



SINGLE POLE

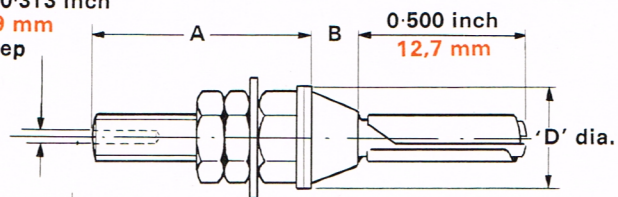
L517 only 0.070 inch

1,8 mm dia. hole

× 0.313 inch

7,9 mm

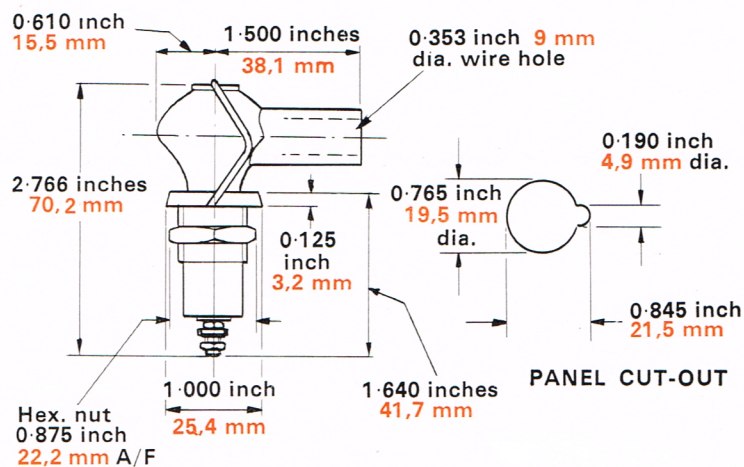
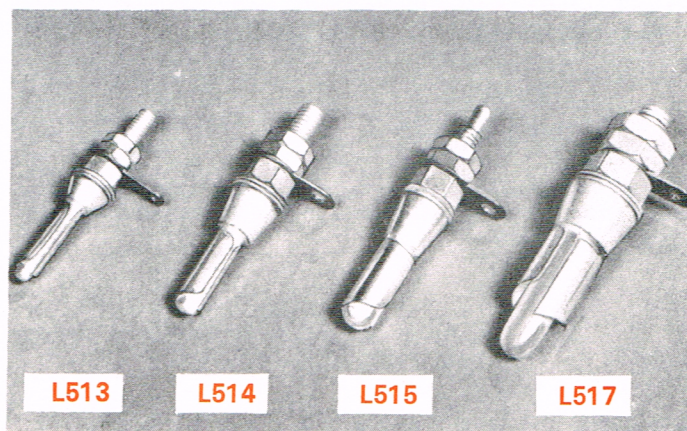
deep



Plug to suit
socket of 'S' dia.

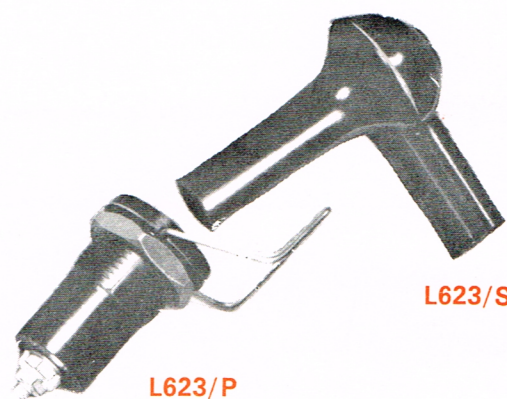
0.059 inch
1,5 mm dia.

Solder spill, L515 only



L623/P & S assembled

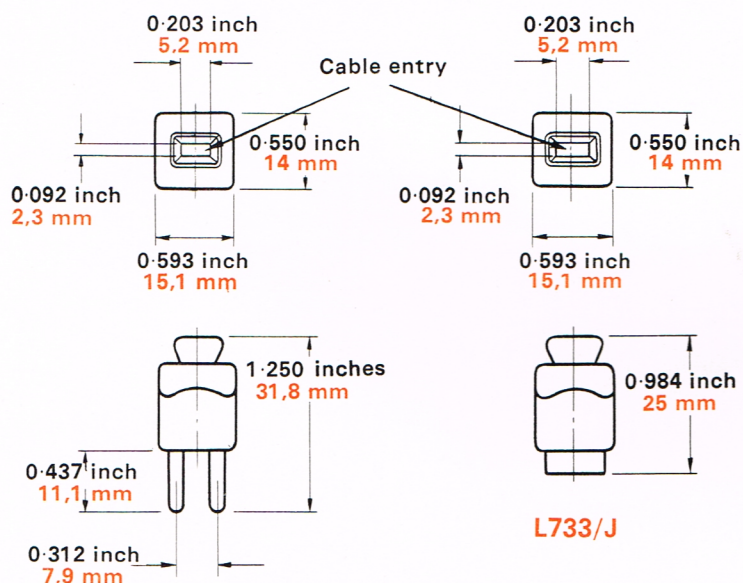
PANEL CUT-OUT



L623/S

L623/P

TWO POLE



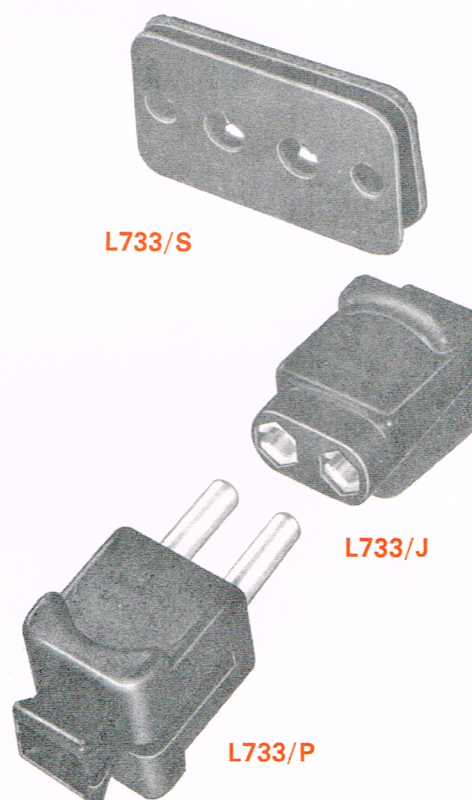
L733/P

L733/J

L733/S

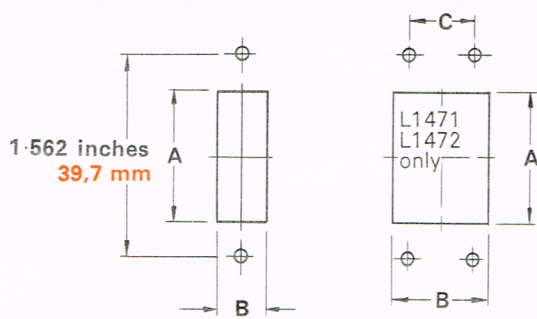
L733/J

L733/P





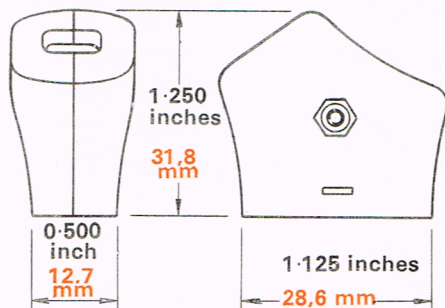
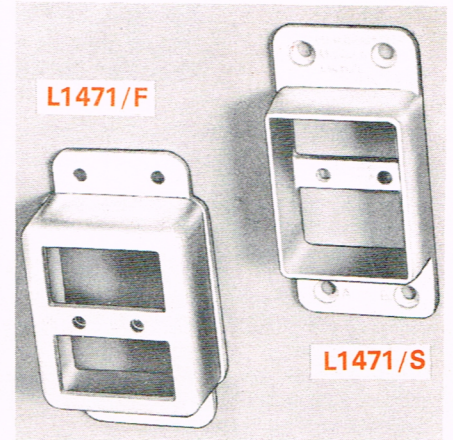
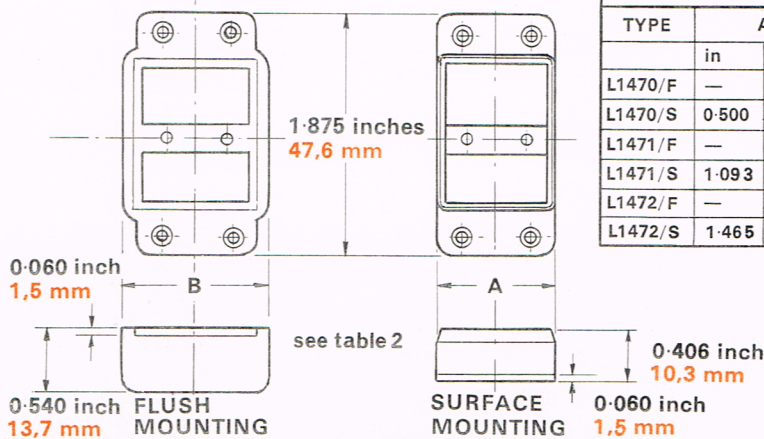
MINIATURE UNITOR ACCESSORIES



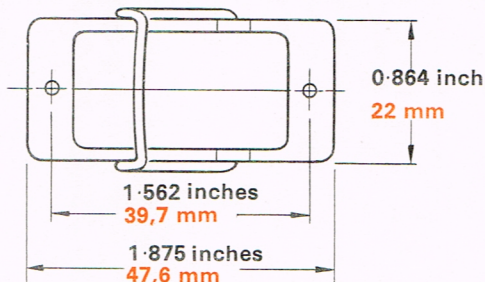
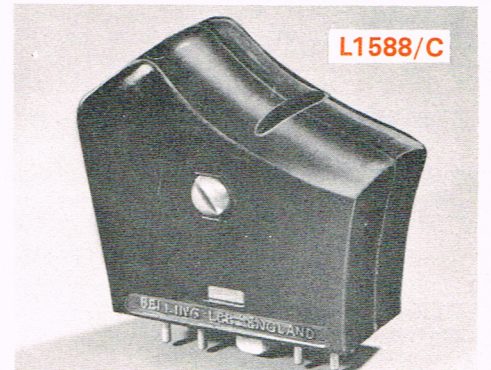
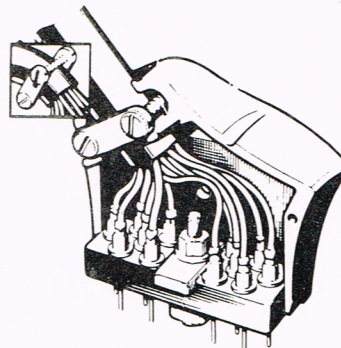
PANEL CUT-OUT see table 1

TABLE 1						
TYPES	A		B		C	
	in	mm	in	mm	in	mm
L1470/F	1-360	34,5	0-715	18,2	—	—
L1470/S	1-031	26,2	0-406	10,3	—	—
L1471/F	1-360	34,5	1-093	27,8	0-500	12,7
L1471/S	1-031	26,2	0-781	19,8	0-500	12,7
L1472/F	1-486	37,3	1-360	34,5	0-937	23,8
L1472/S	1-031	26,2	1-156	29,4	0-937	23,8

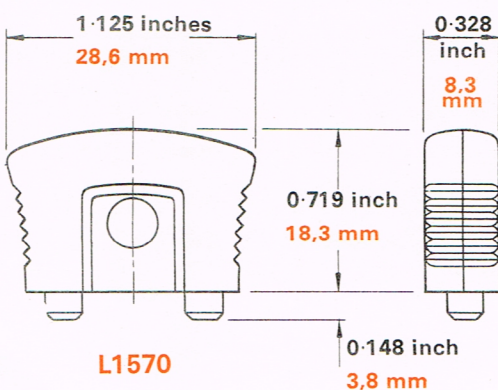
TABLE 2				
TYPE	A		B	
	in	mm	in	mm
L1470/F	—	—	0-719	18,3
L1470/S	0-500	12,7	—	—
L1471/F	—	—	0-875	22,2
L1471/S	1-093	27,8	—	—
L1472/F	—	—	1-250	31,8
L1472/S	1-465	37,3	—	—



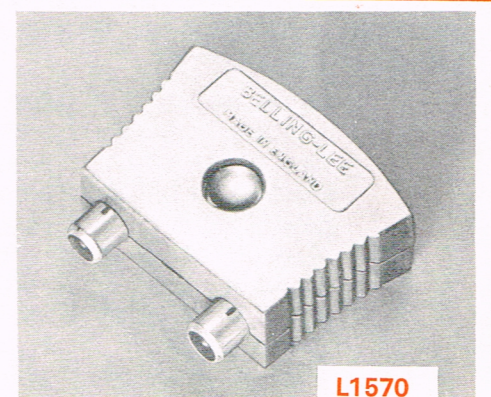
L1588/C



L1588/R



L1570



L1570

L F CONNECTORS

UNITORS PATTERN 102

L653/P Ag OR Au PLUG, 4-POLE
L653/S Ag OR Au SOCKET, 4-POLE
L654/P Ag OR Au PLUG, 8-POLE
L654/S Ag OR Au SOCKET, 8-POLE
L655/P Ag OR Au PLUG, 12-POLE
L655/S Ag OR Au SOCKET, 12-POLE
L656/P Ag OR Au PLUG, 18-POLE
L656/S Ag OR Au SOCKET, 18-POLE
L657/P Ag OR Au PLUG, 25-POLE
L657/S Ag OR Au SOCKET, 25-POLE
L1328/P/Ag OR Au PLUG, 25-POLE
L1328/S/Ag OR Au SOCKET, 25-POLE

These Unitors were originally developed under a Government contract in which reliability was a paramount requirement, and they have Qualification Approval. The male contacts have a controlled degree of float to facilitate blind engagement, and the configuration is designed to obviate incorrect mating. The mouldings are track resistant, and clearance is provided between the mating faces for air to circulate and dispel any moisture deposited. All Unitors have two heavy current poles, but the 25-pole has a choice of two or four. Intermateable with removable contact range.

While originally devised for direct chassis-to-chassis connections, their versatility has been extended by the ancillary range of cable outlets and shroud retainers.

SPECIFICATION: DEF-5321

CURRENT RATING: Small poles, 3 A
 Large poles, 10 A
 (temperature rise $\leq 20^{\circ}\text{C}$)

BREAKDOWN (d.c.): At sea level 3 kV, at 20 000 m 66 000 ft 750 V

VOLTAGE PROOF: 2 kV

CREEPAGE DISTANCE: 3.1 mm 0.12 inch between poles
 4.2 mm 0.17 inch between any pole and chassis

CONTACT RESISTANCE (max): 2 milliohms (small poles)
 1.2 milliohms (large poles)

INSULATION RESISTANCE: >100 megohms

CAPACITANCE: 4 pF (between poles) at 800 Hz

HUMIDITY: Class H5 (DEF-5011)

TEMPERATURE RANGE: -40°C to $+100^{\circ}\text{C}$

INSERTION/WITHDRAWAL FORCE: 4.4 N 1 lbF per contact

WIRE SIZES (max): Small poles 0.04 inch 1 mm 19 s.w.g.
 Large poles 0.067 inch 1.7 mm 16 s.w.g.

PANEL THICKNESS: Flange on wiring side of panel, 0.125 inch 3.2 mm
 Flange on mating side of panel, no limit

MATERIALS: Black nylon-filled phenolic resin mouldings, silver (Ag) or gold-plated (Au) solid brass pins and beryllium-copper sockets.

WEIGHT (average — mated pair): L653 0.3 oz 8.4 g
 L654 0.48 oz 13.5 g
 L655 0.69 oz 19.6 g
 L656 0.98 oz 27.8 g
 L657 1.16 oz 32.8 g
 L1328 1.3 oz 37.2 g

	4-POLE 2 lge 2 small	8-POLE 2 lge 6 small	12-POLE 2 lge 10 small	18-POLE 2 lge 16 small	25-POLE 2 or 4 large
	inch mm	inch mm	inch mm	inch mm	inch mm
A	0.406 10,3	0.578 14,7	0.843 21,4	0.843 21,4	1.187 30,2
B	1.437 36,5	1.484 37,7	1.50 38,1	2.000 50,8	1.750 44,5
C	0.365 9,3	0.537 13,6	0.740 18,8	0.740 18,8	1.077 27,4
D	—	0.312 7,9	0.500 12,7	0.500 12,7	0.875 22,2
E	1.015 25,8	1.060 26,9	1.061 27	1.515 38,5	1.265 32,1
F	1.250 31,8	1.296 32,9	1.296 32,9	1.750 44,5	1.500 38,1

CONTACT IDENTIFICATION

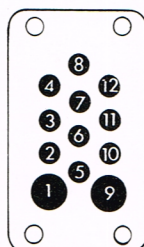
Viewed on wiring side



L653/P & S



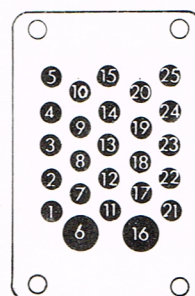
L654/P



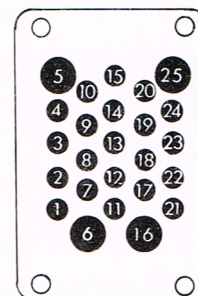
L655/P



L656/P



L657/P



L1328/P

All plug and socket contacts are numbered on the face and reverse side of the mouldings.

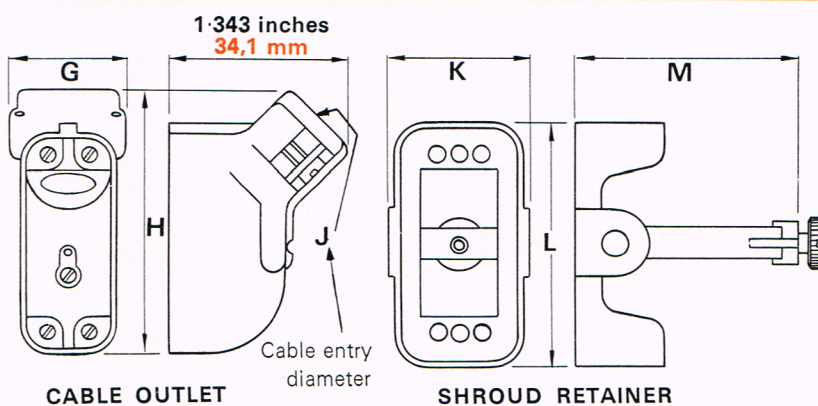
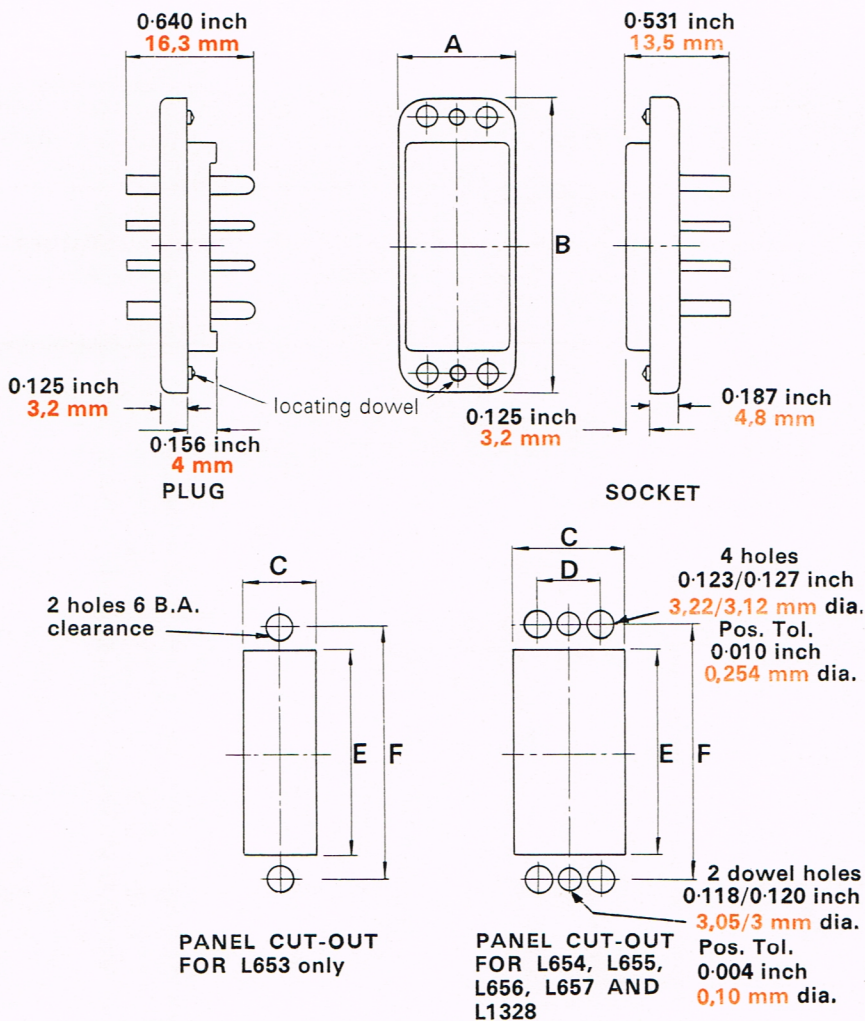
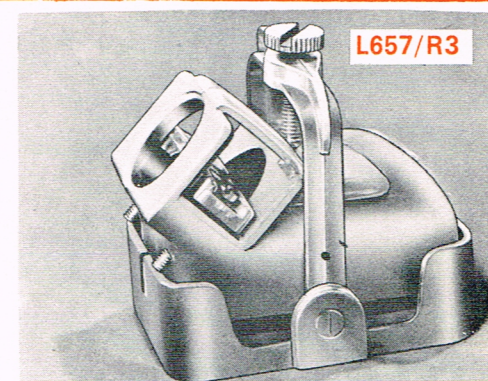
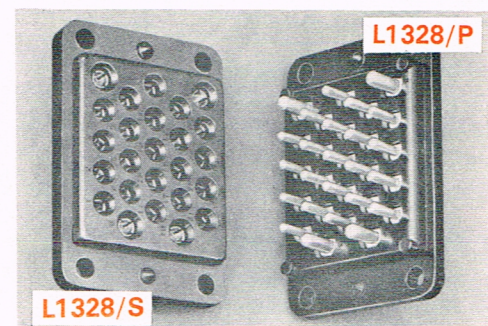
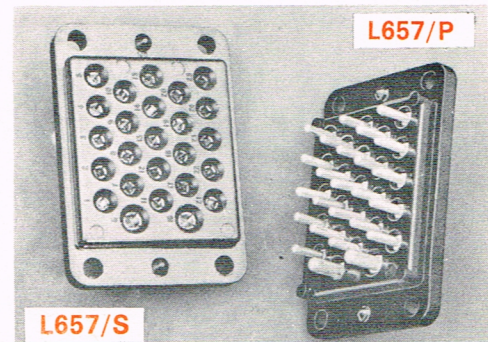
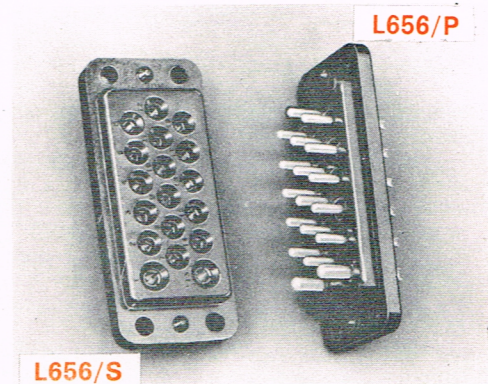
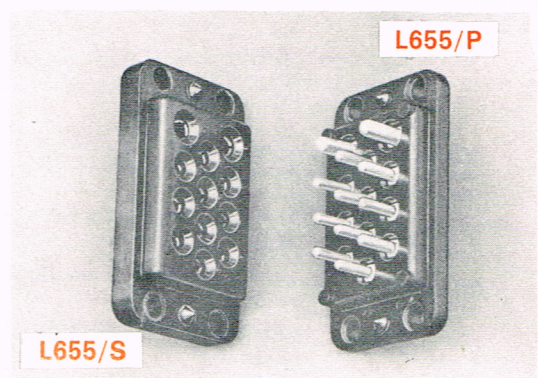
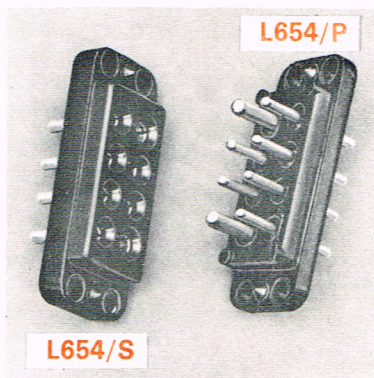
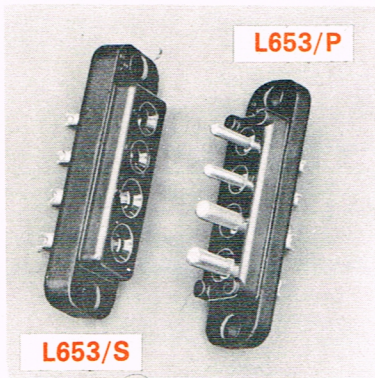
UNITORS, PATTERN 102 CABLE OUTLETS AND SHROUD RETAINERS

L653/C3 CABLE OUTLET } FOR USE WITH
L653/R3 SHROUD RETAINER } 4-POLE UNITOR
L654/C3 CABLE OUTLET } FOR USE WITH
L654/R3 SHROUD RETAINER } 8-POLE UNITOR
L655/C3 CABLE OUTLET } FOR USE WITH
L655/R3 SHROUD RETAINER } 12-POLE UNITOR
L656/C3 CABLE OUTLET } FOR USE WITH
L656/R3 SHROUD RETAINER } 18-POLE UNITOR
L657/C3 CABLE OUTLET } FOR USE WITH
L657/R3 SHROUD RETAINER } 25-POLE UNITOR

	4-POLE	8-POLE	12-POLE	18-POLE	25-POLE
	inch mm	inch mm	inch mm	inch mm	inch mm
G	0.813 20,6	0.906 23	0.969 24,6	0.969 24,6	1.313 33,3
H	1.906 48,4	1.906 48,4	1.906 48,4	2.313 58,7	2.047 52
J	0.313 7,9	0.438 11,1	0.484 12,3	0.578 14,7	0.676 17,2
K	0.875 22,2	1.031 26,2	1.281 32,5	1.281 32,5	1.641 41,7
L	1.750 44,5	1.812 46	1.812 46	2.281 57,9	2.063 52,4
M	1.719 43,7	1.719 43,7	1.812 46	1.812 46	1.812 46



PATTERN 102 UNITORS



L F CONNECTORS

CRIMP/SOLDER REMOVABLE CONTACT UNITORS

- L1610/S

12-POLE

L1611/S

18-POLE

L1612/S

25-POLE
- UNITOR SOCKET MOULDING KIT, INCLUDING SCREWS

L1610/P

12-POLE

L1611/P

18-POLE

L1612/P

25-POLE

UNITOR PLUG MOULDING KIT, INCLUDING SCREWS

L1800/ Ag OR Au

LARGE SOCKET ASSEMBLY (SIZE 12)

L1801/ Ag OR Au

SMALL SOCKET ASSEMBLY (SIZE 16)

L1802/ Ag OR Au

LARGE PLUG ASSEMBLY (SIZE 12)

L1803/ Ag OR Au

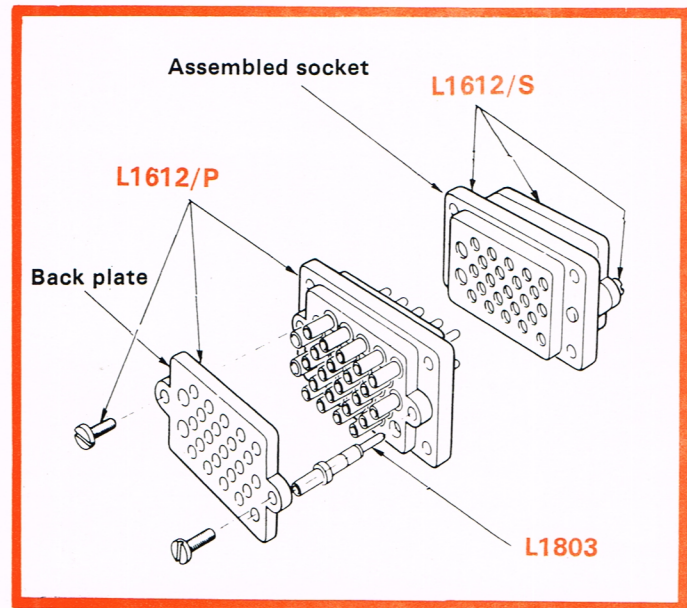
SMALL PLUG ASSEMBLY (SIZE 16)

These new additions to the BELLING-LEE series of high reliability unitors offer removable contacts for pre-crimping or soldering and a greater working temperature range. After assembly, the contacts are positively retained in the body moulding by the moulded back-plate but may be individually withdrawn for re-wiring on the removal of two screws.

Available in 12, 18 and 25-pole versions, with an auxiliary range of light alloy cable outlets and shroud retainers. Fixing centres are identical to those of the corresponding fixed contact pattern. Each connector has two heavy duty (10 A) poles which also provide polarization. When used as cable-to-chassis connectors additional polarization is provided by the cable outlet.

These units are supplied unassembled.

Example: 25-pole Unitor=one L1612/S Kit, one L1612/P Kit, twenty-three L1801/Ag or Au sockets, twenty-three L1803/Ag or Au plugs, two L1800/Ag or Au sockets, and two L1802/Ag or Au plugs.



CURRENT RATING: Small poles, 3 A. Large poles, 10 A
CONTACT RESISTANCE (maximum): Small poles, 2 milliohms
Large poles, 1 milliohm

VOLTAGE PROOF (d.c.): 2 kV
INSULATION RESISTANCE: >100 megohms
TEMPERATURE RANGE: —55 °C to +125 °C
HUMIDITY: H5 (DEF-5011)
ALTITUDE: 0–66 000 ft 20 000 metres

INSERTION/WITHDRAWAL FORCE(per pole):
3.33 N to 1.11 N 4 to 12 ozf

WIRE SIZES: Small poles, 19 to 40/0-0076 inch
Large poles, 70 to 110/0-0076 inch

CRIMPING TOOLS: Small poles, No. 16 Large poles No. 12

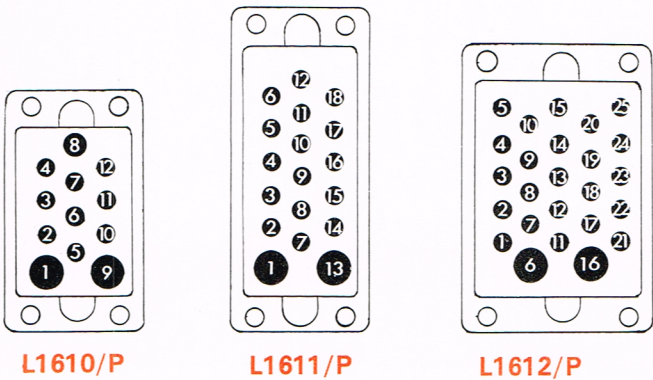
PANEL THICKNESS (maximum):
Flange on wiring side of panel, 0.125 inch 3.2 mm
Flange on mating side of panel, no limit

MATERIALS: Insulants, Body, diallyl-phthalate
Retaining plate, nylon, glass fibre re-inforced
Contacts, pins, brass; Sockets, beryllium-copper

FINISH: Contacts, Silver or Gold-plated (add suffix Ag or Au respectively, to part reference number)

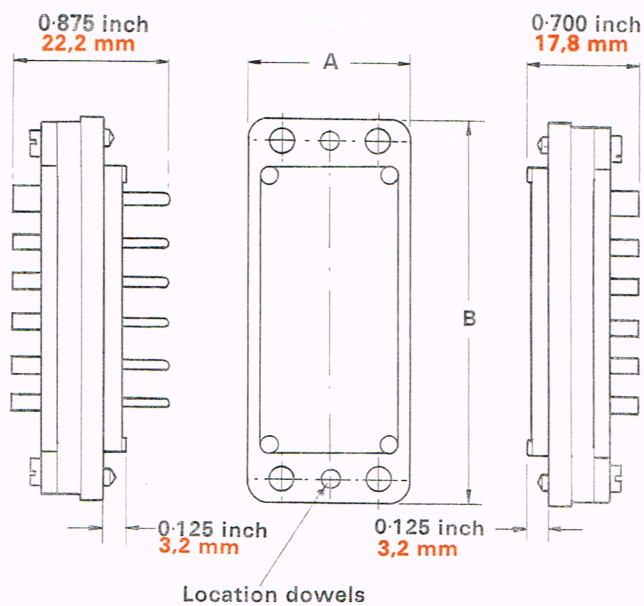
ACCESSORIES:		
SIZE	CABLE OUTLET	SHROUD RETAINER
12-pole	L1655/C	L1610/R
18-pole	L1656/C	L1611/R
25-pole	L1657/C	L1612/R

CONTACT IDENTIFICATION Viewed on wiring side



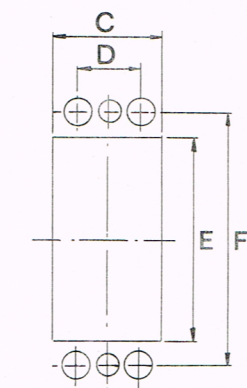


REMOVABLE CONTACT UNITORS

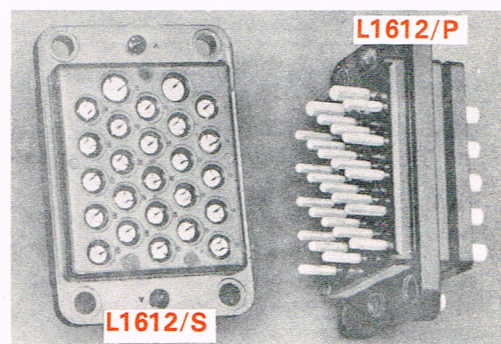
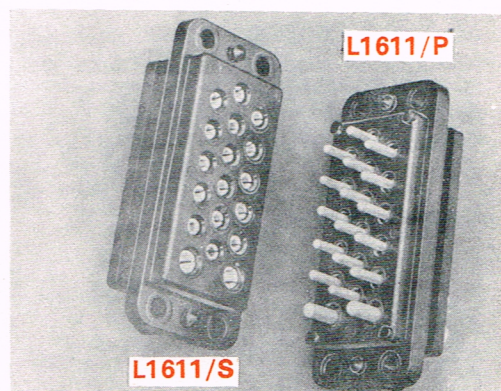
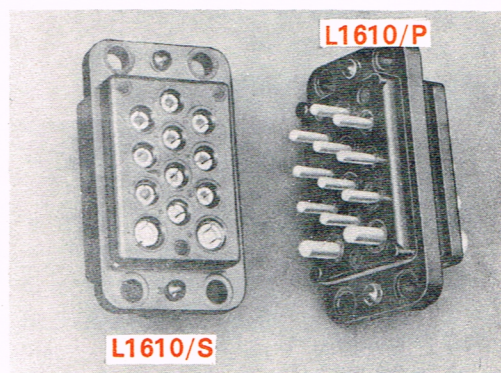


PLUG

SOCKET

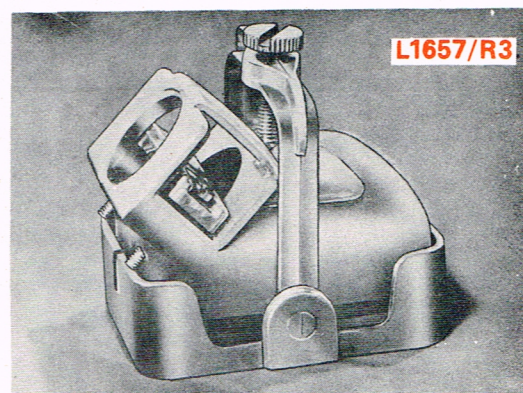
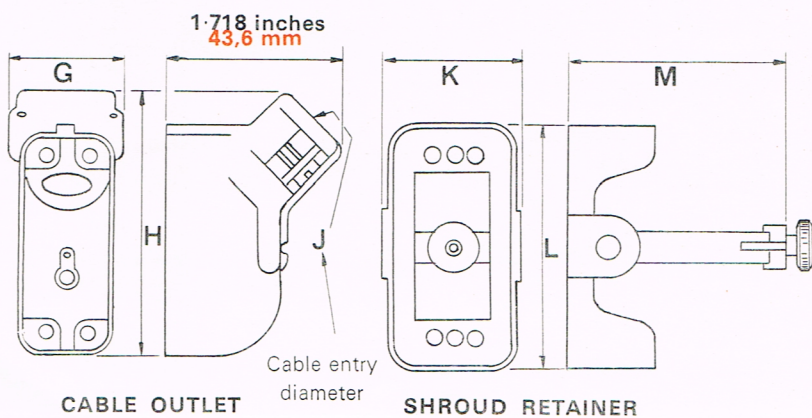


PANEL CUT-OUT



	12-POLE		18-POLE		25-POLE	
	inch	mm	inch	mm	inch	mm
A	0.843	21,4	0.843	21,4	1.187	30,2
B	1.50	38,1	2.00	50,8	1.750	44,5
C	0.740	18,8	0.740	18,8	1.077	27,4
D	0.500	12,7	0.500	12,7	0.875	22,2
E	1.061	27	1.515	38,5	1.265	32,1
F	1.296	32,9	1.750	44,5	1.500	38,1

	12-POLE		18-POLE		25-POLE	
	inch	mm	inch	mm	inch	mm
G	0.969	24,6	0.969	24,6	1.313	33,3
H	1.906	48,4	2.313	58,7	2.047	52
J	0.484	12,3	0.578	14,7	0.676	17,2
K	1.281	32,5	1.281	32,5	1.641	41,7
L	1.812	46	2.281	57,9	2.063	52,4
M	2.093	53,1	2.093	53,1	2.093	53,1



L F CONNECTORS

PRINTED CIRCUIT STANDARD EDGE CONNECTORS

0.1 INCH MODULE

L1355/Ag OR Au 8-WAY CONNECTOR

L1486/Ag OR Au 32-WAY CONNECTOR

0.15 INCH MODULE

L1369/Ag OR Au 8-WAY CONNECTOR

L1370/Ag OR Au 12-WAY CONNECTOR

L1372/Ag OR Au 18-WAY CONNECTOR

L1740/Ag OR Au 24-WAY CONNECTOR

L1741/Ag OR Au 34-WAY CONNECTOR

Domed beryllium-copper contacts of unique design, carefully heat treated, ensure gentle and consistent connection with minimum wear and low resistance. The contact positions are numbered on the top and underside of the mouldings.

CURRENT RATING: 3 A per contact (printed wiring)
4 A per contact (free wiring)
Temperature rise <10 °C

BREAKDOWN VOLTAGE (d.c.):

	At Sea Level	At 20,000 m 68,000 ft
Between contacts 0.1 inch module	>2kV	400V
Between contact 0.15 inch module	>3kV	>500V
Contact/earth 0.15 inch module	4kV	>500V

INSULATION RESISTANCE: $\geq 10 \times 10^3$ megohms after climatic exposure

CONTACT RESISTANCE: Au, 5 milliohms
Ag, 7 milliohms maximum

CAPACITANCE: 0.1 pF between contacts

TEMPERATURE RANGE: -40 °C to +100 °C

HUMIDITY: A4 (B.S.2011)

CONTACT PRESSURE (each): 3.3 N 12 ozf Ag
2.7 N 10 ozf Au

INSERTION/WITHDRAWAL FORCE: 1.33-1 N 4-8-
3.6 ozf per contact

BOARD THICKNESS: 0.057-0.068 inch 1.73-1.45 mm

PANEL THICKNESS: 0.125 inch 3 mm maximum

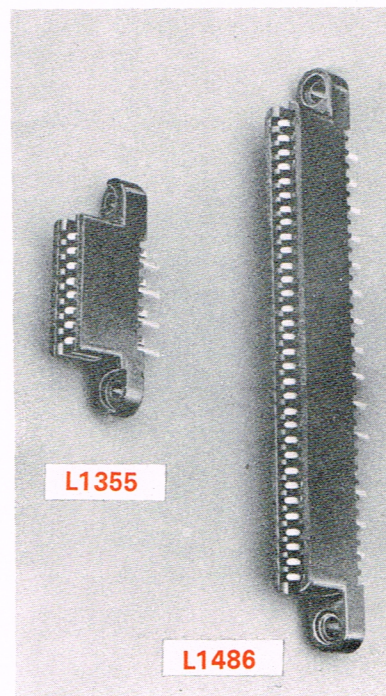
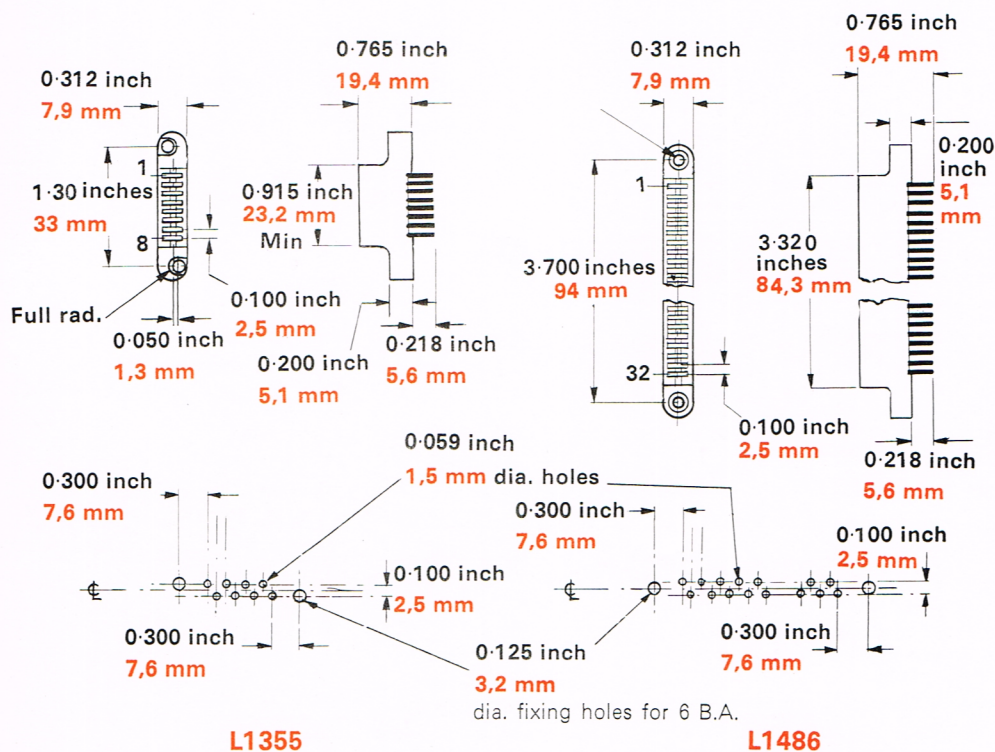
CONTACT WIDTH: 0.048 inch 1.2 mm maximum

PRINTED CONTACT WIDTH: 0.070 inch 1.8 mm

CONTACTS: Beryllium-copper, silver (Ag) or gold-plated (Au)
Maximum conductor size (free wiring) 0.020 inch dia.
25 s.w.g. 0.5 mm dia.

WEIGHT (average): L1355 3.7 g 0.13 oz
L1486 12 g 0.43 oz

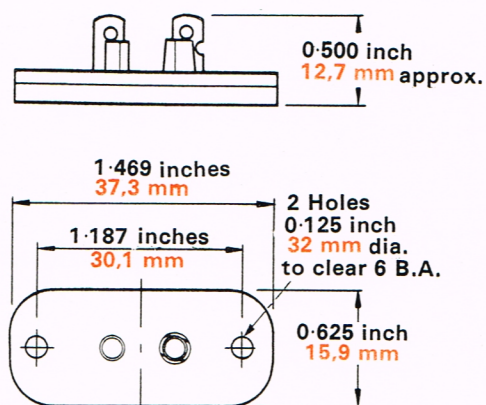
0.1 INCH MODULE CONNECTORS



PANEL CUT-OUTS
viewed from P.C. side

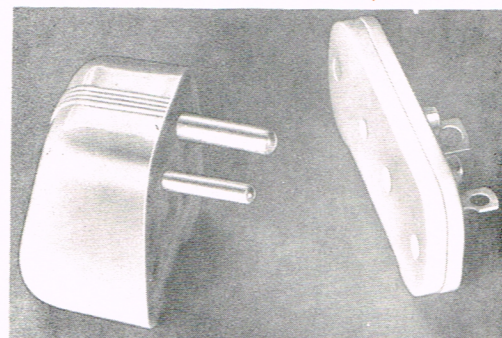


TWO POLE



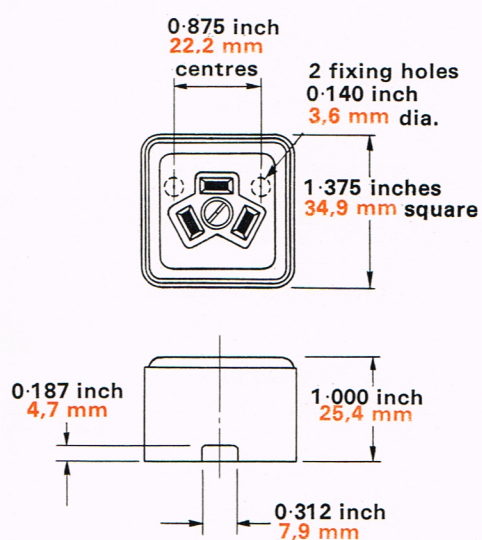
L1495/S

L1495/S

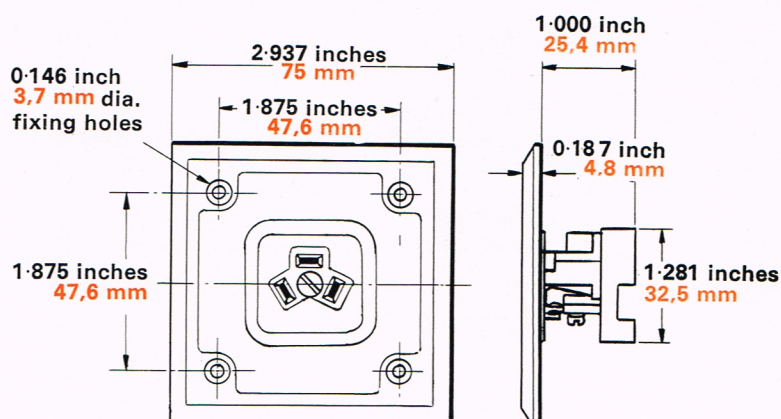


L1495/P

THREE POLE



LO 303/S



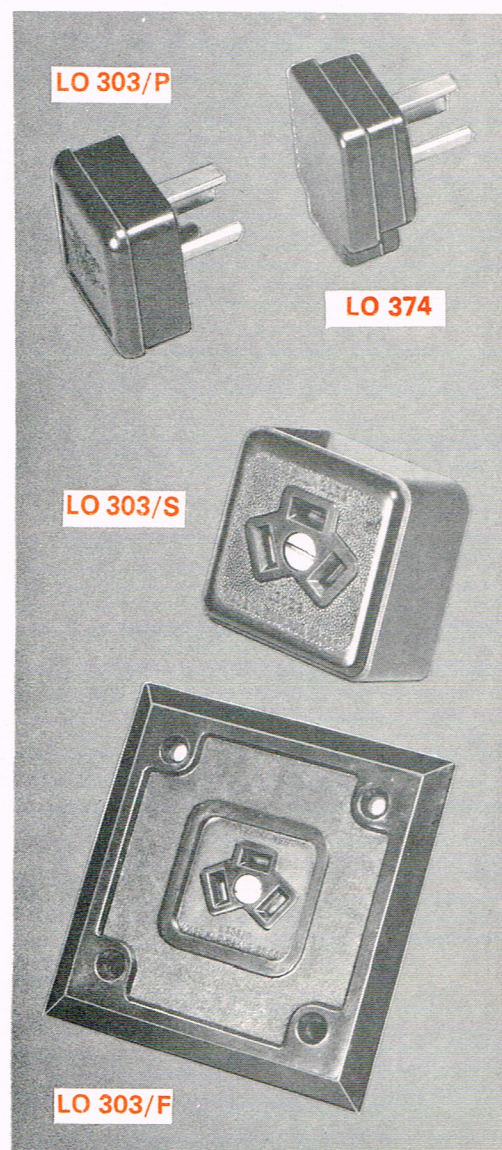
LO 303/F

LO 303/P

LO 374

LO 303/S

LO 303/F



L F CONNECTORS

3-POLE CONNECTOR—SPLASH PROOF

L1326/FP FREE PLUG

L1326/CS FIXED SOCKET

L764/C/A PROTECTIVE COVER

These metal clad, splashproof connectors are extremely robust and have a bayonet lock to prevent accidental uncoupling.

CURRENT RATING: 15 A (temperature rise $\leq 30^{\circ}\text{C}$)

BREAKDOWN VOLTAGE: $>3\text{ kV}$

INSULATION RESISTANCE: $>10^3$ megohms

CONTACT RESISTANCE (maximum): 4 milliohms

CABLE DIAMETER (maximum): 0.315 inch **8 mm**

CONDUCTOR DIAMETER (maximum): 0.075 inch **1.9 mm**

FINISH: Alloy housing, anodised; contacts, electro-tinned

WEIGHT (average): C/A **13.5 g** 0.48 oz
CS **23.5 g** 0.83 oz
FP **38.6 g** 1.36 oz

3-POLE MINIATURE MAINS CONNECTOR

L1436 A/P FREE PLUG

L1436 B/S FIXED SOCKET

This miniature 3-pole mains connector combines modern styling and compact design with safety, pins and sockets being fully shrouded and finger proof. The plug is moulded in polypropylene withstanding greater than average wear. Single hole fixing requires only one nut, a spigot preventing rotation of the socket.

CURRENT RATING: 3 A a.c./d.c. for $<5^{\circ}\text{C}$ temperature rise

CURRENT BREAKING: Satisfactory to B.S. 546 at 3.9 A

BREAKDOWN (d.c.): $>5.5\text{ kV}$

INSULATION RESISTANCE: $>5 \times 10^3$ megohms

CONTACT RESISTANCE (maximum): 5 milliohms

HUMIDITY: A4 (B.S.2011)

TEMPERATURE RANGE: -25°C to $+70^{\circ}\text{C}$

INSERTION/WITHDRAWAL FORCE (maximum): 8 lbf **35 N**

CABLE SIZE (maximum overall): 0.291 inch **7.4 mm**

FIXING TORQUE: 50–200 ozf inch **1.4–0.35 N m**

TERMINATIONS: Plug, screws. Socket, solder or solderless snap-on connectors. 0.110 $\times$ 0.020 inch **2.8 $\times$ 0.51 mm**

PANEL THICKNESS: 0.094–0.188 inch **4.8–2.4 mm**

MATERIALS: Contacts—silver-plated brass.
Insulants—plug, polypropylene; socket, phenolic resin

WEIGHT (average): Plug, **5.2 g** 0.18 oz. Socket, **7.3 g** 0.25 oz

3-POLE MAINS CONNECTOR

L1722/P FREE PLUG

L1722A/S FIXED SOCKET

This connector is a larger version of the L1436 described above. The plug cover retaining screws fit into threaded metal inserts, and the shallow depth socket can be front or rear panel mounting.

CURRENT RATING: 10 A a.c./d.c. for $<5^{\circ}\text{C}$ temperature rise

CURRENT BREAKING: Satisfactory to B.S. 546 at 13 A

BREAKDOWN (d.c.): $>6\text{ kV}$

INSULATION RESISTANCE: $>5 \times 10^3$ megohms

CONTACT RESISTANCE (maximum): 5 milliohms

HUMIDITY: A4 (B.S.2011)

TEMPERATURE RANGE: -10°C to $+55^{\circ}\text{C}$

INSERTION/WITHDRAWAL FORCE (maximum):

11 lbf **50 N** insertion
15 lbf **67 N** withdrawal

CABLE SIZE (maximum overall): 0.375 inch **9.5 mm**

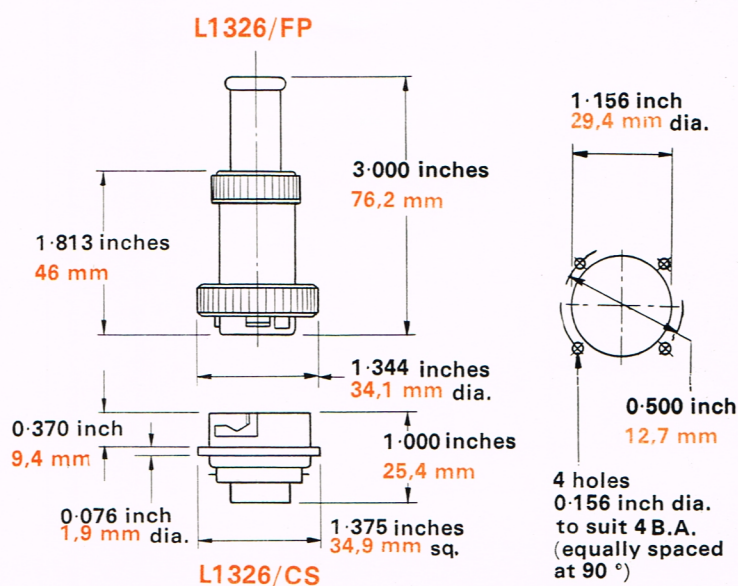
TERMINATIONS: Plug, screws. Socket, solder or solderless snap-on connectors 0.250 $\times$ 0.032 inch **6.3 $\times$ 0.81 mm**

MATERIALS: Contacts—plug, nickel-plated brass
Sockets—silver-plated brass
Insulants—plug, nylon; socket, phenolic resin.

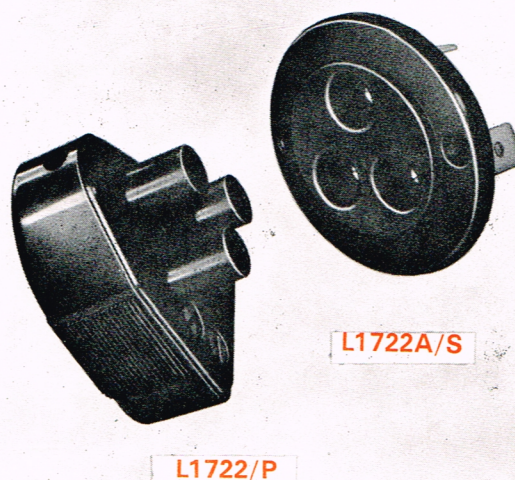
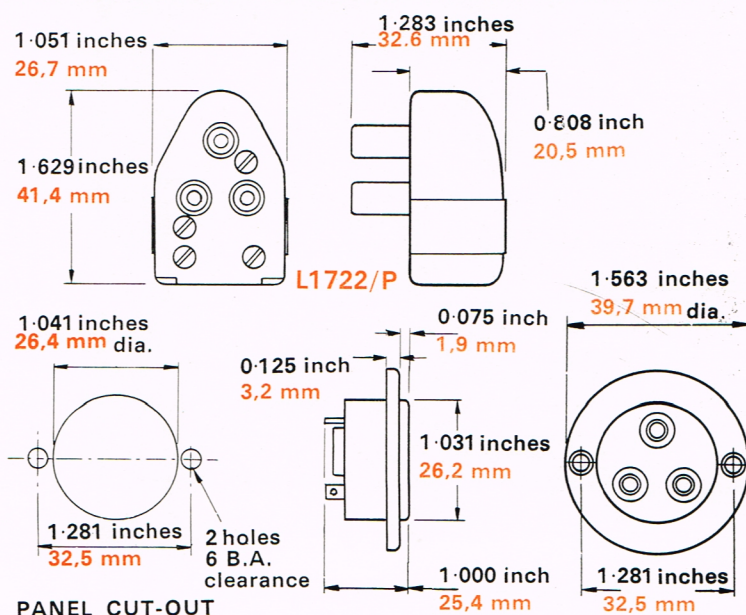
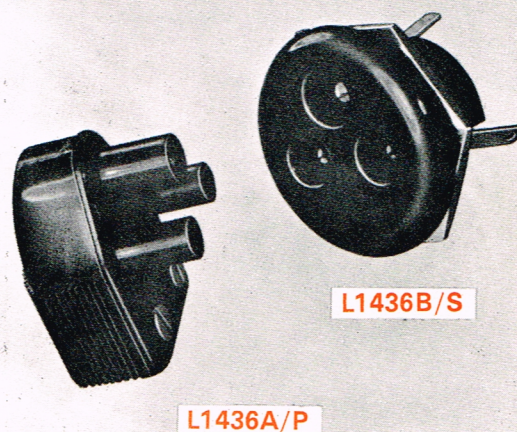
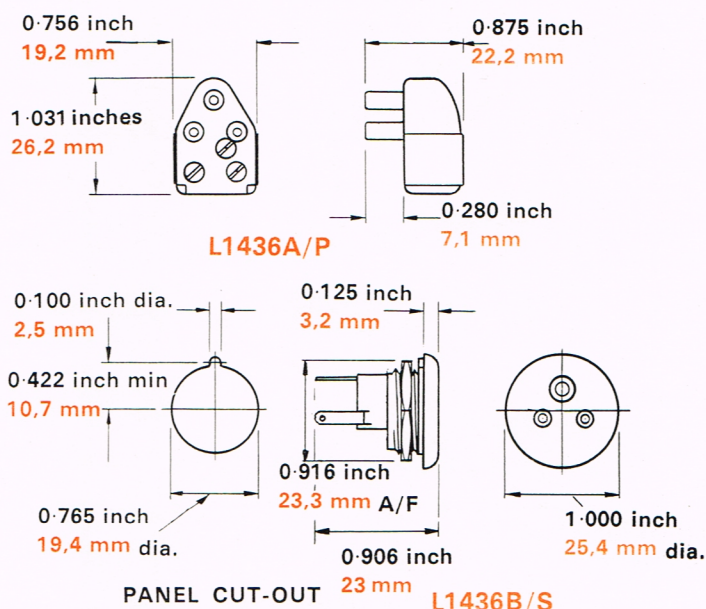
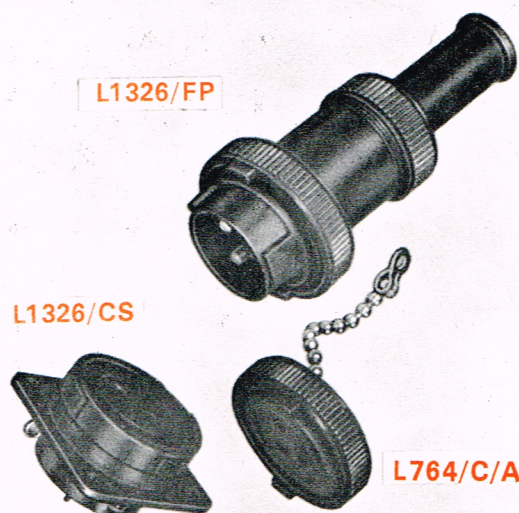
WEIGHT (average): Plug **20.5 g** 0.72 oz. Socket **15.1 g** 0.53 oz



THREE POLE



PANEL CUT-OUT



L F CONNECTORS

L1349 SERIES SEALED 3-POLE O-Z CONNECTORS

L1349/CP FIXED PLUG

L1349/CS FIXED SOCKET

L1349/FP FREE PLUG, STRAIGHT ENTRY

L1349/FS FREE SOCKET, STRAIGHT ENTRY

L1349/RP FREE PLUG, RIGHT ANGLE ENTRY

L1349/RS FREE SOCKET, RIGHT ANGLE ENTRY

These waterproof connectors are resistant to sunlight, mineral oils and grease; the fixed members are also both barrier and panel sealed.

The plugs employ the O-Z contact principle described previously. Originally designed for use in fighting vehicles, these connectors also find world-wide applications in industry and shipping.

BREAKDOWN (d.c.): >5 kV

CURRENT RATING: 7 A for temperature rise <10 °C

INSULATION RESISTANCE: >5×10³ megohms

CONTACT RESISTANCE: 3 milliohms maximum

TEMPERATURE RANGE: -50 °C to +85 °C

HUMIDITY: H6 (DEF 5011)

WATER RESISTANCE: Dry after 1 h in 5 ft 1524 mm of water

SEALING (fixed items): Leakage does not exceed 1 cc/h at 15 lb f/inch² 1 bar

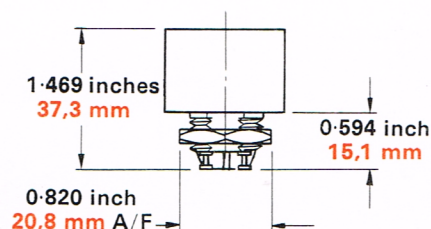
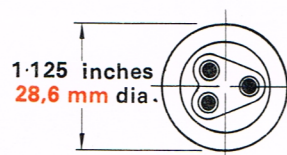
INSERTION/WITHDRAWAL FORCE: 3-15 lb f 110-13 N

PANEL THICKNESS (maximum): 3,2 mm 0.125 inch

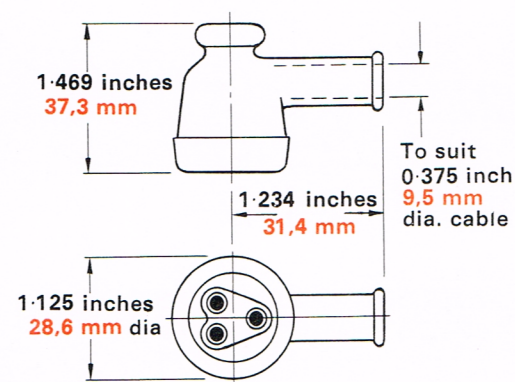
FIXING TORQUE: L1349/CS 1,41-0,79 N m 112-200 ozf inch
L1349/CP 1,46-0,85 N m 120-206 ozf inch

FINISH: Contacts silver-plated

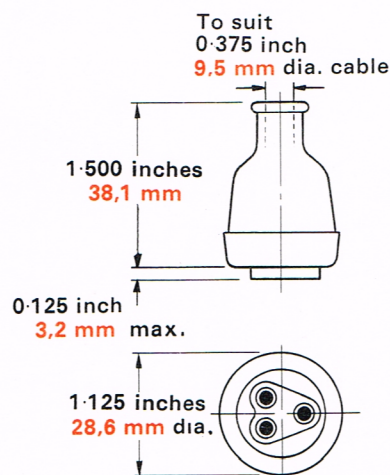
WEIGHT (average): L1349/CP	18,2 g	0.65 oz
L1349/CS	26,1 g	0.92 oz
L1349/FP	23,7 g	0.84 oz
L1349/FS	13,7 g	0.49 oz
L1349/RP	25,5 g	0.90 oz
L1349/RS	18,9 g	0.67 oz



L1349/CS



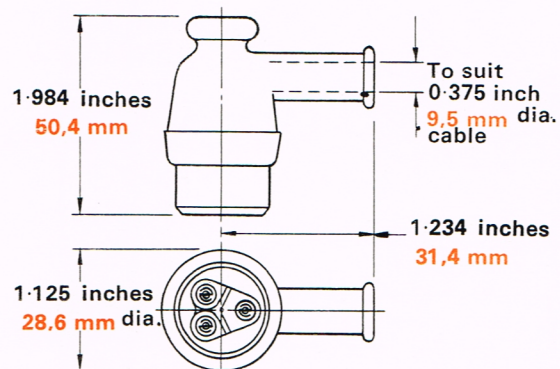
L1349/RS



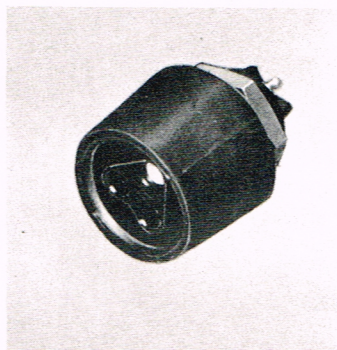
L1349/FS



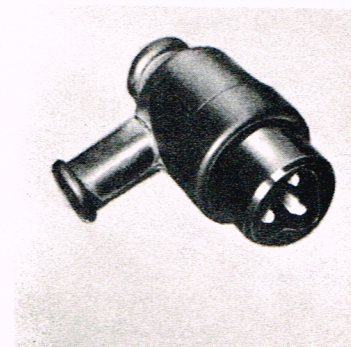
THREE POLE SEALED



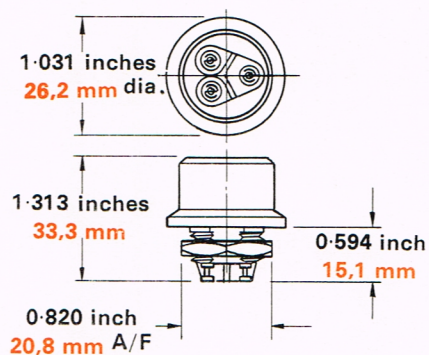
L1349/RP



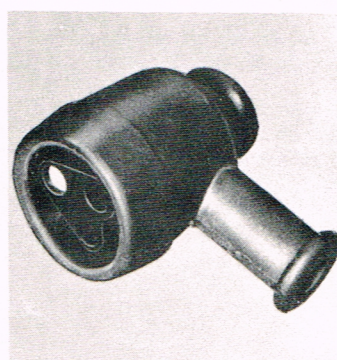
L1349/CS



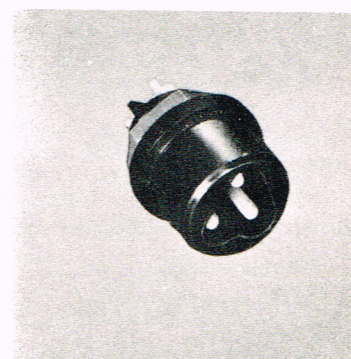
L1349/RP



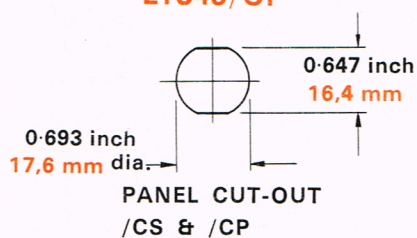
L1349/CP



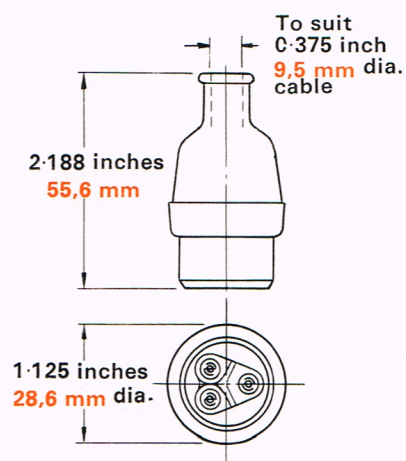
L1349/RS



L1349/CP



PANEL CUT-OUT
/CS & /CP



L1349/FP



L1349/FS



L1349/FP

LF CONNECTORS

MULTI-POLE CONNECTORS

5-POLE

- L1258** FREE PLUG
- L331** FIXED SOCKET
- LO 551** FIXED PLUG
- LO 550** FREE SOCKET

7-POLE

- L530** FREE PLUG
- L726** FIXED SOCKET
- LO 533** FIXED PLUG
- LO 532** FREE SOCKET

10-POLE

- L1244** FREE PLUG
- L332** FIXED SOCKET
- LO 1336** FIXED PLUG
- LO 1335** FIXED SOCKET

A range of robust connectors using the O-Z low contact resistance principle. A central locating key ensures correct mating. Cable connections are made by soldering.

The free members are moulded from black phenolic resin. They have a right angle cable entry and single screw assembly. The fixed members have panels of high grade synthetic resin bonded paper, with common fixing centres throughout the range. These connectors are particularly suitable for supply link connections between chassis in multi-unit and rack-built equipment.

BREAKDOWN VOLTAGE (d.c.): >4 kV

CURRENT RATING: 5 A

INSULATION RESISTANCE: >10 × 10⁸ megohms

CONTACT RESISTANCE (maximum): 1 milliohm

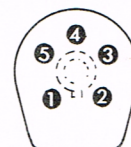
TEMPERATURE RANGE: -40 °C to +85 °C

INSERTION/WITHDRAWAL FORCE (approximate):
4.45 N 1 lbf per pole

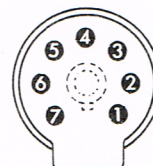
CABLE SIZE: 5-pole 0.438 inch 11.1 mm
7 and 10-pole 0.5 inch 12.7 mm

FINISH: Contacts silver-plated

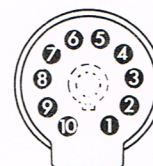
WEIGHT: 5-pole L1258 31.4 g 1.11 oz
L1331 12.3 g 0.43 oz
5-pole LO 551 11.5 g 0.41 oz
LC 550 27.1 g 0.96 oz
7-pole L530 38 g 1.34 oz
L726 13.7 g 0.49 oz
7-pole LO 533 14.2 g 0.5 oz
LO 532 34.3 g 1.21 oz
10-pole L1244 38.7 g 1.37 oz
L332 16.9 g 0.6 oz
10-pole LO 1336 18.7 g 0.66 oz
LO 1335 38.3 g 1.36 oz



L1258
5 POLE



L530
7 POLE

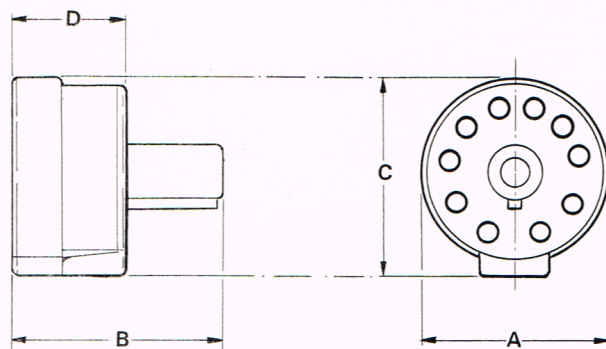
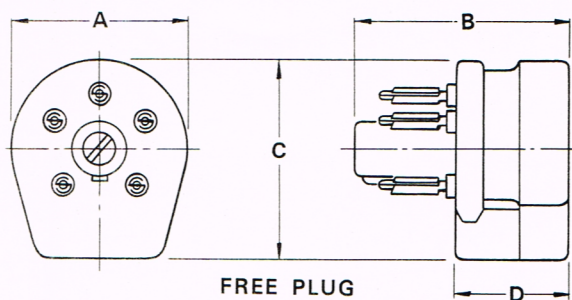


L1244
10 POLE

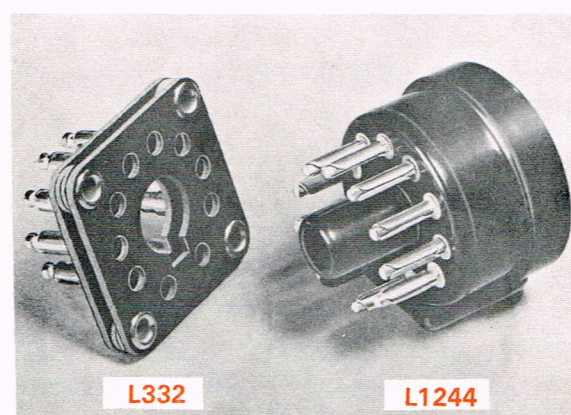
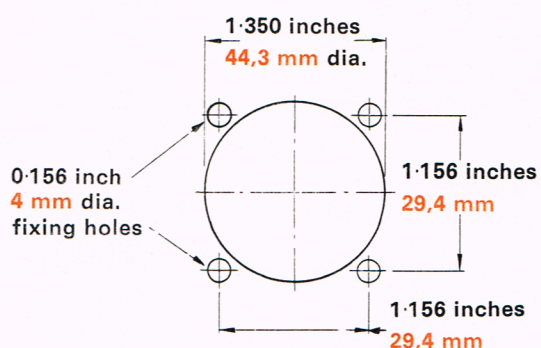
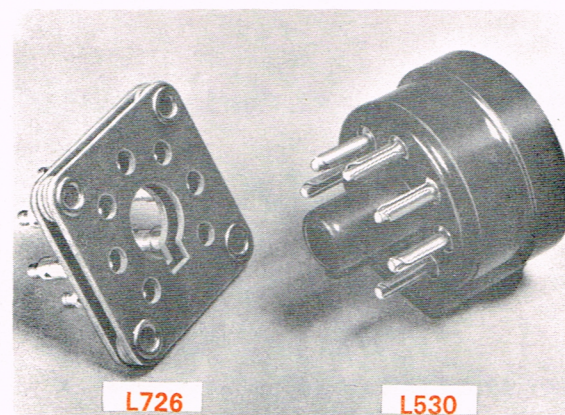
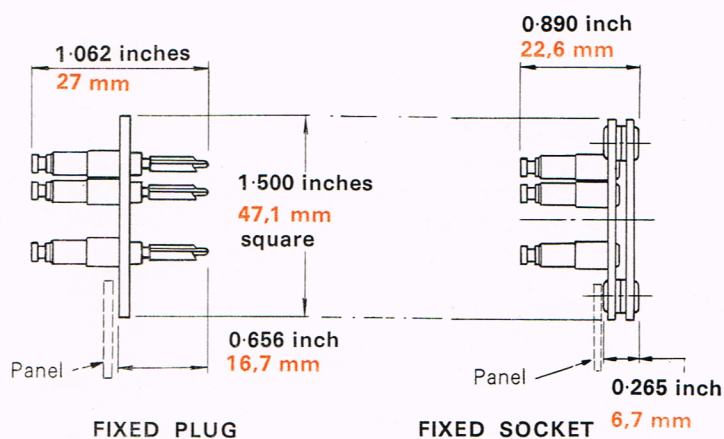
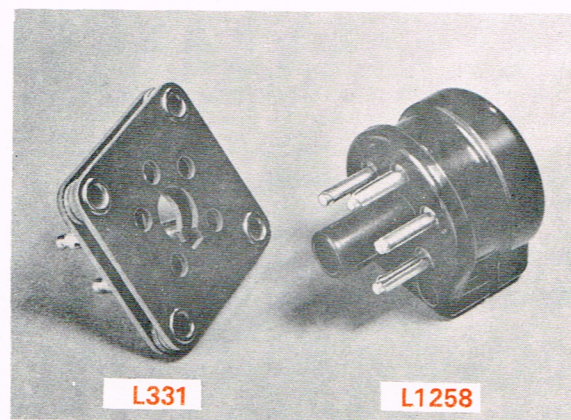
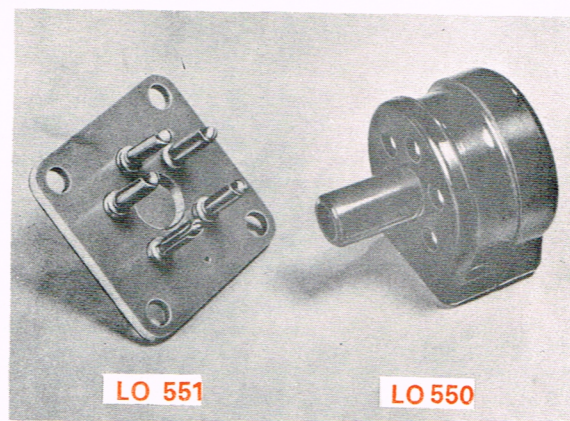
CONTACT IDENTIFICATION
Viewed on wiring side



MULTI - POLE



TYPE	A	B	C	D
	inch mm	inch mm	inch mm	inch mm
5-POLE	1.313 33,3	1.641 41,7	1.469 37,3	0.875 22,2
7 & 10 POLE	1.563 39,7	1.625 41,3	1.656 42,1	0.938 23,8



L F CONNECTORS

MINIATURE UNITORS

L1387/P/Ag OR Au PLUG, 8 POLE, FOUR LARGE AND FOUR SMALL

L1387/S/Ag OR Au SOCKET, 8 POLE, FOUR LARGE AND FOUR SMALL

L1388/P/Ag OR Au PLUG, 8 POLE, SMALL

L1388/S/Ag OR Au SOCKET, SMALL

L1389/P/Ag OR Au PLUG, SMALL

L1389/S/Ag OR Au SOCKET, SMALL

Smaller, lighter, but equal in performance to pattern 102 Unitors* this range includes r.f. and high voltage connectors, and all units are physically interchangeable.

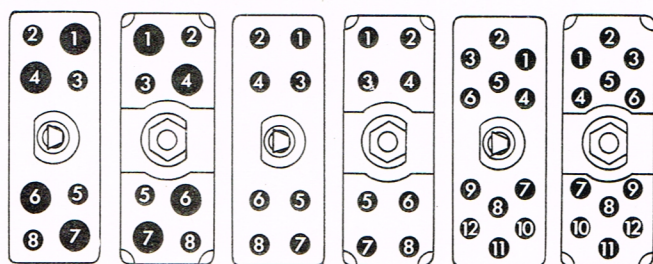
A special feature of this series is the central earthing contact, which also fulfils the functions of mating, locating and polarization, and fixing.

The unitors may be mounted directly on panels and chassis or, if preferred, shrouds are available to accommodate one, two or three units (see pages 19 and 20). Raised flats on the mating faces of the mouldings ensure an adequate gap through which air can circulate to dispel moisture.

*see pages 21 and 22

CONTACT IDENTIFICATION

Viewed on mating faces



L1387/P **L1387/S** **L1388/P** **L1388/S** **L1389/P** **L1389/S**

CURRENT RATING: Small poles, 9A Large poles, 10A
(temperature rise $\leq 10^{\circ}\text{C}$)

BREAKDOWN (d.c.): Mounted in shrouds L1470-1-2

	L1387	L1388	L1389
(a) at sea-level	>2.5 kV	>2.5 kV	>2 kV
(b) at 20 000 m 68 000 ft	1 kV	1 kV	700 V

PINS TO EARTH:

(a) at sea-level	2.5 kV	2.5 kV	2 kV
(b) at 20 000 m 68 000 ft	900 V	900 V	600 V

CONTACT RESISTANCE (Max.): Small poles 2 milliohms
Large poles 1 milliohm
Locating key 5 milliohms

INSULATION RESISTANCE: $>100 \times 10^3$ megohms

TEMPERATURE RANGE: -40°C to $+100^{\circ}\text{C}$

HUMIDITY: Class H5 (DEF-5011)

WITHDRAWAL FORCE (max.): **2.1 N** 7.5 ozf per pole

WIRE SIZES: Small poles, 0.042 inch or 19 s.w.g. **1.1 mm**
Large poles, 0.079 inch or 15 s.w.g. **2 mm**

PANEL THICKNESS:

Plugs, up to 0.125 inch **3.2 mm** No limits in shrouds
Sockets, up to 0.064 inch **1.6 mm**

FIXING TORQUE: **0.18 N m** 25 ozf in

MATERIALS: Body, phenolic resin moulding
Pins, brass Sockets, beryllium-copper
Silver or gold-plated (Suffix Ag or Au, respectively)

WEIGHT (average): L1387 **8.4 g** 0.30 oz
(mated pair) L1388 **7.1 g** 0.25 oz
L1389 **8.7 g** 0.31 oz

MINIATURE UNITOR HIGH VOLTAGE 2-POLE L1390/P & S

L1390/P/Ag and Au Plug

L1390/S/Ag and Au Socket

CURRENT RATING: 10 A (temperature rise $\leq 10^{\circ}\text{C}$)

BREAKDOWN VOLTAGE (d.c.): At sea-level At 18 000
60 000 ft

pole/pole	>10 kV	>2 kV
poles/chassis	>6 kV	>1 kV

INSULATION RESISTANCE: $>10 \times 10^3$ megohms

CONTACT RESISTANCE: 1 milliohm maximum
(5 milliohms locating key)

TEMPERATURE RANGE: -40°C to $+100^{\circ}\text{C}$

WITHDRAWAL FORCE: **13.7—7.8 N** 1.75—3 lbf

WIRE SIZE: 0.079 inch **2 mm** or 15 s.w.g.

PANEL THICKNESS (max.): Plug 0.125 inch **3.2 mm**
Socket 0.064 inch **1.6 mm**
No limit in shrouds

FIXING TORQUE: **0.18 N m** 25 ozf in

MATERIALS: Body, epoxy resin
Plug, pins silver (Ag) or gold-plated (Au) brass.
Sockets, Silver (Ag) or gold-plated (Au) beryllium-copper.

WEIGHT (average): Plug or socket, **4.1 g** 0.14 oz

MINIATURE UNITOR COAXIAL TWIN L1580/P & S

L1580/P/Ag and Au Plug

L1580/S/Ag and Au Socket

IMPEDANCE: 50 ohms nominal

BREAKDOWN VOLTAGE (d.c.): At sea-level >3 kV
At **18 000 m** 60 000 ft
 >1 kV

INSULATION RESISTANCE: $>10^3$ megohms

CONTACT RESISTANCE (maximum): 5 milliohms (all)

CABLE SIZE: Inner, 0.04 inch **1 mm**
Outer, 0.18 inch **4.5 mm**

PANEL THICKNESS (max.) Plug, 0.125 inch **3.2 mm**
Socket, 0.064 inch **1.6 mm**
No limit in shrouds

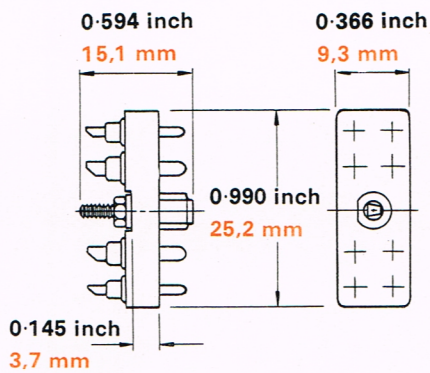
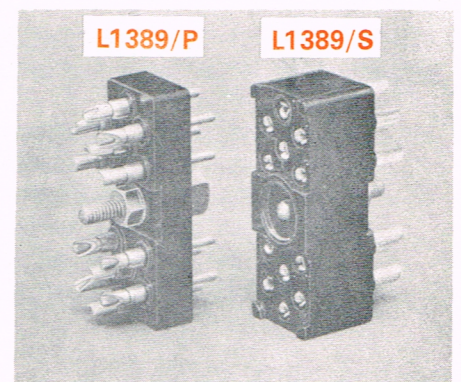
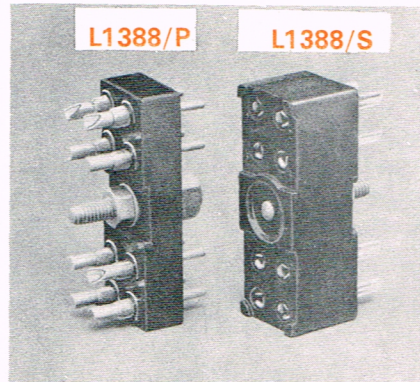
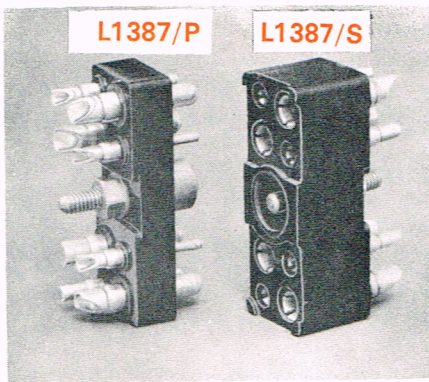
FIXING TORQUE: **0.18 N m** 25 ozf in

MATERIALS: Bodies and pins, silver (Ag) or gold-plated (Au) brass.
Socket inserts, beryllium-copper, silver (Ag) or gold-plated (Au)
Dielectric, polyethylene
Moulding, phenolic resin

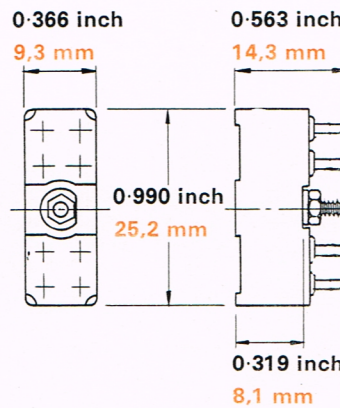
WEIGHTS (average): Plug or socket, **7.6 g** 0.27 oz



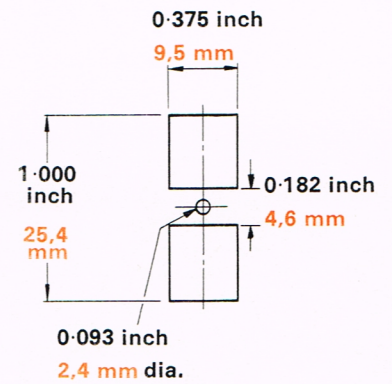
MINIATURE UNITORS



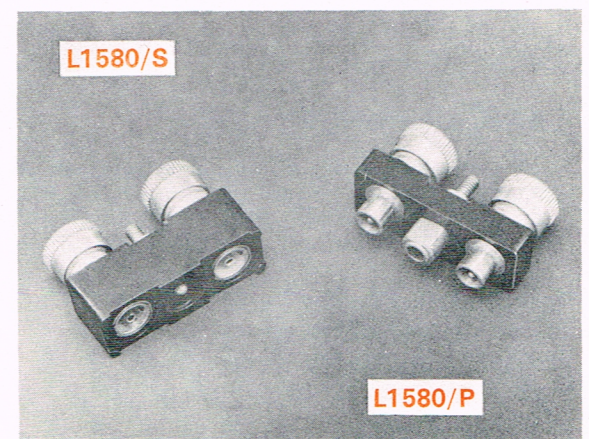
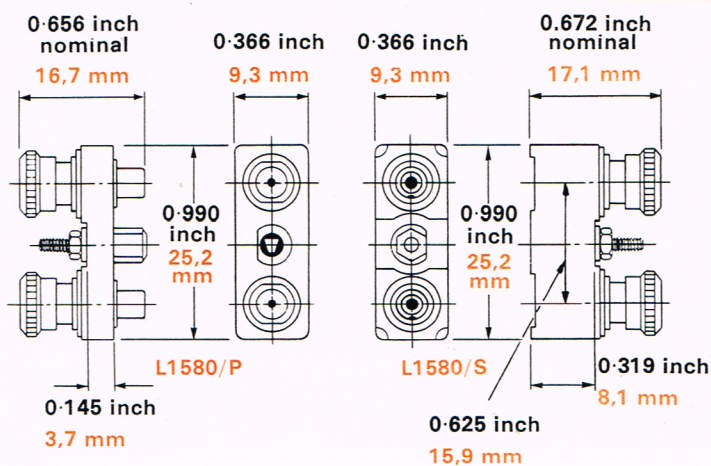
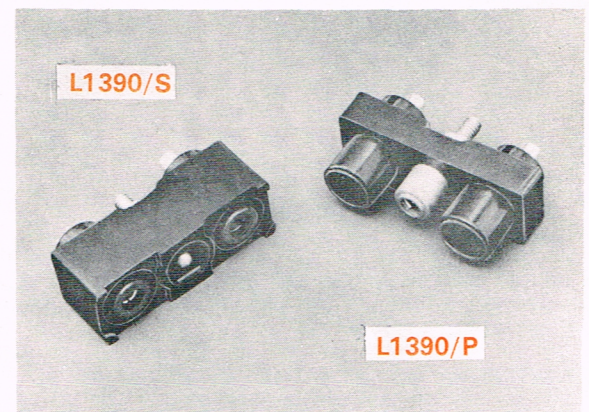
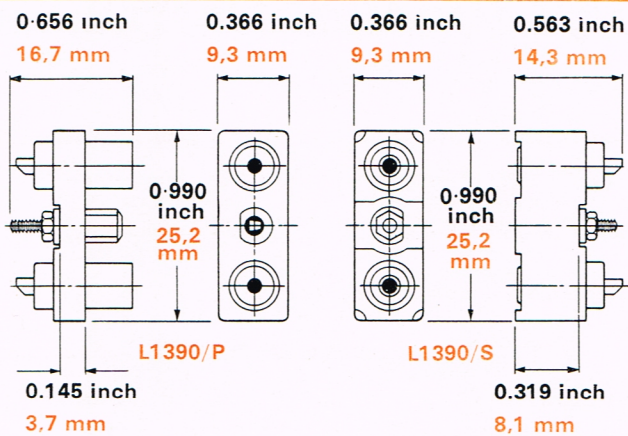
PLUGS



SOCKETS



PANEL CUT-OUT



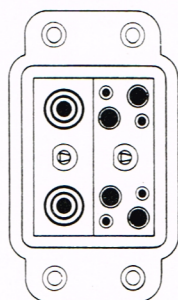
L F CONNECTORS

MINIATURE UNITOR ACCESSORIES— FLUSH AND SURFACE MOUNTING SHROUDS

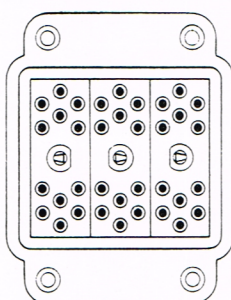
- L1470/F** SINGLE FLUSH MOUNTING SHROUD
- L1470/S** SINGLE SURFACE MOUNTING SHROUD
- L1471/F** DOUBLE FLUSH MOUNTING SHROUD
- L1471/S** DOUBLE SURFACE MOUNTING SHROUD
- L1472/F** TREBLE FLUSH MOUNTING SHROUD
- L1472/S** TREBLE SURFACE MOUNTING SHROUD

These metal Shrouds can be used for mounting one, two or three Miniature Unitors on a plug-in unit and on the equipment rack.

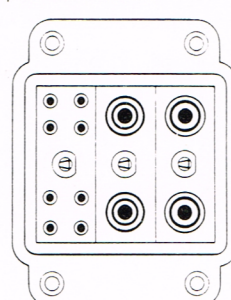
All BELLING-LEE Miniature Unitors have a common face area and central fixing point, and are therefore physically interchangeable. In addition they are polarized, so that each unit can be mounted in two alternative ways on any site. Thus, from a few basic units it is possible to assemble a very large variety of non-interchangeable multiple connectors.



An L1390 and L1387 side-by-side in a double shroud.



Three L1389 Miniature Unitors giving 36 poles in an area of only 1.32 square inches.
Note: The arrangement of the polarizing keys, one of 8 possible variations.



L1388, L1390, and L1580 side-by-side, enabling power supplies and r.f. or pulse signals to be grouped together in one unit.

L1588/C MINIATURE UNITOR CABLE OUTLET

This moulded cable outlet accommodates any member of the Miniature Unitor range, plug or socket, permitting cable connection to the appropriate fixed unit.

CABLE ENTRY SIZE: 0.375×0.250 inch 9.5×6.4 mm

MATERIAL: Butyrate

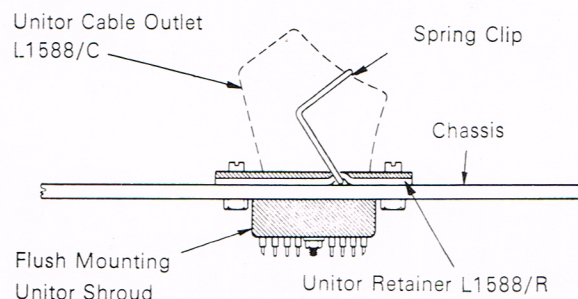
WEIGHT (average): 9.2 g 0.32 oz

L1588/R MINIATURE UNITOR RETAINER

This retainer is intended for use with flush mounted fixed members, and is secured between the flange of the unitor shroud and the panel, using common fixing screws.

MATERIAL: Base-plate, brass, cadmium-plated
Retaining clip, spring steel

WEIGHT (average): 23.1 g 0.81 oz



L1570/Ag or /Au COAXIAL SHORTING LINK

This coaxial shorting link is designed to plug into the socket member (L1580/S) of the Miniature Unitor range. Alternatively, a pair of miniature coaxial sockets, L1465C/CS, may be used spaced on 0.625 inch 15.9 mm centres.

IMPEDANCE: 50 ohms nominal

INSERTION RESISTANCE: <10 milliohms

SCREEN CONTINUITY: <10 milliohms

INSULATION RESISTANCE: >10⁸ megohms

CAPACITANCE (maximum): 4 pF

BREAKDOWN VOLTAGE (d.c.): >1.5 kV

INSERTION/WITHDRAWAL FORCE (maximum):
80 N 18 lb f

MATERIAL: Body and contacts, brass
Insulant, polypropylene and air

FINISH: Gold (Au), or silver-plated (Ag)

WEIGHT (average): 23.1 g 0.81 oz

LF CONNECTORS



MINIATURE SINGLE POLE
SINGLE POLE
TWO POLE
THREE POLE
MULTI-POLE
MINIATURE UNITORS AND
ACCESSORIES
PATTERN 102 UNITORS
AND ACCESSORIES
REMOVABLE CONTACT UNITORS
PRINTED CIRCUIT EDGE
CONNECTORS
RIBBON CABLE CONNECTORS
FLEXICON

DIMENSIONS (unless otherwise stated)
Panel cut-outs minima, normal tolerance ± 0.005 inch.
Overall sizes and fixing centre nominal.
First dimension is design dimension.
Second is the nearest imperial or metric equivalent.

CURRENT RATINGS/TEMPERATURE RISE.
Where stated, the temperature rise figure given
is above ambient (20 °C).

L F CONNECTORS

MINIATURE SINGLE POLE CONNECTORS

L1526/Ag OR Au/COLOUR. PRINTED CIRCUIT SOCKET

L1527/Ag OR Au/COLOUR. STACKING PLUG

L1528/Ag OR Au/COLOUR. FREE PLUG, TOP ENTRY

L1529/Ag OR Au/COLOUR. FIXED SOCKET

L1530/Ag OR Au/COLOUR. PRINTED CIRCUIT SOCKET

L1531/COLOUR. PRINTED CIRCUIT SOCKET WITH RIGHT ANGLE TAG

L1569/COLOUR. PRINTED CIRCUIT SOCKET WITH RIGHT ANGLE TAG AND MOUNTING STIRRUP

L1642/Ag OR Au/COLOUR. FREE SOCKET

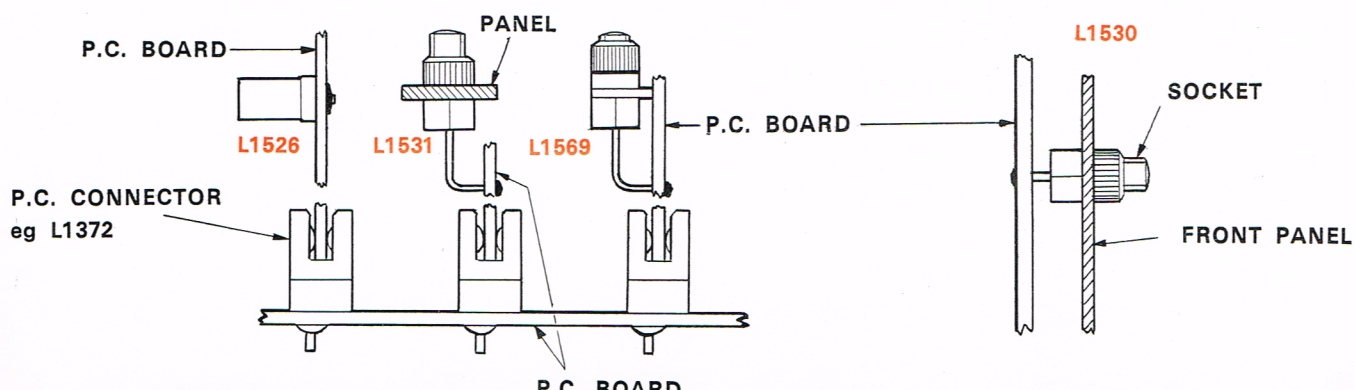
LY20042/Ag OR Au/COLOUR. PRESS FITTING SOCKET

(Similar to L1526 but with moulded flange at opposite end).

These miniature connectors meet all requirements of designers of modern electronic equipment combining robustness with small dimensions.

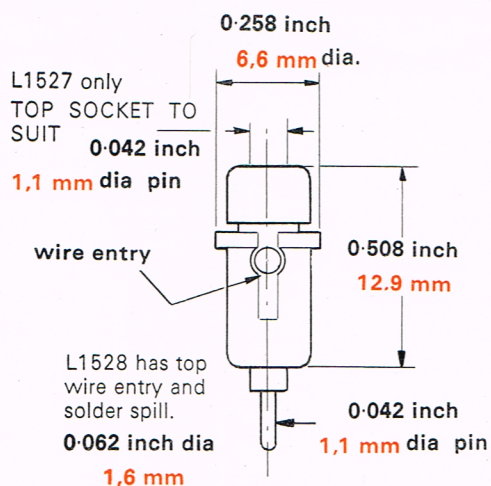
Available in a range of six standard colours.

	L1526 LY20042	L1527	L1528	L1529	L1530	L1531	L1569	L1642
CURRENT RATING:	5 A ALL TYPES							
CONTACT RESISTANCE:	≤ 3.5 milliohms ALL TYPES							
BREAKDOWN VOLTAGE (d.c.): sea level 18 000 m 60 000 feet	7 kV 1.5 kV	— —	— —	9 kV 2 kV	10 kV 2 kV	10 kV 2 kV	3 kV 0.8 kV	— —
INSULATION RESISTANCE:	≥ 100 × 10 ⁹ megohms ALL TYPES							
CREEPAGE DISTANCE:	5 mm 0.197 inch L1642 2.2 mm 0.086 inch							
WITHDRAWAL FORCE (min): mated with L1528	5.5 ozf 0.15 N	2.5 ozf 0.07 N	— —	9.5 ozf 0.26 N	9.5 ozf 0.26 N	9.5 ozf 0.26 N	9.5 ozf 0.26 N	14.5 ozf 0.4 N
PANEL THICKNESS:	0.020—0.125 in	3.2 mm—0.5 mm (L1529, L1530, L1531 only). LY20042 0.166 inch maximum						4.2 mm
FIXING TORQUE:	—	—	—	4.0—7.5 ozf in 0.053—0.028 N m				—
WIRE ENTRY:	—	0.035 inch 0.89 mm	0.076 inch 1.9 mm	—	—	—	—	0.095 inch 2.4 mm
CONDUCTOR SIZE (max.):	—	0.035 inch 0.89 mm	0.060 inch 1.5 mm	—	—	—	—	0.095 inch 2.4 mm
MATERIALS:	Polypropylene mouldings. Inserts, L1526 LY20042 beryllium-copper, remainder brass. L1531 and L1569 gold plated (Au) contacts only. Remainder of range available with gold (Au) or silver (Ag) plated contacts.							
COLOURS:	Black, Blue, Green, Red, White and Yellow							
WEIGHT (average):	0.013 oz 0.3 g	0.023 oz 0.65 g	0.028 oz 0.79 g	0.015 oz 0.43 g	0.013 oz 0.37 g	0.013 oz 0.37 g	0.023 oz 0.65 g	0.023 oz 0.65 g

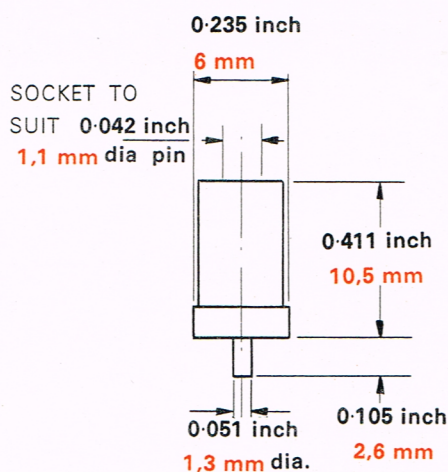




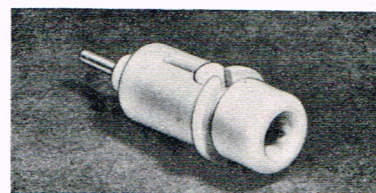
MINIATURE SINGLE POLE



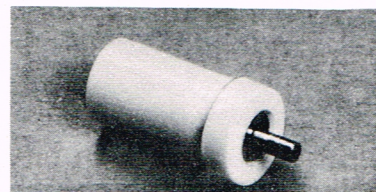
**L1527
L1528**



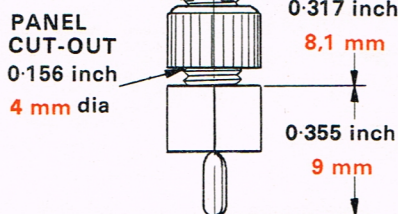
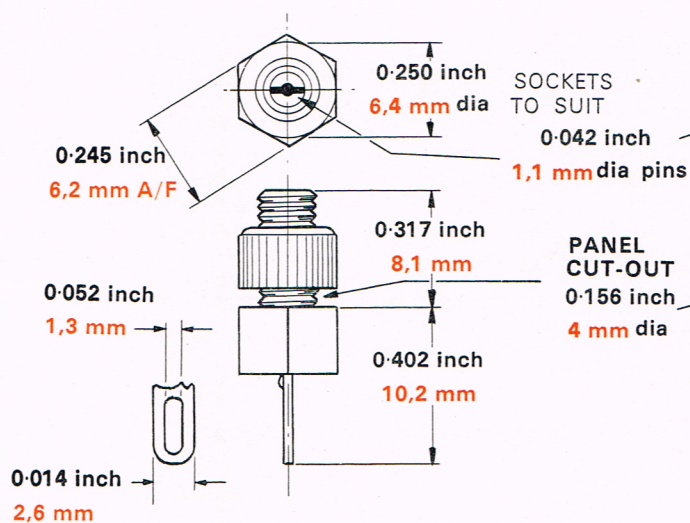
L1526



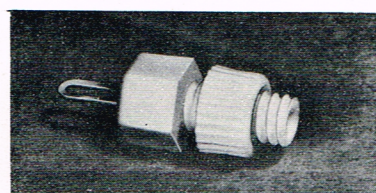
**L1527
L1528**



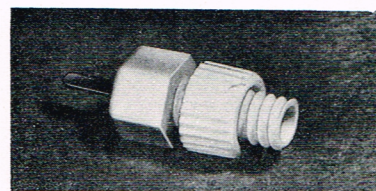
L1526



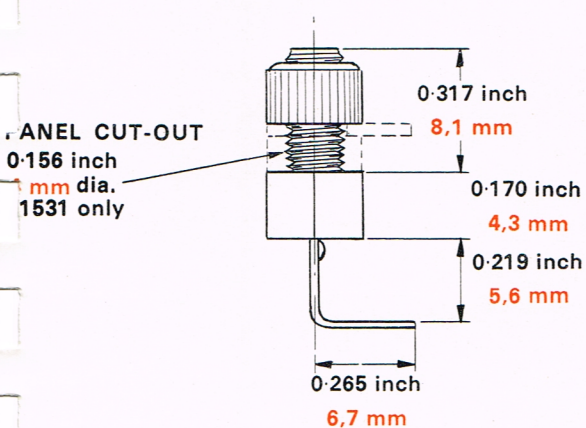
L1530



L1529

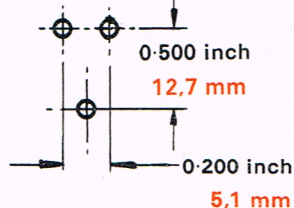


L1530

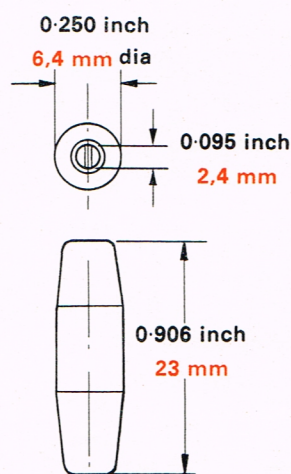


L1531 without dotted portion
L1569 includes dotted portion

holes
0.052 inch dia.
1.3 mm

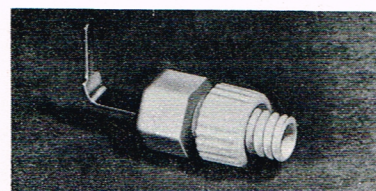


BOARD DRILLING FOR L1569

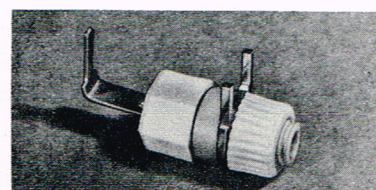


L1642

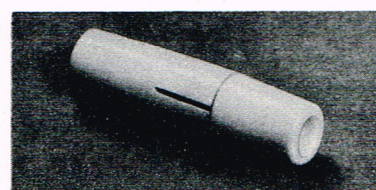
BOARD DRILLING
L1526, L1530,
L1531 only
0.052 inch
1.3 mm



L1531



L1569



L1642

L F CONNECTORS

SINGLE POLE CONNECTORS 2 mm

L1727/ COLOUR. FREE PLUG, END ENTRY

L1736/ COLOUR. STACKING PLUG

L1737/ COLOUR. FIXED SOCKET

These miniature connectors are extremely robust, have a current rating of 10 amp, and are simple to load, with a choice of six standard colours. The plugs are in two styles, each with a snap-on cover, one end-loading and the other having a socket in the end for a test probe or stacking a further plug. An insulated panel mounting socket L1737 completes the range. A complimentary series of terminals, L1726/104, is illustrated in the red section of this catalogue.

	L1727/ COLOUR	L1736/ COLOUR	L1737/ COLOUR
CURRENT RATING:	10 A for temperature rise <10 °C		
CONTACT RESISTANCE:	≤ 3 milliohms.		
BREAKDOWN VOLTAGE:	> 4 kV		
INSULATION RESISTANCE:	≥ 20 × 10 ³ megohms		
TEMPERATURE RANGE:	-40 °C to +50 °C (+65 °C at 5 A maximum)		
FIXING TORQUE (maximum):	0.32 N m 45 ozf in.		
PANEL THICKNESS:	0.031-0.187 inch 4.76 - 0.79 mm		
WIRE SIZE, OVERALL (max):	0.121 inch 3.1 mm	0.079 inch 2 mm	
WIRE SIZE, CONDUCTOR (max):	0.070 inch 1.8 mm	0.079 inch 2 mm	
CONNECTION :	Crimp or solder	Non-cutting screw	Solder
INSULANT:	PVC	PVC	Polypropylene
COLOURS:	Black, Blue, Green, Red, White and Yellow		
WEIGHT (average):	0.95g 0.03 oz	3.36 g 0.12 oz	1.66 g 0.06 oz

THE O-Z PRINCIPLE

Devised for a particularly low resistance heavy current contact the O-Z principle of plug design is now firmly established as a method of ensuring a multi-point contact which will not jump out under vibration. Millions of plugs employing this principle are now in service. O-Z plug pins feature a phosphor-bronze

spring leaf welded into the split stem ensuring that the contact resistance is virtually unaffected when used with wide tolerance sockets. The mating length of the pin in the standard L series is 0.5 inch 12.7 mm; in the E type connectors the pin length is 20 mm, as commonly used on the continent.

SINGLE POLE CONNECTORS 3 mm

L378A/3/ COLOUR. PLUG

L1317/ COLOUR. SOCKET (SQUARE FACE)

L1412/ COLOUR. SOCKET (ROUND FACE)

These connectors are complimentary to the 4 mm range on pages 5 and 6.

CURRENT RATING: 10 A (temperature rise <10 °C)

CONTACT RESISTANCE: ≤ 2 milliohms

TEMPERATURE RANGE: -55 °C to +85 °C

INSULATION RESISTANCE: ≥ 10³ megohms.

VOLTAGE BREAKDOWN (sockets): ≥ 5 kVd.c.

INSERTION/WITHDRAWAL FORCE: 1.5 to 4 lbf

17.8 to 6.67 N

depending on type of socket

CONDUCTOR SIZE (maximum): L/38A/3 56/0.3 mm

PANEL THICKNESS (maximum):

L1412—0.187 inch 4.8 mm

L1317—0.275 inch 7 mm

FIXING TORQUE

(maximum sockets): 60-80 ozf in 0.565-0.424 N m

MATERIALS: Contact body: Brass, silver plated.

Contact leaf (L378A/3): Phosphor-bronze silver-plated. Insulant: Polypropylene.

COLOURS: Black, Blue, Green, Red, White and Yellow

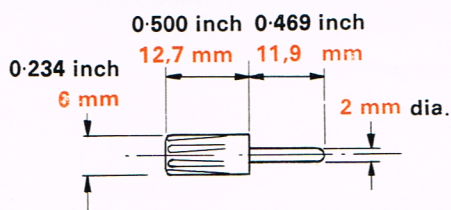
WEIGHT (average): L378A/3—4.5 g 0.16 oz

L1317 —2.8 g 0.1 oz

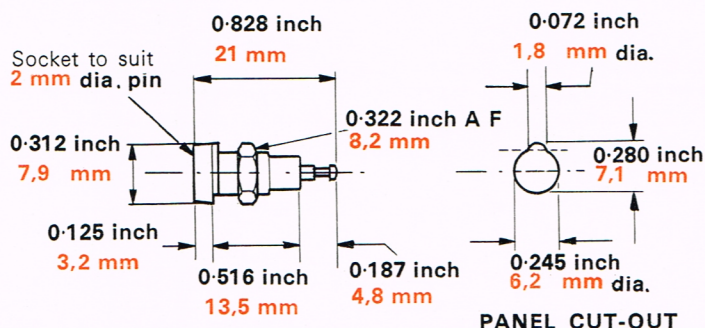
L1412 —1.9 g 0.07 oz



SINGLE POLE

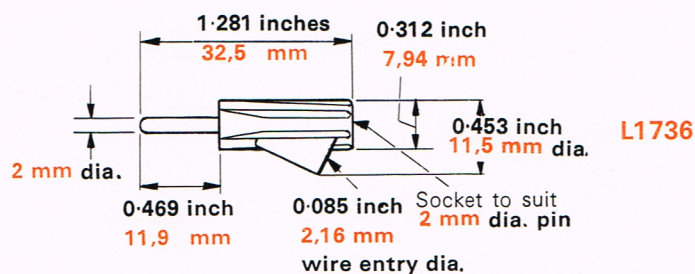


L1727

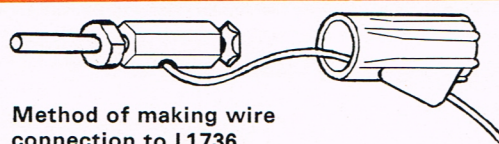


L1737

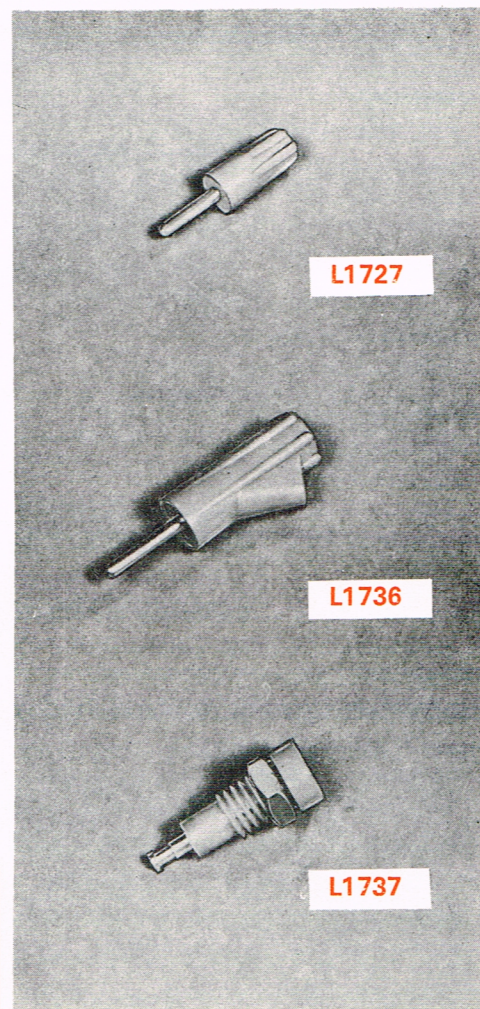
PANEL CUT-OUT



L1736



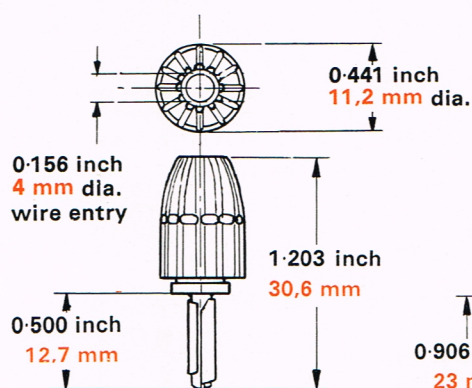
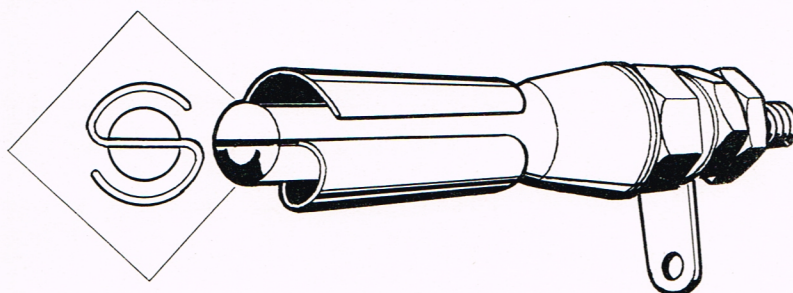
Method of making wire connection to L1736



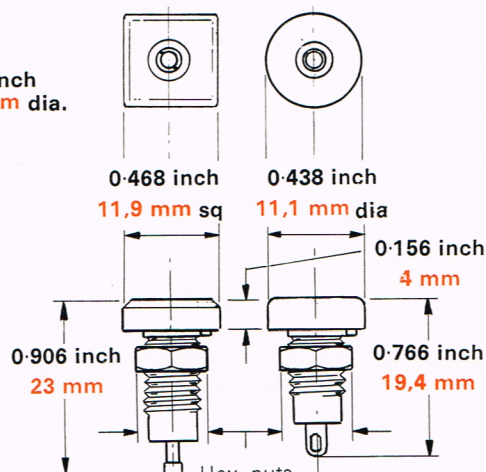
L1727

L1736

L1737

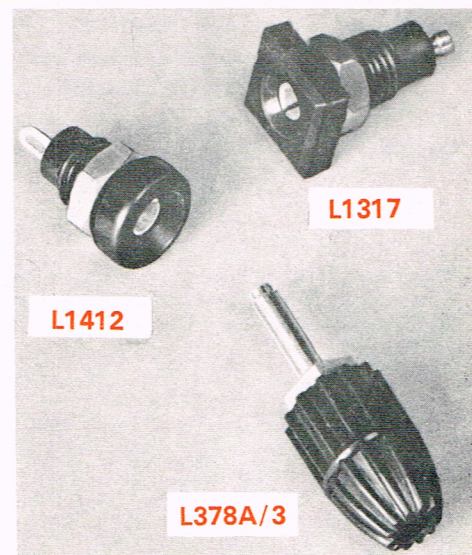


L378A/3



L1317
(Square)

L1412
(Round)



L1412

L1317

L378A/3

L F CONNECTORS

SINGLE POLE CONNECTORS, 4 mm

PLUGS

L378A/4/COLOUR. CLAMP OR SOLDER CONNECTION

L1706/ COLOUR. TWIN STACKING PLUG

L1708/ COLOUR. SINGLE STACKING PLUG

L1716A/COLOUR. CRIMP OR SOLDER CONNECTION

CRIMP TOOL

ERMA BUCHANAN 611210
WITH POSITIONER 7005545
AND SETTING GAUGE 600076

SOCKETS

L1318/ COLOUR. SQUARE FACE, RESILIENT

L1413/ COLOUR. ROUND FACE, RESILIENT

L1717/ COLOUR. ROUND FACE, NON RESILIENT

L1718/ COLOUR. SQUARE FACE, NON RESILIENT

Stacking Plugs L1706 and L1708 permit additional apparatus to be rapidly connected to a circuit without disturbing the existing connections. Any number can be plugged together, and they will mate with all standard 4mm solid and resilient sockets and also with all Belling-Lee terminals that incorporate an appropriate socket in the head. Wire connection via the side port is secured by means of a grub screw located in the bottom of the socket; the end of this screw is specially shaped so as not to cut the conductors. The plug, type L1716A is an extremely versatile component of low cost. It is quickly loaded by crimping or soldering the wire to the plug-pin, and the elastic cover then snaps into position. Its small size is of great convenience in modern miniaturised equipment and when plugged into the recessed head of the miniature Continental terminal, the plug-pin is fully shrouded and is not jacked out by unscrewing the head.

CURRENT RATING: 10 A (temperature rise <10 °C)

CONTACT RESISTANCE: <2 milliohms

INSULATION RESISTANCE: $\geq 10^3$ megohms

VOLTAGE BREAKDOWN (Sockets): >5 kV d.c.

TEMPERATURE RANGE: -55 °C to +85 °C (L1716A +70°C)

CONDUCTOR SIZES L378A/4 E6008 56/0.3 mm
(maximum):

L1706 L1708 50/0.25 mm
E6015 E6016

L1716A 32/0.2 mm

PANEL THICKNESS L1413 0.187 inch 4.8 mm
(maximum):

L1318 L1717 L1718 0.275 inch
E6013 E6014 7 mm

FIXING TORQUE (Sockets): 60-80 ozf inch 0.565-0.424 Nm

MATERIALS: Contact body—Brass, silver-plated
Contact leaf—Phosphor-bronze, silver-plated

INSULANT: L1716A—PVC, remainder Polypropylene

COLOURS: Black, Blue, Green, Red, White and Yellow

WEIGHT (average):

L378A/4	5 g	0.17 oz
L1318	2.8 g	0.1 oz
L1413	1.9 g	0.07 oz
L1706	19.2 g	0.68 oz
L1708	9.3 g	0.33 oz
L1716A	2.1 g	0.075 oz
L1717	2.7 g	0.096 oz
L1718	2.8 g	0.1 oz

SINGLE POLE CONNECTORS CONTINENTAL RANGE 4 mm

PLUGS

E6008/COLOUR. CLAMP OR SOLDER CONNECTION

E6015/COLOUR. STACKING PLUG

E6016/COLOUR. TWIN STACKING PLUG

SOCKETS

E6013/COLOUR. ROUND FACE

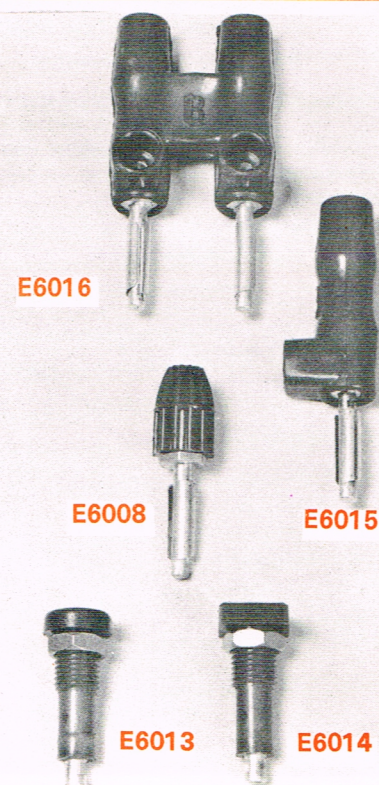
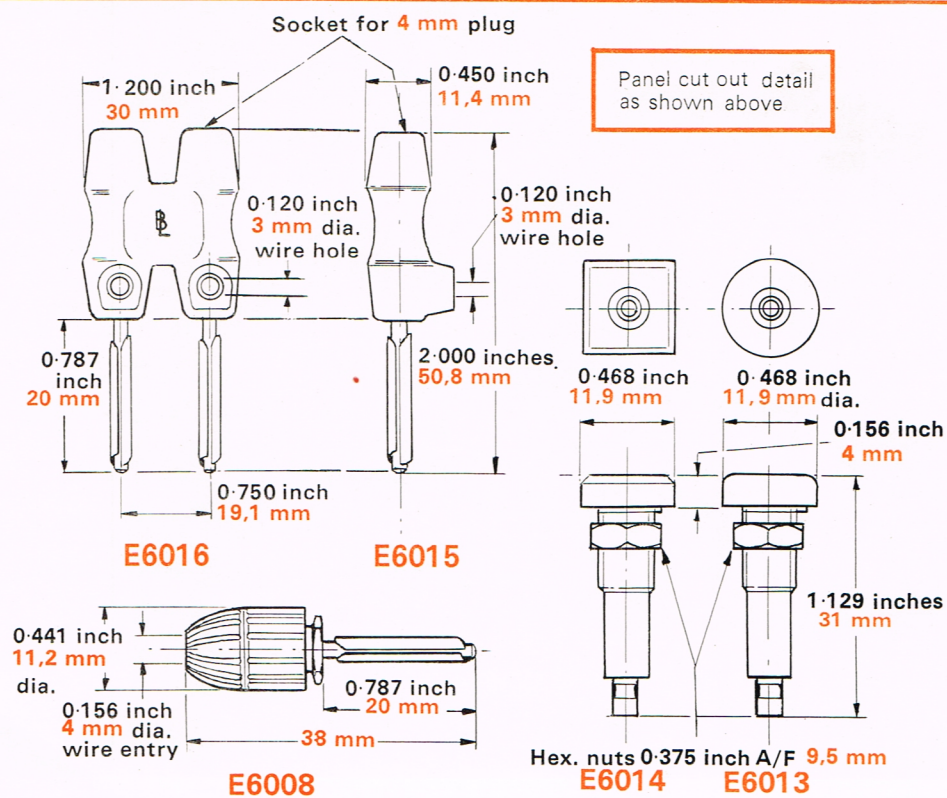
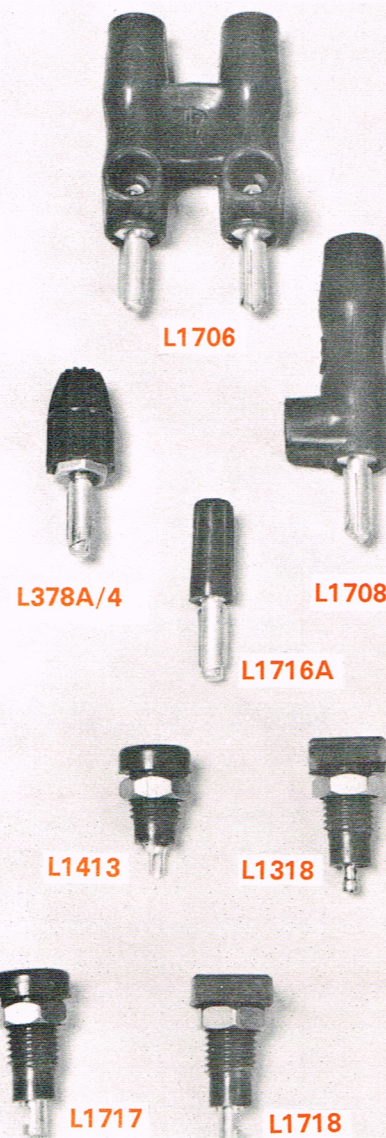
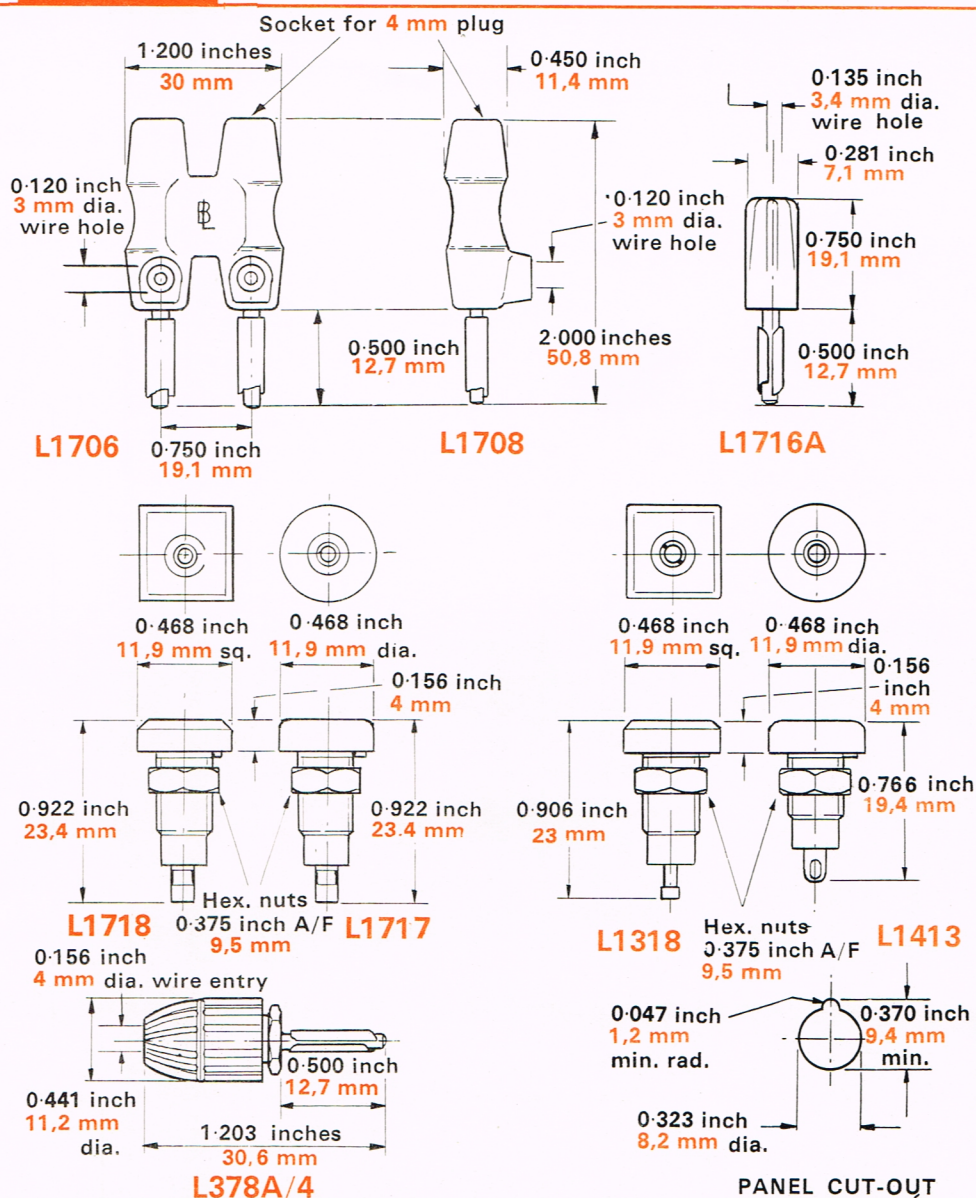
E6014/COLOUR. SQUARE FACE

This range is similar to the items shown above but with an extended plug length and socket depth to suit continental requirements.

Technical information as in 4 mm range above



SINGLE POLE



L F CONNECTORS

SINGLE POLE UNINSULATED O-Z PLUGS

L513, L514, L515, L517

- L513 3 mm PLUG
- L514 4 mm PLUG
- L515 5 mm PLUG
- L517 7 mm PLUG

These connectors employ the O-Z multiple contact leaf spring a well-known BELLING-LEE feature, ensuring low contact resistance and high current rating. It also combats faulty contact and ejection under vibration.

CURRENT RATINGS

- L513 10 A
- L514 10 A
- L515 15 A
- L517 40 A

TYPE No.	L513	L514	L515	L517
STEM	6 B.A.	4 B.A.	4 B.A.	2 B.A.
A	inch	0.562	0.625	0.656
	mm	14,3	15,9	16,7
B	inch	0.125	0.218	0.250
	mm	3,2	5,6	6,4
D	inch	0.234	0.281	0.281
	mm	6	7,1	7,1
S	inch	0.125	0.156	0.204
	mm	3	4	5

4 mm SINGLE POLE HIGH TENSION CONNECTOR

- L623/P FIXED PLUG
- L623/S FREE SOCKET

This plug and socket assembly employs the O-Z contact principle, a well-known BELLING-LEE feature ensuring low contact resistance and reliability when subjected to vibration.

VOLTAGE BREAKDOWN (d.c.): at sea level > 10 kV
18 000 m 60 000 ft
> 1.5 kV

INSULATION RESISTANCE: $\geq 10 \times 10^3$ megohms

CONTACT RESISTANCE: 6-13 milliohms

PANEL THICKNESS (maximum): 0.312 inch 7,9 mm

FIXING TORQUE: 90-200 ozf inch 1,41-0,63 N m

WIRE SIZE: 0.35 inch 9 mm maximum diameter

MATERIALS: Body-Phenolic resin moulding
Contacts- Plug Phosphor-bronze
Socket Brass
Finish-silver plated

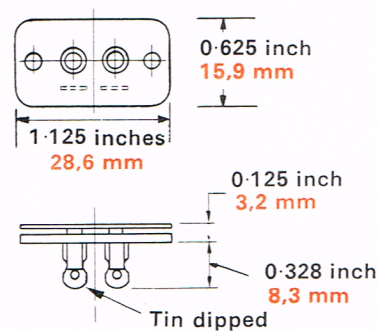
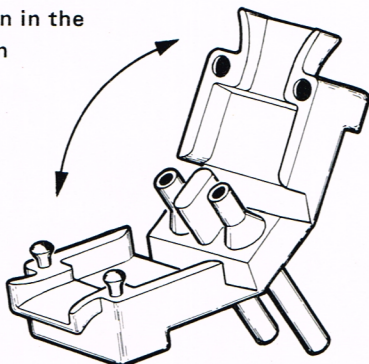
WEIGHT (average): Socket 23.84 g 0.84 oz
Plug 15.57 g 0.55 oz

L733 SERIES LOW VOLTAGE 2 POLE CONNECTORS

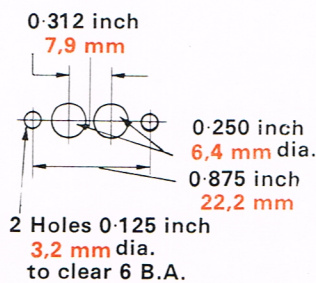
- L733/P FREE PLUG
- L733/S FIXED SOCKET
- L733/J FREE SOCKET (JACK)

Originally designed for television twin feeder connections, these small connectors are suitable for many other low voltage signal applications including extension loudspeaker circuits. The conductors may be crimped or soldered into the spills of the free members, and the 'butterfly' moulding is snap fastening, making loading quick and easy.

L733/P shown in the open position



L733/S



PANEL CUT-OUT