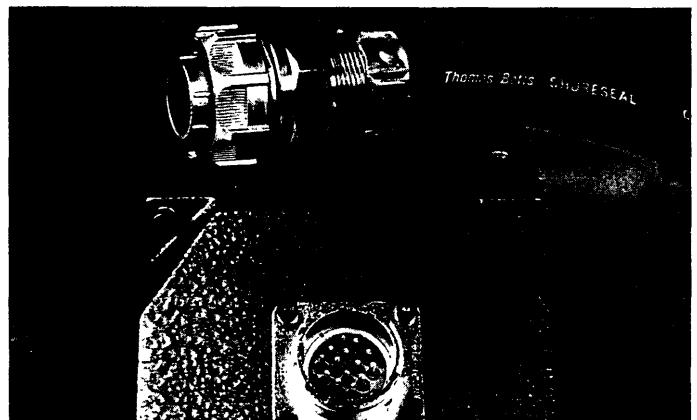
### PRODUCT DESCRIPTION

**TRIAD™ 20 CONDUIT ADAPTORS** are designed to be used in conjunction with the TRIAD™ 20 range of connectors and the SHURESEAL range of liquid-tight flexible metal conduits and fittings

The combination of adaptors, connectors, conduits and fittings offers the user an extensive liquid-tight connector-conduit disconnect system rated to IP65.

**Material:** Steel, zinc plated.

Cat. No.	To Fit Triad™ 20 Shell Size	A (mm)	To Fit I.S.O. Conduit Size
M118F-0375	11	38	16mm
M118F-0500	11	40	20mm
M178F-0375	17	38	16mm
M178F-0500	17	40	20mm
M178F-0750	17	45	25mm
M238F-0500	23	40	20mm
M238F-0750	23	45	25mm
M238F-1000	23	49	32mm



### PRODUCT DESCRIPTION

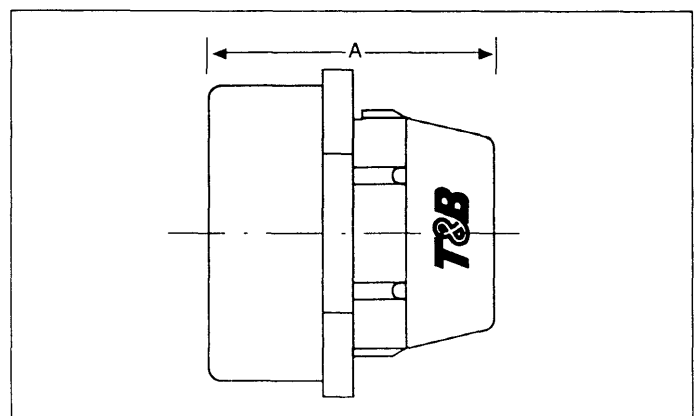
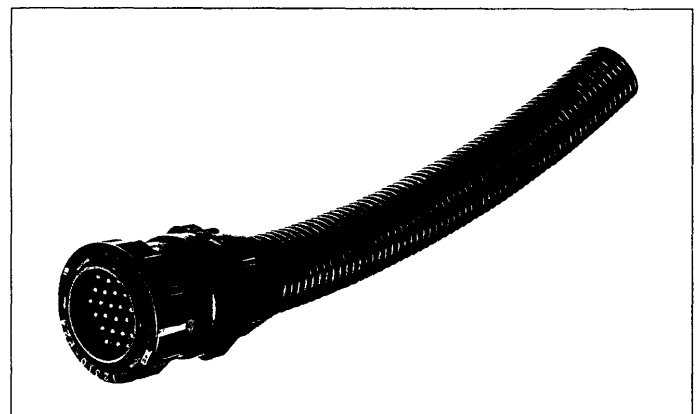
#### TRIAD™ 10 CONDUIT ADAPTORS

are designed to be used with the TRIAD™ 10 range of connectors and the SHURESEAL range of plastic conduits and fittings.

The combination of adaptors, connectors, conduits and fittings offers the user an extensive connector-conduit disconnect system. The system can be upgraded to IP65 with the addition of a sealing ring to the mating receptacle connector, see page 19.

**Material:** Flame retardant Nylon 6/6.

Cat. No.	To Fit Triad™ 10 Shell Size	A (mm)	To Fit Plastic Conduit I.S.O. Size
T118F-12S	11	32	12mm
T178F-16S	17	36	16mm
T178F-20S	17	34	20mm
T238F-20S	23	37	20mm
T238F-25S	23	37	25mm



Note: For suitable conduits refer to Thomas & Betts

**PRODUCT DESCRIPTION**

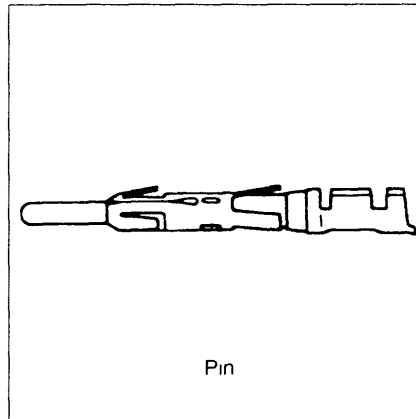
**T93 Series Contacts**, are precision stamped and formed from copper alloy. A stainless steel retainer clip provides positive and accurate location of contact within connector insert.

**T93 Series Contacts** are suitable for use with all TRIAD™ 10 and 20 Series connectors and are available with gold or tin plate finishes. Contacts are supplied as standard in loose piece form. For high volume applications contacts can be supplied on reels, for use with an automatic crimping machine.

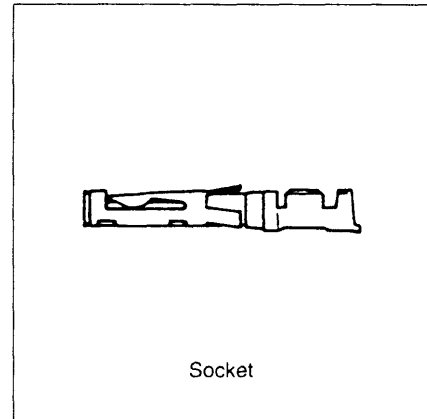
Contact Thomas & Betts Ltd for further details.

**T93 Series Crimp Contacts** are available in four sizes to cover a range of wire conductor sizes from 0.25mm<sup>2</sup> to 2.5mm<sup>2</sup>. (see table below)

**T93 Series Ground Pin Contacts** are available in two sizes to cover a range of wire conductor sizes from 0.75mm<sup>2</sup> to 2.5mm<sup>2</sup>. (see table below)  
This style of pin contact has an extended pin length, which ensures first make/last break contact mating during connector coupling and uncoupling.



Pin



Socket

**T93 Series Contact TECHNICAL DATA**

Working voltage	250V
Current rating	13A
Contact resistance	<5mΩ
Gold plating	0.75 microns
Tin plating	2.54 microns
Contact body	Copper alloy
Retainer clip	Stainless steel
Insertion/extraction force	4.5N

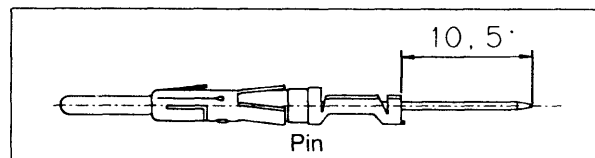
**T93 SERIES PIN AND SOCKET CONTACTS - LOOSE PIECE**

Cat. No. Pins		Cat. No. Sockets		Cat. No. Ground Pin		Wire size mm <sup>2</sup>	Wire Insulation dia. mm
Tin plated	Gold plated	Tin plated	Gold plated	Tin plated	Gold plated		
T9321P-T2	T9321P-G2	T9321S-T2	T9321S-G2	-	-	0.25 - 0.50	2.0 - 2.5
T9320P-T2	T9320P-G2	T9320S-T2	T9320S-G2	-	-	0.25 - 0.50	1.2 - 1.8
T9316P-T2	T9316P-G2	T9316S-T2	T9316S-G2	T9316G-T2	T9316G-G2	0.75 - 1.50	2.0 - 2.5
T9314P-T2	T9314P-G2	T9314S-T2	T9314S-G2	T9314G-T2	T9314G-G2	1.50 - 2.50	2.0 - 4.0

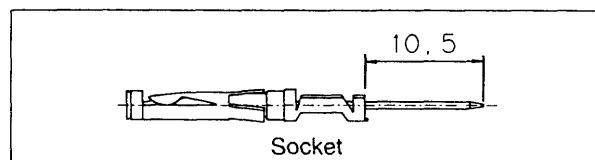
The above are supplied in packs of 100 pieces.  
Application Tool WT10-04

**T93 Series Solder-Pin Contacts** permit the direct mounting of TRIAD™ connectors to printed circuit boards and flexi-circuits.  
Solder-pin tail length 10.5mm

Cat. No. Pins		Cat. No. Sockets	
Tin plated	Gold plated	Tin plated	Gold plated
T9301P-T2	T9301P-G2	T9301S-T2	T9301S-G2



Pin



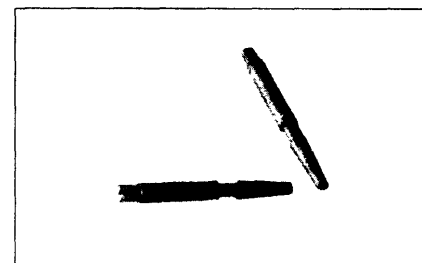
Socket

**PRODUCT DESCRIPTION**

**Keying Pin** suitable for use with both TRIAD™ 10 and 20 Plugs and Receptacles these moulded dummy pins can be installed in one or more unused contact positions.

Cat. No. T9KP16

**Material:**  
Thermoplastic, 105°C with flammability rating per UL94-V2

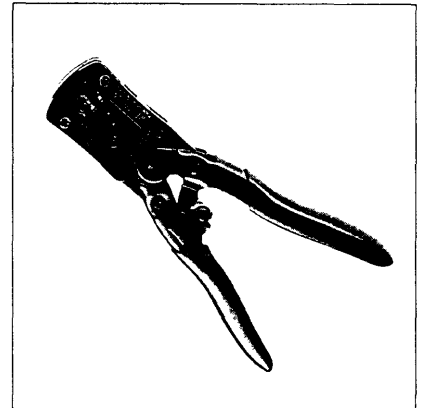


**PRODUCT DESCRIPTION**

Cat. No. WT10-04

**Crimp Tool**

A ratchet hand tool for crimping all TRIAD™ crimp contacts. The tool is fitted with six dies to cover wire sizes from 0.25mm<sup>2</sup> - 2.5 mm<sup>2</sup>.

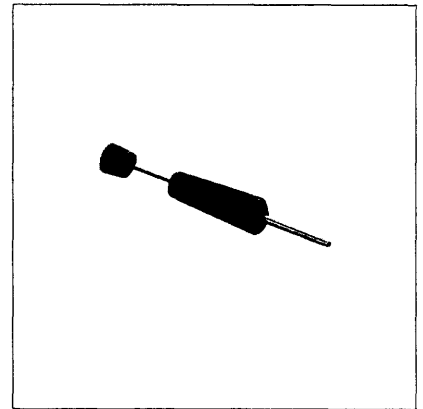


**PRODUCT DESCRIPTION**

Cat. No. TRT16

**Contact Removal Tool**

A low cost plunger tool for removing contacts from TRIAD™ plug and receptacle inserts. Ideal for field service use or small batch production.

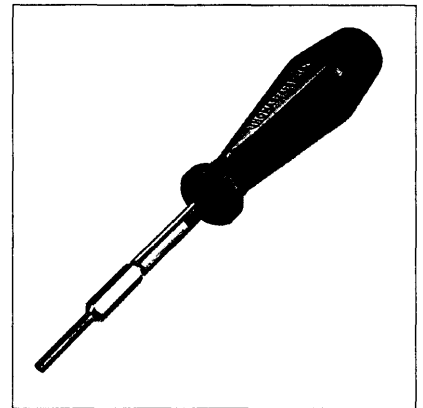


**PRODUCT DESCRIPTION**

Cat. No. TRT16A

**Contact Removal Tool**

A high quality tool for removing contacts from TRIAD™ plug and receptacle inserts. Intended for medium to high volume production use.

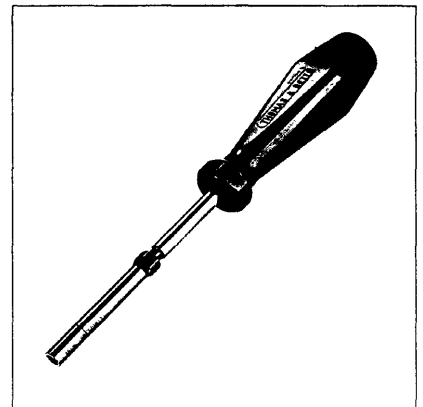


**PRODUCT DESCRIPTION**

Cat. No. TRT17

**Solder-pin Contact Insertion Tool**

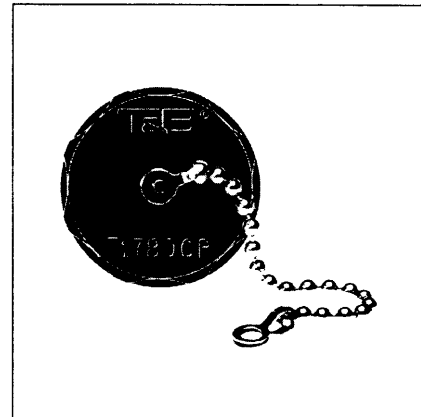
A high quality tool for inserting the T9301 series of solder-pin contacts into TRIAD™ plug and receptacle inserts.



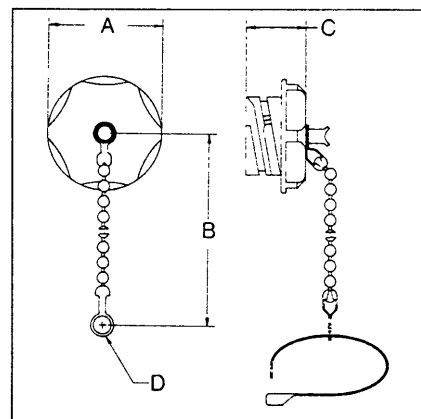
**PRODUCT DESCRIPTION**

**Sealing Cap-Plug** specifically designed for application in dusty or moisture prone environments and used to protect the plug contacts, when disconnected from the receptacle. Suitable for use with both TRIAD™ 10 and 20 Plug Front Shell Assemblies, each Dust Cap is fitted with an environmental sealing ring.

**Material:**  
Thermoplastic rated at 105°C.  
Self-extinguishing classification per UL94V-1.



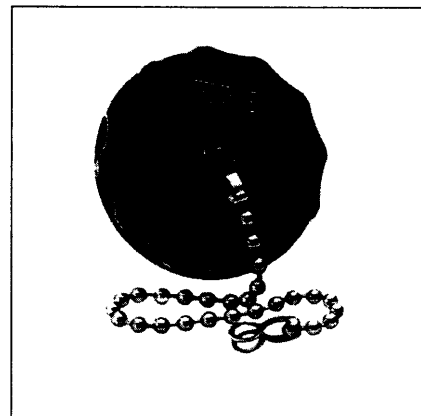
Cat. No.	Dimension mm (inch)			
	A	B	C	D
T118DCP	25,4 (1.00)	76,2 (3.00)	13,2 (.52)	4,1 (.16)
T178DCP	36,3 (1.43)	76,2 (3.00)	14,0 (.55)	4,1 (.16)
T238DCP	44,2 (1.74)	76,2 (3.00)	17,3 (.68)	4,1 (.16)



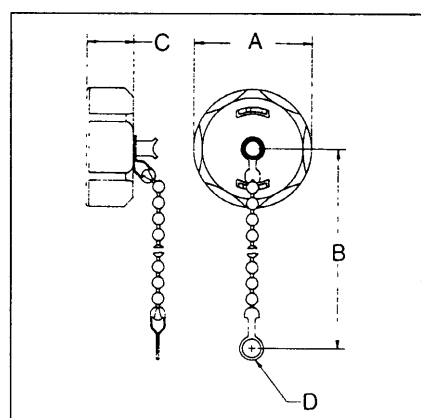
**PRODUCT DESCRIPTION**

**Sealing Cap-Receptacle** specifically designed for application in dusty or moisture prone environments and used to protect the receptacles contacts, when disconnected from the plug. Suitable for use with both TRIAD™ 10 and 20 Receptacles Front Shell Assemblies.

**Material:**  
Thermoplastic rated at 105°C.  
Self-extinguishing classification per UL94V-1.

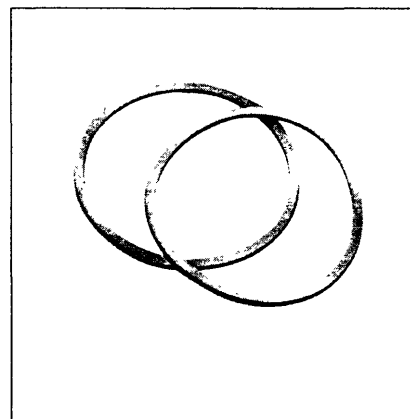


Cat. No.	Dimension mm (inch)			
	A	B	C	D
T118DCR	25,4 (1.00)	76,2 (3.00)	10,2 (.40)	4,1 (.16)
T178DCR	34,5 (1.36)	76,2 (3.00)	11,4 (.45)	4,1 (.16)
T238DCR	44,5 (1.75)	76,2 (3.00)	13,2 (.52)	4,1 (.16)

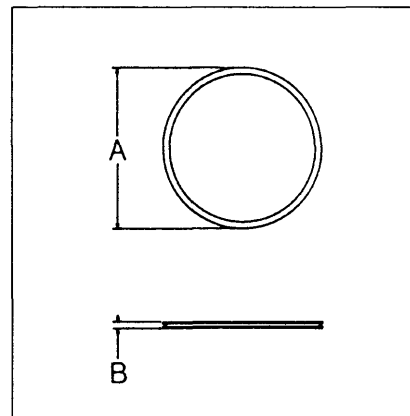


**PRODUCT DESCRIPTION**

**Sealing Rings** these sealing rings are available to accommodate the three shell size options. The sealing rings have been designed for easy installation into the cavity of both TRIAD™ 10-20 Receptacles where required for additional environmental sealing. **Material:** White Neoprene

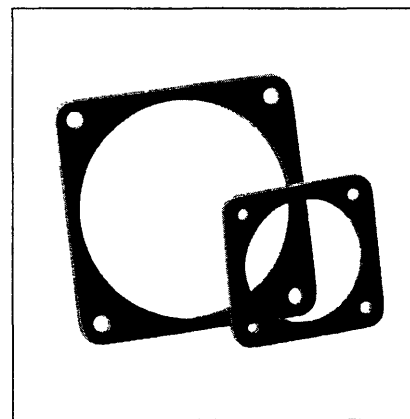


Cat. No.	Dimensions mm (inch)			
	A		B	
T118SR	13,2	(0.52)	1,3	(0.05)
T178SR	22,4	(0.88)	1,3	(0.05)
T238SR	31,2	(1.23)	1,3	(0.05)

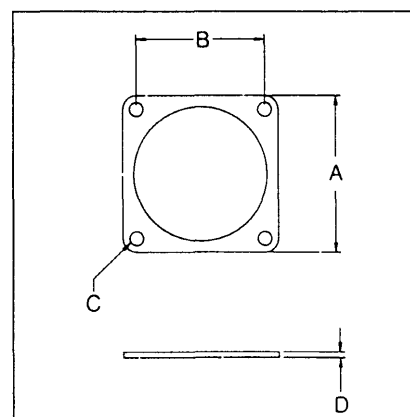


**PRODUCT DESCRIPTION**

**Sealing Gaskets** for environmental sealing applications the gaskets, which are available in the three shell sizes, are assembled between TRIAD™ 10-20 Panel Mount Receptacles and their mounting surface. **Material:** Black Neoprene



Cat. No.	Dimension mm (inch)			
	A	B	C	D
M118GSK	28,7 (1.13)	21,3 (.84)	2,5 (.10)	1,5 (.06)
M178GSK	38,1 (1.50)	28,7 (1.13)	3,0 (.12)	1,5 (.06)
M238GSK	44,5 (1.75)	36,6 (1.44)	3,0 (.12)	1,5 (.06)

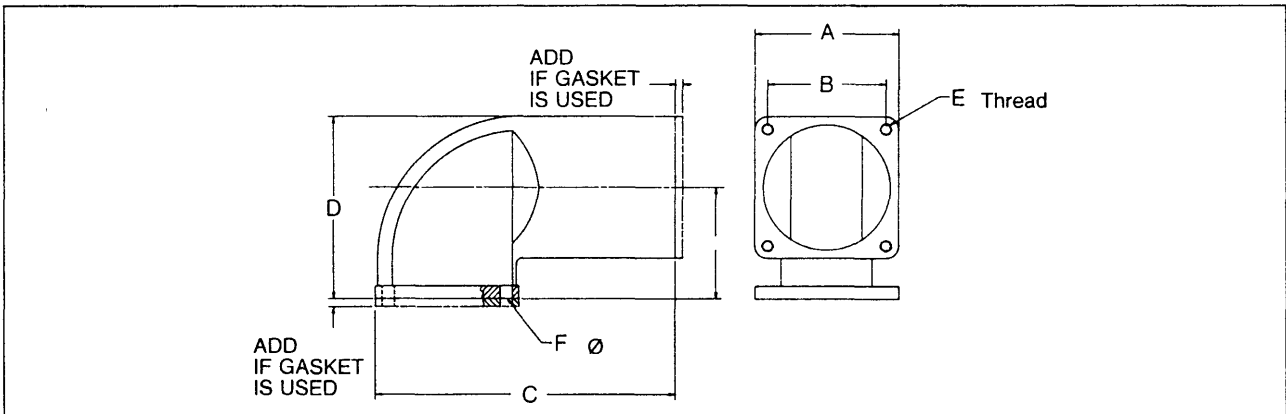
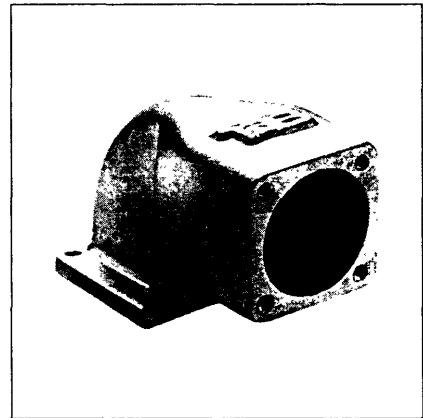


**PRODUCT DESCRIPTION**

**90° Angle Adapter** this product, available to suit three shell sizes, enables TRIAD™ 10-20 Panel Mount Receptacles to be aligned at 90° to the mounting surface. They are supplied complete with a sealing gasket, screws and washers for retention of the receptacle.

Clear holes, with easy access to screw heads, are provided in the flange for mounting to cabinet or panel. The inside cavity is designed free of obstructions, allowing cables or wires to be pulled through without damage.

**Material:**  
Cast Aluminium



Cat. No.	Dimensions mm (inch)						
	A	B	C	D	E*	F Ø	G
<b>M118-90</b>	28,4 (1.12)	21,3 (.84)	54,1 (2.13)	41,4 (1.63)	4-40	3,3 (.13)	27,2 (1.07)
<b>M178-90</b>	38,1 (1.50)	28,7 (1.13)	73,2 (2.88)	50,8 (2.00)	6-32	3,8 (.15)	31,8 (1.25)
<b>M238-90</b>	44,5 (1.75)	36,6 (1.44)	93,2 (3.67)	57,2 (2.25)	6-32	3,8 (.15)	35,1 (1.38)

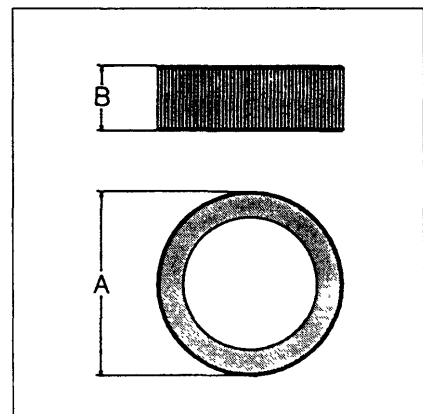
\* Screws and Washers supplied to suit.

**PRODUCT DESCRIPTION**

**TRIAD™ 20 Insert Retainer** for use when plugs or cable mount receptacles are installed without backshells, this glass filled plastic part locks inserts into TRIAD™ 20 plugs and receptacles only. They are supplied with all panel mount receptacles.

**Material:**  
Glass filled thermoplastic rated at 105°C.  
Self-extinguishing class per UL94V-1.

Cat. No.	Dimensions in mm	
	A	B
<b>M118RET</b>	21,3 (.84)	13,7 (.54)
<b>M178RET</b>	32,5 (1.28)	13,2 (.52)
<b>M238RET</b>	38,9 (1.53)	13,7 (.54)



Catalogue No.	Description	Page No.	Catalogue No.	Description	Page No.	Catalogue No.	Description	Page No.
M1110-P04	Plug	10	T1110-P04	Plug	6	T9314S-T2	Socket Tin	16
M1110-S04	Plug	10	T1110-S04	Plug	6	T9316P-G2	Pin Gold	16
M1121-P04	Receptacle Cable	12	T1120-P04	Receptacle Cable	8	T9316P-T2	Pin Tin	16
M1121-S04	Receptacle Cable	12	T1120-S04	Receptacle Cable	8	T9316S-G2	Socket Gold	16
M1131-P04	Receptacle Panel	11	T1130-P04	Receptacle Panel	7	T9316S-T2	Socket Tin	16
M1131-S04	Receptacle Panel	11	T1130-S04	Receptacle Panel	7	T9320P-G2	Pin Gold	16
M118ES-26	Backshell Entry Seal	13	T118DCP	Sealing Cap	18	T9320P-T2	Pin Tin	16
M118F-0375	Conduit Adaptor	15	T118DCR	Sealing Cap	18	T9320S-G2	Socket Gold	16
M118F-0500	Conduit Adaptor	15	T118ES-26	Backshell Entry Seal	9	T9320S-T2	Socket Tin	16
M118GSK	Gasket	19	T118F-12S	Conduit Adaptor	15	T9321P-G2	Pin Gold	16
M118RET	Insert Retainer	20	T118SR	Sealing Ring	19	T9321P-T2	Pin Tin	16
M118SRW-12	Backshell Watertight	14	T118SR-33	Backshell Cable	9	T9321S-G2	Socket Gold	16
M118SRW-31	Backshell Watertight	14		Clamp		T9321S-T2	Socket Tin	16
M118SR-33	Backshell Cable	13	T118SR-45	Backshell Cable	9	T9KP16	Keying Pin	16
	Clamp			Clamp		TRT16	Contact Removal Tool	17
M118SR-45	Backshell Cable	13	T1710-P09	Plug	6	TRT16A	Contact Removal Tool	17
	Clamp		T1710-P14	Plug	6	TRT17	P.C.B Contact Insertion Tool	17
M118-90	90° Angle Adaptor	20	T1710-S09	Plug	6	WT10-04	Hand Crimp Tool	17
M1710-P09	Plug	10	T1710-S14	Plug	6			
M1710-P14	Plug	10	T1720-P09	Receptacle Cable	8			
M1710-S09	Plug	10	T1720-P14	Receptacle Cable	8			
M1710-S14	Plug	10	T1720-S09	Receptacle Cable	8			
M1721-P09	Receptacle Cable	12	T1720-S14	Receptacle Cable	8			
M1721-P14	Receptacle Cable	12	T1730-P09	Receptacle Panel	7			
M1721-S09	Receptacle Cable	12	T1730-P14	Receptacle Panel	7			
M1721-S14	Receptacle Cable	12	T1730-S09	Receptacle Panel	7			
M1731-P09	Receptacle Panel	11	T1730-S14	Receptacle Panel	7			
M1731-P14	Receptacle Panel	11	T178DCP	Sealing Cap	18			
M1731-S09	Receptacle Panel	11	T178DCR	Sealing Cap	18			
M1731-S14	Receptacle Panel	11	T178ES-40	Backshell Entry Seal	9			
M178ES-40	Backshell Entry Seal	13	T178F-16S	Conduit Adaptor	15			
M178F-0375	Conduit Adaptor	15	T178F-20S	Conduit Adaptor	15			
M178F-0500	Conduit Adaptor	15	T178SR	Sealing Ring	19			
M178F-0750	Conduit Adaptor	15	T178SR-45	Backshell Cable	9			
M178GSK	Gasket	19		Clamp				
M178RET	Insert Retainer	20	T178SR-70	Backshell Cable	9			
M178SRW-31	Backshell Watertight	14		Clamp				
M178SRW-50	Backshell Watertight	14	T2310-P24	Plug	6			
M178SR-45	Backshell Cable	13	T2310-P37	Plug	6			
	Clamp		T2310-S24	Plug	6			
M178SR-70	Backshell Cable	13	T2310-S37	Plug	6			
	Clamp		T2320-P24	Receptacle Cable	8			
M178-90	90° Adaptor	20	T2320-P37	Receptacle Cable	8			
M2310-P24	Plug	10	T2320-S24	Receptacle Cable	8			
M2310-P37	Plug	10	T2320-S37	Receptacle Cable	8			
M2310-S24	Plug	10	T2330-P24	Receptacle Panel	7			
M2310-S37	Plug	10	T2330-P37	Receptacle Panel	7			
M2321-P24	Receptacle Cable	12	T2330-S24	Receptacle Panel	7			
M2321-P37	Receptacle Cable	12	T2330-S37	Receptacle Panel	7			
M2321-S24	Receptacle Cable	12	T238DCP	Sealing Cap	18			
M2321-S37	Receptacle Cable	12	T238DCR	Sealing Cap	18			
M2331-P24	Receptacle Panel	11	T238ES-55	Backshell Entry Seal	9			
M2331-P37	Receptacle Panel	11	T238F-20S	Conduit Adaptor	15			
M2331-S24	Receptacle Panel	11	T238F-25S	Conduit Adaptor	15			
M2331-S37	Receptacle Panel	11	T238SR	Sealing Ring	19			
M238ES-55	Backshell Entry Seal	13	T238SR-112	Backshell Cable	9			
M238EXT	Backshell Extender	14		Clamp				
M238F-0500	Conduit Adaptor	15	T238SR-70	Backshell Cable	9			
M238F-0750	Conduit Adaptor	15		Clamp				
M238F-1000	Conduit Adaptor	15	T9301P-G2	P.C.B. Pin Contact	16			
M238GSK	Gasket	19	T9301P-T2	P.C.B. Pin Contact	16			
M238RET	Insert Retainer	20	T9301S-G2	P.C.B. Socket Contact	16			
M238SRW-31	Backshell Watertight	14	T9301S-T2	P.C.B. Socket Contact	16			
M238SRW-50	Backshell Watertight	14	T9314G-G2	Ground Pin Gold	16			
M238SRW-70	Backshell Watertight	14	T9314G-T2	Ground Pin Tin	16			
M238SR-112	Backshell Cable	13	T9316G-G2	Ground Pin Gold	16			
	Clamp		T9316G-T2	Ground Pin Tin	16			
M238SR-70	Backshell Cable	13	T9314P-G2	Pin Gold	16			