# Belling-Lee Technical Catalogue

# Components and Interconnection Systems Division

#### **Product information**

In compiling this catalogue we have included all the relevant product data which is likely to be required.

Our local Technical Sales Engineer will always be pleased to check the contents of your catalogue and ensure that it includes the latest information. We welcome any suggestions which would improve its usefulness.

#### Patents, registered designs and trademarks

Belling-Lee is a registered trade mark and this is applicable to all our products. In addition, we use other trade names, registered and unregistered, covering individual items or groups of similar items, e.g. FLEXIPAD. Many of our products are covered by patents and/or registered designs (or applications), too numerous to list in this catalogue.

Enquiries concerning these matters should be addressed to our Patents Department.

#### **Evaluation samples**

Engineers can request samples for evaluation and any precise information which may be of assistance.

#### Modifications and alterations

Belling-Lee reserve the right to make any modifications to the data and products shown in this catalogue.

#### Conditions of sale

All sales transactions are in accordance with our standard conditions of quotation and sale, copies of which are available on request.

Lampholders
Indicating fuseholders
Panel fuseholders
Open fuseholders
Fuseclips and fuseholder adaptors
Thermal and magnetic delays

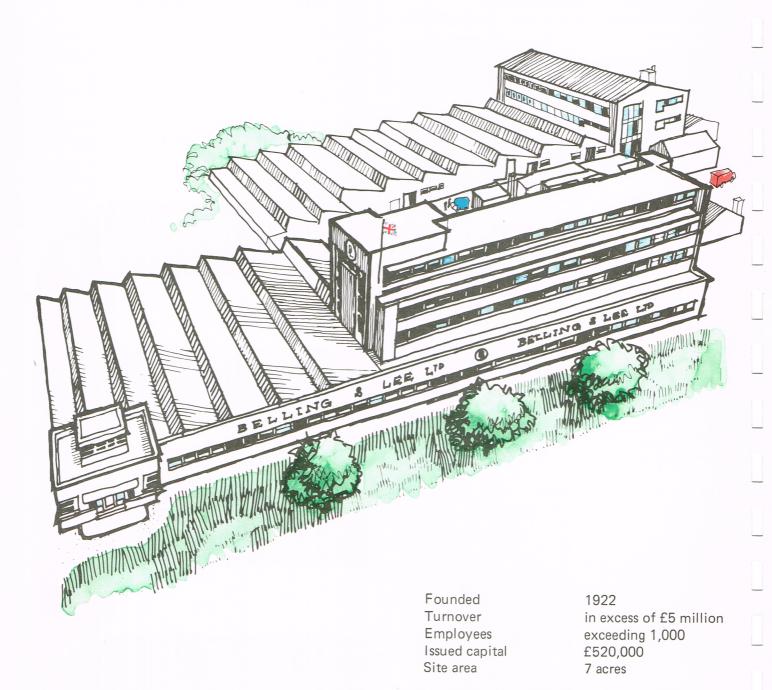
Subminiature coaxial connectors
Miniature coaxial connectors
Miniature coaxial unitors
Standard coaxial connectors
BNC connectors

Terminals Barrier terminal blocks Flexible terminal blocks Knobs

Single pole plugs and sockets
Multipole connectors
Mains connectors
Printed circuit edge connectors
Ribbon cable
Flexible circuits
Interconnection systems



# Divisions of Belling-Lee



Belling & Lee Ltd. have three main Product Divisions in addition to the Electronic Component and Interconnection Systems Division.

## Electronic Equipment Division

A comprehensive range of equipment and accessories for coaxial cable television systems used in hotels, schools, blocks of flats and whole towns up to 300,000 subscribers.

## Radio Frequency Interference Suppression Equipment Division

Modular and custom built RFI shielded enclosures up to 120 dB attenuation and a 1 Hz to 10 GHz frequency range with associated power and signal line filters. The RFI filter range includes standard list line and customised filters ranging from a few milliamperes to several hundred amperes.

The L3000 modular shielded enclosures are supplied as complete prefabricated units for installation using a minimum of tools and site labour.

## **Prestincert Limited**

Manufacture patented, self piercing inserts for mounting components swiftly, securely and accurately to piece parts, panels or chassis of steel, aluminium etc. The Prestincert technique reduces operation costs as the components are punched directly into sheet metal without the need for pre-pierced holes. Standard and customised bushes are available with unified and metric threads, each designed for a specific sheet thickness.

Catalogue information for all these products are available upon request.

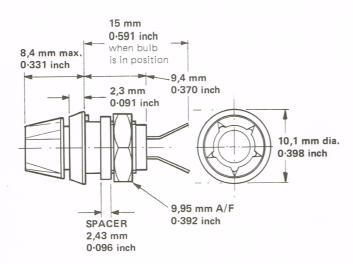


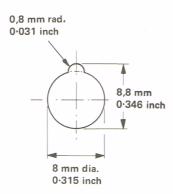
BELLING-LEE

Belling and Lee Ltd., Gt. Cambridge Road, Enfield, Middlesex, EN1 3RY. Telephone: 01-363 5393. Telex: 263265. Cables: 'Radiobel' Enfield.

## L1901 Sub-miniature lampholder







Panel cut-out

A fully insulated, panel mounting, sub-miniature lampholder of metric design for 3 mm tubular flange cap lamps. The lens is available with a choice of 5 colours (see below), and unscrews for lamp replacement. It is supplied with spacer which enables it to be used on very thin panels, if required

Lamp style:

Power rating:

Lens colours:

Panel thickness (maximum):

Fixing torque:

Temperature range:

humidity

Insulation resistance:

Voltage breakdown (to panel)

Materials:

Weight (average):

Belling-Lee reference number:

3 mm tubular (T - 1), with flange cap type S3s

 $\leq 0.75$  Watt (temperature rise < 40 °C)

Amber, blue, clear, green or red

6 mm 0.23 inch

0,4 N m 3.5 lbf inch -40 °C to + 70 °C

(Ambient)

21 days (BS 2011) (part 2, damp

heat, long term) ≥ 10<sup>3</sup> megohms

≥3 kV at 50 Hz

Mouldings polycarbonate

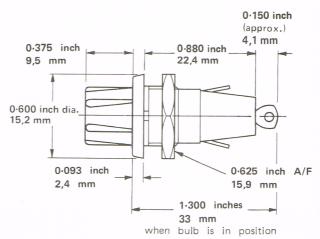
- brass, silver-plated Contacts

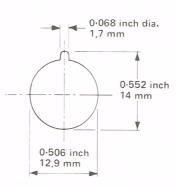
1,9 g 0.07 oz

L1901/Colour of lens

### L1896A Low voltage lampholder







Panel cut-out

This miniature indicator fitting has been designed to match the styling of fuseholders L1596B, E6011B and neon light L1897 shown elsewhere in the green section. It requires the same size panel cut-out and has a single fixing nut. A locating spigot on the underside of the rim

The bulb is easily removed from the front of the panel after unscrewing

The lens is available in a choice of 5 colours.

L1896A uses 5 mm tubular L.E.S. lamps (cap E5/8) or 6 mm tubular midget flange lamps (S6s8), covering a range of voltage ratings and filament life requirements.

Mounting rings for both lamps are included.

Power rating(lamp):

≤ 1 W/ (temperature rise  $\leq$  40  $^{\circ}$ C)

Voltage proof:

Insulation resistance:

Temperature range:

Panel thickness (maximum):

Fixing torque (maximum):

Lamp style:

Lens colours:

Materials and finish:

0,68 N m 6 lbf inch

0.141 inch 3,6 mm

>100 megohms -40 °C to +60 °C

2 kV at 50 Hz

Amber, blue, clear, green or red

Body moulding - phenolic resin - polycarbonate

(Ambient)

Lens Contacts

- silver-plated

T1½ 5 mm tubular L.E.S. (cap E5/8)

T1% 6 mm tubular midget flange

lamp (S6s8).

Weight (average): Belling-Lee reference number:

4,7 g 0·17 oz L1896A/Colour of lens

Example: L1896A/red

## L1897/240 Neon indicator light



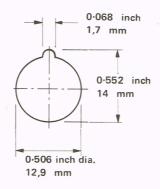
0·375 inch 9,5 mm

0·880 inch 22,4 mm

0·600 inch dia. 15,2 mm

0·625 inch A/F 2,4 mm

15,9 mm



Panel cut-out

Styled to match the L1896A miniature lampholder and L1596B and E6011B fuseholders.

Complete with neon lamp and resistor for instant connection. Attractive in appearance and economically priced.

Breakdown voltage:
Insulation resistance:
Temperature range:
Panel thickness (maximum):
Fixing torque (maximum):
Length of wires:
Materials:
Lens colours:

Voltage range:

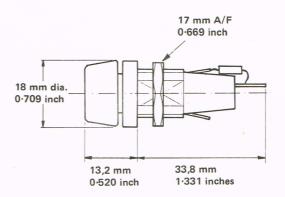
Weight (average):
Belling-Lee reference number:

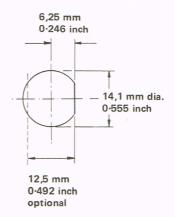
>8 kVd.c. (leads to chassis)
>100 megohms (leads to chassis)
-55 °C to +60 °C (Ambient)
0.141 inch 3,6 mm
0,68 N m 6 lbf inch
8.75 inches 222,3 mm
Body moulding — phenolic resin
Lens — polycarbonate
Amber, clear, or red.
5,2g 0.18 oz
L1897/240/colour of lens
Example: L1897/240/Red

200 V to 250 Va.c./d.c.

## L2009 Panel fuseholder, indicating







Panel cut-out

A miniature panel fuseholder for 20 x 5 mm fuse links. The fuse carrier (cap) houses a neon lamp which lights and becomes visible through a lens in the top when the fuse link has blown and the power remains on.

Available with a choice of two lens colours, clear or red.

Supplied complete with neon lamp and ballast resistor for 240 Va.c.

Current rating:
Insertion resistance:
Insulation resistance:
Voltage breakdown:
Temperature range:
Panel thickness:
Fixing torque:
Fuse carrier torque:
Terminations:

se carrier torque: 5 lbf
rminations: For so

0-110
up to

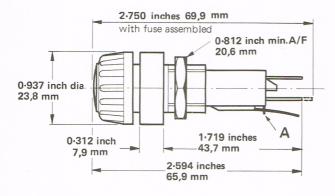
Weight (average):
Belling-Lee reference number:

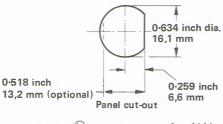
6,3 A
10 milliohms maximum
> 100 megohms (cap removed)
> 5 kVd.c. (cap removed)
- 40 °C to + 70 °C (Ambient)
7,9 mm 0-312 inch maximum
0,68 N m 6 lbf inch maximum
5 lbf in 0,56 N m maximum
For solderless snap-on connectors
0-110 x 0-024 inch 2,8 x 0,61 mm
up to 5 A, or solder (all ratings).

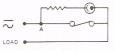
10,9 g 0.38 oz L2009/240/Clear or L2009/240/Red

#### L1848A/240 Panel fuseholder, indicating, size 0

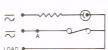












Lamp alight when fuse link intact

Designed for a 1% inches x % inch, 32 mm x 6.3 mm size 0.3AG and IEC 127 Standard Sheet IV fuse link. This panel fuseholder is supplied complete with neon lamp and ballast resistor which may be wired either so that the lamp lights when the fuse link is intact or when the fuse link has been blown.

Bayonet fitting fuse carrier; terminations equally suitable for solderless snap-on connectors 0.250 x 0.032 inch 6,3 x 0,81 mm or soldered connections.

L1848A/240 with 68 kilohms ballast resistor is suitable for  $200-260\ Va.c./d.c.\ circuits.$ 

Current rating (maximum):

10 A (15 A @ 55  $^{\circ}$ C ambient temperature)

Temperature rise: Insertion resistance: Ambient temperature range: ≤30 °C ≤10 milliohms -40 °C to +70 °C >100 megohms

removed

Insulation resistance: Voltage breakdown (a.c.):

> 2.5 kV terminations to chassis > 2.5 kV between terminations, cap

Panel thickness (maximum): Fixing torque (maximum):

0.250 inch 6,35 mm 1,36 N m 12 lbf inch 0.565 N m 5 lbf inch Body — moulded plastic

Fuse carrier torque (maximum): Materials:

lens — moulded low-loss plastic Contacts — brass, silver-plated

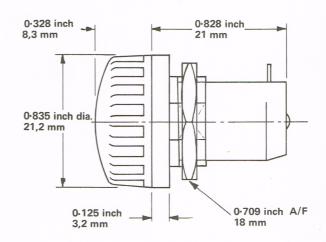
Weight (average):

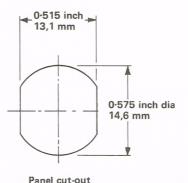
23,6 g 0.83 oz

## L675 Panel fuseholder, size 00

Barrier and panel sealed







This fuseholder was specially designed for the Services for use with heavy duty (high rupturing capacity) fuse links. It is not suitable for use with glass cartridge fuse links.

Specification:

DEF - 64

Current rating: Breakdown voltage (d.c.): 2 A (temperature rise  $\leq$  40 °C) Sea level  $\geq$  9 kV

Insulation resistance:

60 000 feet 18 000 m 1 kV > 100 megohms

Insertion resistance: Humidity: < 30 milliohms H5

Temperature range:
Panel thickness (maximum):

- 55 °C to + 70 °C (Ambient) 0·15 inch 3,8 mm 0,62 N m 5·5 lbf inch

Fixing torque (maximum): Weight (average):

0.48 oz 13,7 g

Qualification Approved

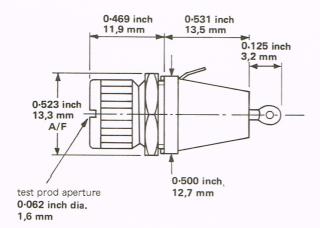
#### L575A Panel fuseholder, size 00

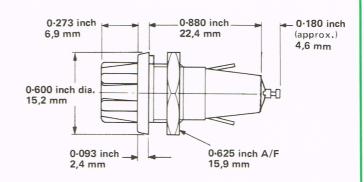
With test prod aperture in lid

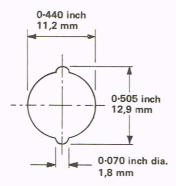
#### L1596B Panel fuseholder, Size 00



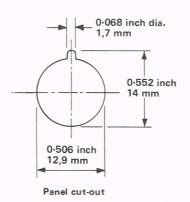








Panel cut-out



This miniature, panel mounting fuseholder was designed for the use of the Services and is recommended for all situations where space is at a premium.

Specification:

RCS 262 Issue 2

Current rating:

2.5 A (temperature rise < 55 °C)

Breakdown voltage (d.c.):

Sea level > 3.5 kV 60 000 feet 18 000 m > 1 kV

Insulation resistance:

>100 megohms

Insertion resistance: Humidity:

<5 milliohms

Temperature range: Panel thickness (maximum): Class H2 - 40 °C to +70 °C (Ambient)

Fixing torque (maximum): Weight (average):

0.064 inch 1,6 mm 0,32 N m 2.8 lbf inch 0.19 oz 5,3 g

Qualification Approved

A robust, miniature, panel mounting fuseholder of contemporary styling. The fuse link is withdrawn on removal of the screw cap, which has a 'knock-out' for insertion of a test probe, if required.

Current rating:

7 A (temperature rise  $\leq$  40 °C).

Breakdown voltage (d.c):

Sea level ≥ 4 kV 60 000 feet 18 000 m 1 kV

Insulation resistance:

>100 megohms

Insertion resistance:

< 10 milliohms

Temperature range:

-55 °C to + 70 °C (Ambient)

Panel thickness (maximum):

9/64 inch 3,6 mm

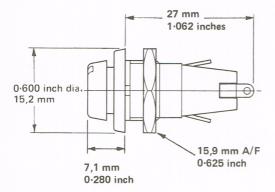
Fixing torque (maximum): Weight (average):

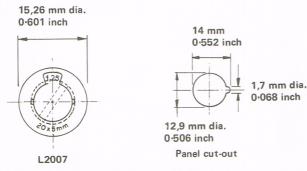
0,68 N m 6 lbf inch 0.17 oz 4,8 g

## L2006A Panel fuseholder L2007 Dial-a-rating kit (optional)

for 20 x 5 mm fuse link







This fully finger-proofed panel mounting fuseholder is designed to meet the safety requirements of IEC 257, DEMKO, NEMKO and SEMKO, and BS 415.

L2007, Dial-a-rating accessory kit enables the value of the fitted fuse like to be readily indicated.

Mounting on the panel is effected through a single hole and secured by a nut. A locating spigot on the underside of the rim prevents rotation.

#### Current rating:

Test voltage:

Insertion resistance: Breakdown voltage (d.c.): Insulation resistance: Temperature range: Panel thickness:

Recommended fixing torque: Conductor size (maximum):

Weight (average): Belling-Lee reference number: Fuseholder:

Dial-a-rating kit:

Dial-a-rating kit:

6,3 A (temperature rise < 65 °C on accessible parts). 4 k V d.c. 50 cycles 1 minute

5 milliohms av., 10 milliohms max. > 4 kV

≥ 100 megohms - 55 °C to + 70 °C (Ambient) 0,91 to 3,58 mm 0.036 - 0.141 inch

0,68 N m 6 lbf in 1,2 mm diameter, 24/0,2 mm or 18 s.w.g.

1 2006

4,7 g 0·17 oz

L2007/A for fuse ratings 1, 1,25, 1,6, 2, 2,5, 3,15, 4, 5, 6,3 A

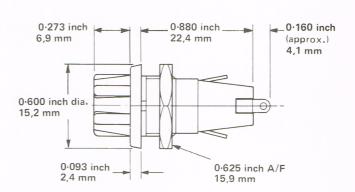
L2007/B for fuse ratings

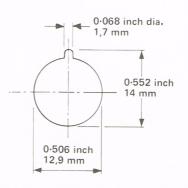
0,032, 0,04, 0,05, 0,063, 0,08, 0,1, 0,125, 0,16, 0,2, 0,25, 0,315, 0,4, 0,5,0,63,0,8 A

#### E6011B Panel fuseholder

for 20 x 5 mm fuse link







Panel cut-out

Current rating: Voltage rating: Breakdown voltage (d.c.):

Insulation resistance: Insertion resistance:

Temperature range: Panel thickness (maximum): Fixing torque (maximum): Weight (average):

6.3 A 250 Va.c. Sea level ≥4 kV 60 000 feet 18 000 m 1 kV

>100 megohms < 10 milliohms
-55 °C to + 70 °C (Ambient)</pre>

9/64 inch 3,6 mm 0,68 N m 6 lbf inch 0.17 oz 4,8 g

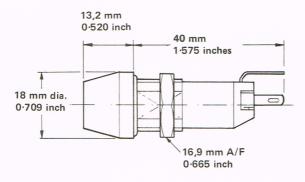
## L1742 Panel fuseholder, barrier and panel sealed,

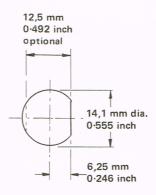
for 20 x 5 mm fuse link

#### L1742/U Panel fuseholder, unsealed

for 20 x 5 mm fuse link







#### Panel cut-out

These panel mounting fuseholders for 20  $\times$  5 mm fuse links are designed to meet the safety requirements of IEC 257, DEMKO, NEMKO, and SEMKO. A coin slot in the fuseholder head facilitates easy

Mounting on the panel is effected through a single hole, shaped to engage the anti-swivel flats on the fuseholder body, which is secured with a nut.

The connector posts are suitable for soldering or for solderless snap-on connectors.

6,3 A

Current rating: Insertion resistance (maximum): 10 milliohms Breakdown voltage (d.c.):

>3 kV

Insulation resistance: Temperature range: Sealing:

 $\geq$  100 megohms -55 °C to +70 °C (Ambient) Leakage less than 1 cc/h @ 15 lbf/inch<sup>2</sup> 100 kPa

Panel thickness (maximum): Contacts:

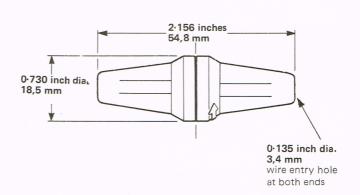
0.315 inch 8 mm Nickel-plated brass

Terminations: Weight (average): 0.110 x 0.024 inch 2,8 x 0,61 mm

15,5 g 0.55 oz

## L1745 In-line fuseholder, size 0







Simply and economically wired into a supply line, the L1745 accommodates a 1% inches x % inch 32 mm x 6.3 mm fuse link. The circuit is broken when the fuseholder is opened by a simple push-and twist operation.

Colour:

Current rating:

Insertion resistance (maximum): 15 milliohms Insulation resistance (minimum): 100 megohms

(BS 415):

Temperature range: Connections:

Maximum wire size:

Weight (average): Belling-Lee reference number: Black

7 A (temperature rise  $\leq$  25 °C)

Maximum safe working voltage 34 V peak

-25  $^{\circ}$ C to +60  $^{\circ}$ C (Ambient)

70/0.0076 inch 30/0,25 mm, overall

diameter 0·125 inch 3,18 mm

5,18 g 0·18 oz L1745/Black

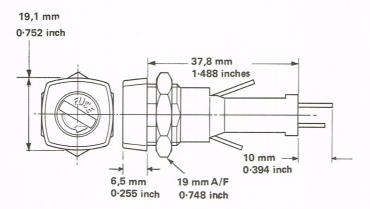
## L2004 Panel fuseholder, size 0

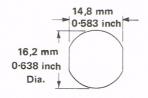
(Adaptor available for 20 x 5 mm fuse links)

## L2003 Coloured bezel for above

(L2004 Supplied complete with black bezel)







Panel cut-out

### The L2004 is a fully fingerproof safety fuseholder designed to comply with the requirements of Publications IEC 257, and BS 415. The fuseholder is supplied with a black removable bezel, which snaps into place over the front flange. Other bezels in green, grey, red and white can be purchased in packs of 50, quoting quantity required and

Belling-Lee reference number L2003/Colour. Adaptor: Order L1940A for use with 20 x 5 mm fuse links.

15 A (temperature rise ≤ 40 °C above ambient)

10 A (when tested in accordance with

IEC 257)

30 A (BS AU 105)

≥4 k Vd.c.

≥ 100 megohms

≤5 milliohms

Insertion resistance: Temperature range:

Breakdown voltage:

Insulation resistance:

-25 °C to +85 °C (Ambient)

Humidity:

21 days (BS 2011 - IEC 68-1)

Panel thickness:

4 mm maximum

Fixing torque:

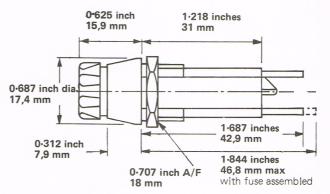
10.6 lbf inch 1,2 Nm Weight (average): 9,7 g 0.342 oz

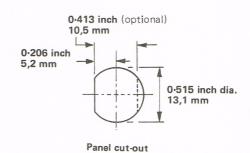
Terminations:

Will accept two sizes of solderless snap-on connectors 0.250 x 0.032 inch 6,3 x 0,81 mm and 0.187 x 0.032 inch 4,75 x 0,81 mm, or

## L1744A Panel fuseholder, bayonet locking, size 0







A panel mounting fuseholder for a 11/4 inches x 1/4 inch, 32 mm x 6,3 mm fuse link, fitting a 0.515 inch diameter panel cut-out. It has a bayonet locking cap, and connection posts suitable for soldering or for 0.250 inch x 0.032 inch 6,3 mm x 0,81 mm solderless snap-on connectors. A special internal insulation barrier is incorporated to provide superior breakdown voltage performance.

Current rating:

Breakdown voltage (a.c.):

Insulation resistance:

Insertion resistance:

Humidity:

Temperature range:

Panel thickness (maximum):

Fixing torque (maximum):

Mouldings: Contacts:

Weight (average):

10 A (temperature rise ≤ 40 °C

above ambient)

20 A (BS AU 105)

>4 kV between terminations

> 10 kV terminations to panel

> 100 megohms

< 15 milliohms

21 days (BS 2011 - IEC 68-1)

- 55 °C to +70 °C (Ambient)

0.313 inch 7,9 mm

1,18 N m 10 lbf inch Phenolic resin

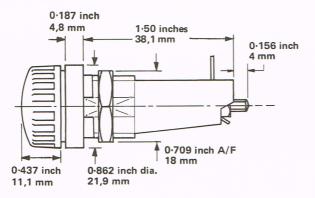
Brass, silver-plated

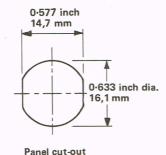
13,7 g 0.48 oz

#### L1382 Panel fuseholder, size 0

Barrier and panel sealed







Originally developed for use with heavy duty size 0 fuse links, the design has now been modified to accommodate glass cartridge fuse links as well. The L1382/H variant has a test prod aperture 0.094 inch 2,4 mm diamter in the head.

Another variant, L1382/LIVE, has received qualification approval by the Post Office. It is marked with the Post Office reference number P.O.136F and the end terminal is marked LIVE.

Specification:

7 A (temperature rise  $\leq$  40 °C) Current rating:

(15 A at 55 °C maximum)

Breakdown voltage (d.c.):

>10 kV > 100 megohms

Insulation resistance: Insertion resistance: Humidity:

< 15 milliohms

Temperature range:

H5 (DEF - 5011) - 55 °C to +70 °C (Ambient)

Panel thickness (maximum):

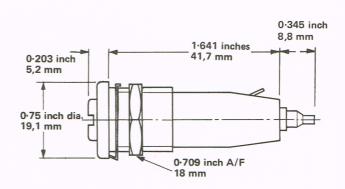
0.156 inch 4 mm 1,7 N m 15 lbf inch 0.84 oz 23,4 g

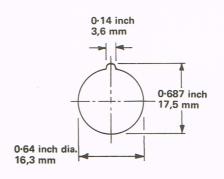
Fixing torque: Weight (average):

Qualification Approved

#### L1348A Panel fuseholder, size 0







Panel cut-out

This standard size 0 panel fuseholder, used throughout the instrument industry, is also extensively used by H.M. Services and the Post Office.

Current rating:

7 A (temperature rise  $\leq$  40 °C) 15 A at 55 °C maximum ambient

temperature

Breakdown voltage (d.c.):

>9 kV

Insulation resistance:

> 100 megohms

Insertion resistance: Humidity:

<5 milliohms H2 (RCS 11) -40 °C to +100 °C (Ambient)

Temperature range: Panel thickness (maximum):

0.4 inch 10 mm 0,57 N m 5 lbf inch 0.7 oz 197, g

Fixing torque: Weight (average):

## L1045/C3 Single fusebox, size 0

With end and rear wire entries

## L1033/C4 Double fusebox, size 0

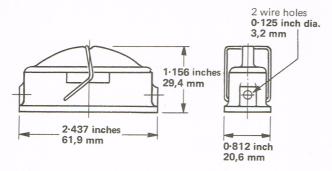
With end and rear wire entries A two-pole version of L1045/C3

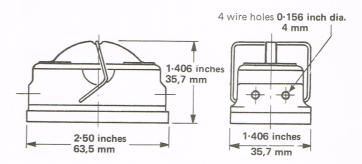
Scale 1:2

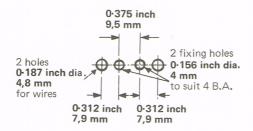
Scale 1:2











Panel cut-out

2 fixing holes
0-156 inch dia.
4 mm
to suit 4 B.A.

0-531 inch
13,5 mm

4 holes for wires
0-250 inch dia.
6,4 mm

0-484 inch
12,3 mm

Panel cut-out

Designed for chassis mounting. A standard 1% inches x % inch 32 mm x 6,3 mm fuse link is held in the lid and automatically exposed and isolated from the circuit as the lid is raised. Leads may be inserted through the base or through the ends of the box.

Current rating:

Breakdown voltage (d.c.): Temperature range:

Temperature range: Weight (average):

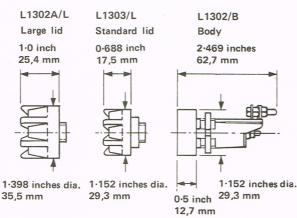
10 A (temperature rise  $\leq$  40 °C) to chassis  $\geq$  4 kV -40 °C to +85 °C (Ambient) 22,1 g 0.78 oz

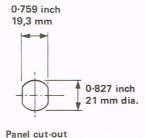
Current rating: Breakdown voltage (d.c.):

Temperature range: Weight (average):

10 A (temperature rise  $\leq$  40 °C) Between poles  $\geq$  8 kV Poles to chassis  $\geq$  4 kV -40 °C to +85 °C (Ambient) 47 g 1.68 oz Heavy duty panel fuseholders, barrier and panel sealed L1302/B Body L1302A/L large lid L1303/L standard lid







These panel mounting fuseholders for size 1 fuse links, were developed for use in military, sea and land vehicles. They also have many industrial

The fuseholders have different lids, either the standard or large, the latter providing a finger guard and increased creepage path for additional safety under wet conditions, thus permitting a higher working voltage

Fuse link withdrawal occurs automatically as the lid is unscrewed.

Mounting on the panel is effected through a single hole, shaped to engage the anti-swivel flats on the fuseholder body, which is secured

The terminals are supplied complete with washer and shakeproof nuts.

Current rating: Maximum working volts (Services' rating): Insulation resistance: Insertion resistance: Temperature range: Sealing:

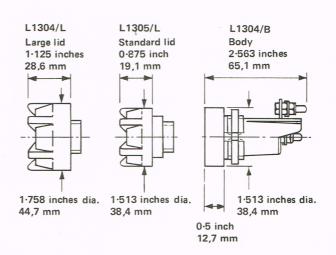
Panel thickness (maximum): Weight (average):

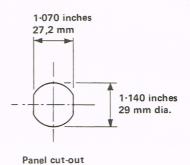
15 A (temperature rise  $\leq$  40 °C) L1302/B - L1302A/L 620 V peak L1302/B - L1303/L 250 V peak > 100 megohms <5 milliohms -40 °C to + 100 °C (Ambient) Leakage less than 1 cc/h at 15 lbf/inch<sup>2</sup> 100 kPa 0.204 inch 5,2 mm 2.47 oz 70 g with large lid

Sealing: with standard lid 2.0 oz 57 g

Heavy duty panel fuseholder, barrier and panel sealed L1304/B Body L1304/L large lid L1305/L standard lid







These two fuseholders are similar to the size 1 fuseholders, but are designed to accommodate the larger size 2 fuse links.

Current rating: Maximum working volts (Services' rating): Insulation resistance: Insertion resistance: Temperature range:

Panel thickness (maximum): Weight (average):

A (temperature rise  $\leq$  40  $^{\circ}$ C) L1304/B - L1304/L 620 V peak L1304/B - L1305/L 250 V peak > 100 megohms <5 milliohms -40 °C to + 100 °C (Ambient) Leakage less than 1 cc/h at 15 lbf/ inch<sup>2</sup> 100 kPa 0.204 inch 5,2 mm 125 g 4.4 07 with large lid

4.2 oz

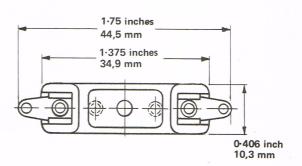
with standard lid

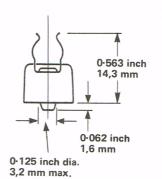
## L1383 Open fuseholder, size 00 L1426 Open fuseholder, 20 x 5 mm

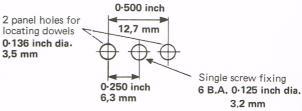
Single pole, for printed circuits of 0.1 inch module

#### L510 Open fuseholder, size 0 Single pole

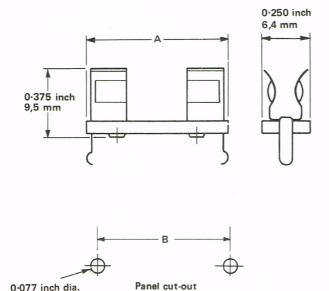








Panel cut-out



Dimension L1383		L1426
А	0.735 inch 18,7 mm	0.937 inch 23,8 mm
В	0.700 inch 17,8 mm	0.900 inch 22,9 mm

Mounted by means of its terminals, the fuseholder may be connected and secured in position in a single soldering operation.

Current rating: Breakdown voltage (d.c.): Insulation resistance:

Insertion resistance: **Humidity:** 

2 mm

Ambient temperature

Panel thickness (maximum):

Materials:

Weights (average):

2 A (temperature rise  $\leq$  40 °C) Sea level > 3 kV30 x 10<sup>3</sup> megohms <4 milliohms Dry conditions only

90 °€

0.063 inch 1,6 mm Insulant - S.R.B.P.

Contacts - beryllium-copper, silverplated.

0,9 g L1383 0.03 oz 0.036 oz

This chassis mounting, single fuseholder is fixed by means of a central screw, and has dowels to prevent rotation.

Current rating: > 8 kV > 10<sup>3</sup> megohms Breakdown voltage (d.c.): Insulation resistance: Insertion resistance: Humidity: Temperature range:

Materials:

H2 (RCS 11) -40 °C to + 70 °C (Ambient) Moulding - phenolic resin Contacts - phosphor-bronze, silver-

< 10 milliohms

7 A (temperature rise  $\leq$  40 °C)

plated Weight (average): 0·13 oz 3,71 g

#### L2005 Open fuseholder, 20 x 5 mm

Twelve-way

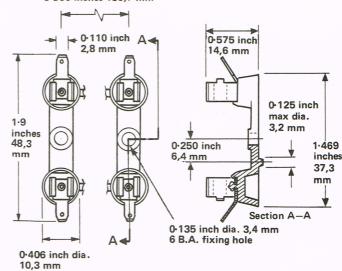


## L1746 Open fuseholder Size 0

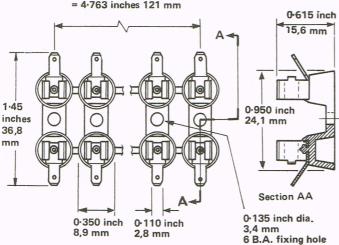
Twelve-way



#### 12 units at 0.500 inch 12,7 mm centres = 5.500 inches 139,7 mm



#### 12 units at 0.433 inch 11 mm centres = 4.763 inches 121 mm



#### A European version of L1746

Current rating:

Insertion resistance (maximum): 5 milliohms per pole Breakdown voltage:

Terminations:

Materials:

Mounting:

Weight (average):

2 A at 85  $^{\circ}\text{C}$  maximum ambient 6·3 A at 60  $^{\circ}\text{C}$  maximum ambient 5 kV minimum at 50 Hz

Suitable for solderless snap-on connectors 0.110 inch x 0.012 inch 2,8 mm  $\times$  0,3 mm up to 5 A or soldered (wire to be wrapped first) for > 5 A

Insulant - nylon

Contacts - phosphor-bronze silver-plated

12 holes 6 B.A. clearance at 1 per fuseway

16,3 g 0.57 oz

Although normally supplied as a 12-way assembly, this is easily divisible into smaller units as required.

Current rating:

Terminations:

Breakdown voltage:

5 A at 75  $^{\circ}\text{C}$  maximum ambient 7.5 A at 50  $^{\circ}\text{C}$  maximum ambient Insertion resistance (maximum): 5 milliohms per pole

6 kV minimum at 50 Hz

Insulation resistance (minimum): 100 megohms
Temperature range: -55 °C to +100 °C (Ambient)

Suitable for solderless snap-on connectors 0.110 inch x 0.012 inch 2,8 mm x 0,3 mm up to 5 A or soldered (wire to be wrapped first)

for > 5 A. Insulant - nvion

Contacts — phosphor-bronze,

silver-plated

Mounting:

Materials:

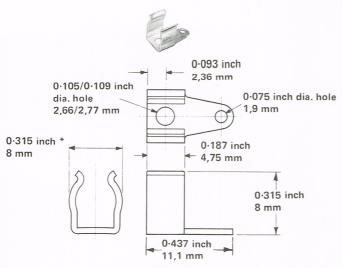
12 holes 6 B.A. clearance at 1 per fuseway with dowels removed. When mounted singly an additional hole 0.129 inch 3,3 mm diameter is required for dowel.

20,7g 0.73 oz

Weight (average):

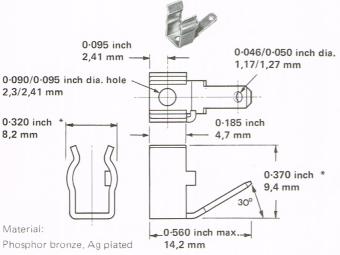
#### PP499 Fuseclip

for 1/4 inch nominal dia. (6,35 mm) fuse link



Y14219 Fuseclip

for ¼ inch nominal dia. (6,35 mm) fuse link



\* with maximum fuse link inserted

PP499 is the fuse clip used in fuseholder type L510 shown on page 11 Y14219 is used in L1746 described on a separate page. Both clips can be supplied loose for mounting on customers' own panels.

These fuse clips are made of phosphor-bronze, which is superior to brass for this purpose, and are silver-plated for low contact resistance. Contact pressure can be increased, if desired, by gently squeezing the two wings closer together. The current rating is determined by the temperature attained by the contacts, which, amongst other things, is dependent upon the type of fuse link and the conductors used, and should not exceed 110 °C.

PP499 is intended for soldered connections, but Y14219 may also be used with  $0.110 \times 0.012$  inch  $(2.8 \times 0.3 \text{ mm})$  push-on connectors at currents up to 5 A, and incorporates a retaining ear controlling axial displacement of the fuse link.



Recommended mounting hole dimensions

	Nominal length of fuse link		Dimension A		
inch	mm	inch	mm		
5/8	16	0.438	11,1		
3/4	19	0.563	14,3		
7/8	22	0.688	17,5		
1	25	0.813	20,7		
1.1/16	27	0.876	22,3		
1.1/4	32	1.063	27		

## L1940A Adaptor

For 20 x 5 mm fuse link





This adaptor permits the use of 20  $\times$  5 mm fuse links, in panel fuseholders designed for size 0 fuse links (1½ inches  $\times$  ½ inch diameter 32 mm  $\times$  6,3 mm).

Current rating:

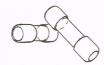
6,3 A

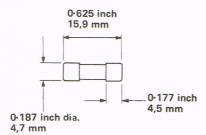
Weight (average):

Brass, nickel-plated 3,43 g 0.12 oz

## Miniature glass fuse links, size 00

5/8 inch x 3/16 inch diameter 15,9 mm x 4,7 mm





This range of miniature fuse links was developed originally for Services' use, but has many applications in instrumentation, electronic data processing machines, printed circuitry, and all miniaturised equipment.

The higher ratings (250 mA and over) blow within 10 seconds at twice their rated current 2 In, lower ratings at 3 In.

De-rating factor for operation at elevated temperatures: 1.75 % per 10 °C up to 100 °C.

Breaking capacity:

Life:

Marking:

See table

≥ 1 000 hours continuous at rated

current at 25 °C.

Rated value on cap

Weight (average):

0,61 g 0.02 oz

Belling-Lee reference number:

L562/current rating in amperes Example: L562/.050 is a 50 mA

fuse link.

Fuseholders which will accept this type of fuse link, are shown elsewhere in the green section.

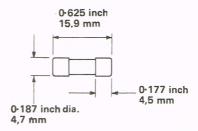
Continuous rating 1 000 h	Rated d.c. +	
50 mA	900 V	250 V
100 mA	900 V	250 V
150 mA	600 V	250 V
250 mA	600 V	250 V
350 mA	300 V	250 V
500 mA	300 V	250 V
1 A	200 V	250 V .
2.5 A	150 V	150 V
4 A	60 V	60 V
5 A	60 V	60 V
7 A	60 V	60 V

+ based on maximum breaking cap. of 10 In.

‡ based on maximum breaking cap. of 10 In or 35 A whichever is greater

L754 Miniature, ceramic fuse links, size 00 5/8 inch x 3/16 inch diameter 15,9 mm x 4,7 mm





High rupturing capacity fuse links with a range from 50 mA to 2 A and a category of duty 250 V AC2, 230 V DC2 (maximum prospective overload 4 000 A at 0.4 pf and 250 Va.c., or 230 Vd.c. time constant  $\geq 0.004$ ).

#### Minimum life:

1 000 hours continuous at rated current at temperatures up to 35  $^{\circ}$ C 1 000 hours continuous at 80 % of rated current at temperatures beyond 35  $^{\circ}\mathrm{C}$  up to 85  $^{\circ}\mathrm{C}$  .

-60 °C to +85 °C (Ambient) Temperature range:

#### Minifuses:

The L754 range of fuse links has been extended downwards for instrument protection and other light duty applications by the addition of 10, 15 and 25 mA ratings.

Specification:

DEF - 63 - A

Humidity classification:

DEF - 133

Marking:

Body marked with rating.

Weight (average):

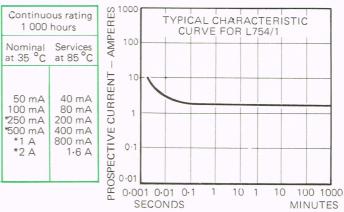
0,85 g 0.03 oz

Belling-Lee reference number:

L754/current rating in amperes Example: L754/·050 is a 50 mA

fuse link

Fuseholders which will accept this type of fuse link, are shown elsewhere in the green section.

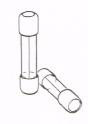


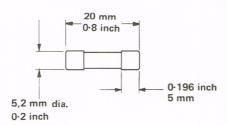
\*Qualification approved

**BLOWING TIME** 

## L1427A International, glass fuse links

Size 20 x 5 mm diameter





A range of quick acting, cartridge fuse links for use at a maximum ambient temperature of 35 °C, a maximum relative humidity of 75 % and a minimum air pressure of 860 mbar.

Designed to comply with BS 4265, CEE 4 and IEC 127 (ratings above 2 A are not included in BS 4265).

Breaking capacity:

35 A a.c. or  $10 \times In$  (whichever is

greater).

Voltage rating:

250 Va.c. 35 °C

Ambient temperature (max.): Marking:

Symbol F, current and voltage rating on cap, in accordance with BS 4265.

0,79 g 0.028 oz

Weight: Belling-Lee reference number:

L1427A/current rating in amperes

Example: L1427A/050 is a 50 mA fuse link.

Fuseholders which will accept this type of fuse link, are shown elsewhere in the green section.

Current ratings:

50 mA 100 mA 160 mA 250 mA 500 mA 630 mA 800 mA 1,25 1,6 2 2,5 Δ 3,15 А 4

А

5

6,3 Α

## L2080/L2081 Time lag glass fuse links

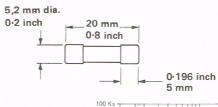
size 20 x 5 mm diameter





L2080

L2081

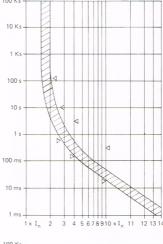


#### L2080

#### Time-Current Zone

D limits from standard-sheet

Belling-Lee values



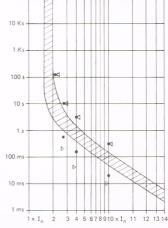
## L2081

#### Time-Current Zone

limits from standard-sheet 100 mA

limits from standard-sheet 160, 250 mA

Belling-Lee values



Fuseholders which will accept this type of fuse link, are shown elsewhere in the green section.

A range of light duty time lag fuse links with better than normal anti-surge properties, for the protection of telecommunications and electrical equipment where the prospective fault current of the circuit does not exceed 35 A.

The blowing characteristics (pre-arcing times) are designed to meet the requirements of IEC 127, standard sheet III.

Current ratings: L2080 L2081

Rated voltage:

Breaking capacity:

Weight (average):

Marking:

500 mA 800 mA 1 A 1,6 A 2 A 100 mA, 160 mA, 250 mA.

250 V a.c.

35 A 35 °C

1 g 0.035 oz  $Symbol\ 'T', Current\ and\ voltage\ ratings$ 

Belling-Lee reference number:

Ambient temperature (max.):

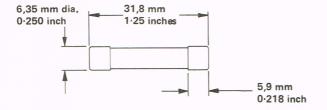
List number/current rating L2081/100 is a 100 mA time-lag

fuse link.

### L2238 Time lag glass fuse links, size 0

11/4 inches x 1/4 inch diameter 32 mm x 6,3 mm





These light duty, time lag fuse links have many applications in the protection of electrical, telecommunications and entertainment equipment, where the action is slow enough to avoid blowing on harmless transient overloads. These fuse links will withstand current surges of 10 times their nominal rating lasting for up to 10 milli-seconds, which would rupture a quick acting fuse.

Current ratings:

250 mA, 500 mA, 800 mA, 1 A, 1,6 A, 2 A.

Rated voltage:

250 Va.c.

Breaking capacity:

Temperature rating:

Marking:

35 A 35 °C maximum (Ambient) Symbol 'T', current and voltage rating

on cap

2,01 g 0.07 oz Weight(average) Belling-Lee reference number:

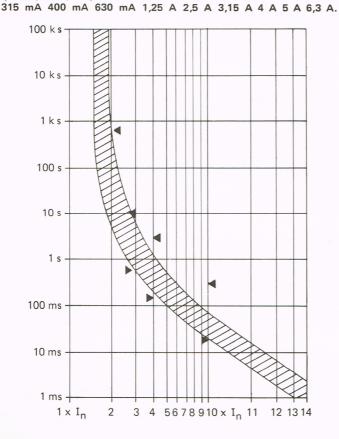
List No. /Current rating

L2238/250 is a 250 mA time lag

fuse link.

Fuseholders which will accept this type of fuse link, are shown elsewhere in the green section.

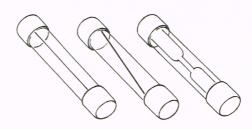
The following ratings are also available to special order, (minimum quantity is 10,000 pieces):



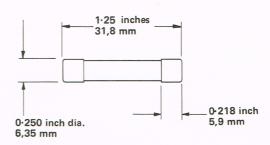
#### **Time-current Characteristics**

## L1055 Standard glass fuse links, size 0

11/4 inches x 1/4 inch diameter 32 mm x 6,3 mm



(Alternative forms of construction)



These fuse links have a minimum life of 1 000 hours continuous rated current at 25  $^{\circ}\mathrm{C}$  and blow within 10 seconds at 2 In. De-rating factor for operation at elevated temperatures: 1.75 % per 10  $^{\circ}\text{C}$  up to 100  $^{\circ}\text{C}$  .

"For the protection of telecommunication and light electrical equipment where the prospective fault current of the circuit will not exceed 10 times the rated current of the fuse link".

Markings:

Rated value on cap.

Weight (average):

1,98 g 0.07 oz

Belling-Lee reference number:

L1055/current rating in amperes Example: L1055/.060 is a 60 mA

fuse link.

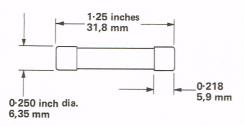
Fuseholders which will accept this type of fuse link, are shown elsewhere in the green section.

Continuous	Rated	Continuous	Rated
rating 1 000 h	voltage	rating 1 000 h	voltage
60 mA	1000d.c 250a.c	3 A	60 d.c 150 a.c
100 mA	1000d.c 250a.c	5 A	60 d.c 60 a.c
150 mA	1000d.c 250a.c	7 <b>.</b> 5 A	60 d.c 60 a.c
250 mA	750d.c 250a.c	10 A	60 d.c 60 a.c
500 mA	300d.c 250a.c	12 A	32 d.c 60 a.c
750 mA	300d.c 250a.c	15 A	32 d.c 32 a.c
1 A	250d;c 250a.c	20 A	32 d.c 32 a.c
1.5 A	200d.c 250a.c	<sup>25</sup> A	32 d.c 32 a.c
2 A	150d.c 250a.c		

#### L693 Standard, ceramic, filled fuse links, size 0

11/4 inches x 1/4 inch diameter 32 mm x 6,3 mm

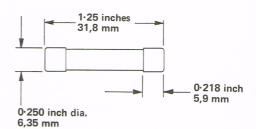




#### L760 Standard, ceramic, unfilled fuse links, size 0

1¼ inches x ¼ inch diameter 32 mm x 6,3 mm





These fuse links have a category of duty 440 V AC4, 230 V DC4 (maximum prospective overload 33 000 A at 0.3 pf and 440 Va.c., or 230 Vd.c. time constant  $\geq 0.015$ ).

1 000 hours continuous at rated current at temperatures up to 35 °C 1 000 hours continuous at 80 % of rated current at temperatures beyond 35 °C up to 85 °C.

-60 °C to +85 °C (Ambient) Temperature range:

Approved by Joint Services, Central Electricity Board, and Lloyd's Register of Shipping.

Specification:

DEF - 63 - A

Humidity classification:

DEF - 133

Marking:

Body marked with rating and Joint Services' catalogue number.

Weight (average):

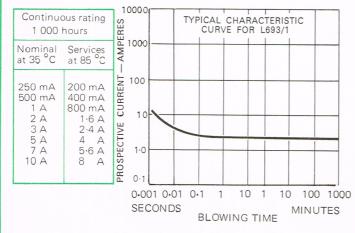
2,6 g 0.09 oz

Belling-Lee reference number:

L693/current rating in amperes Example: L693/.250 is a 250 mA

fuse link.

Fuseholders which will accept this type of fuse link, are shown elsewhere in the green section.



These fuse links extend the range of heavy duty links down to 60 mA. Category of duty, 250 V AC2, 230 V DC2 (maximum prospective overload 4 000 A at 0.4 pf and 250 Va.c., or 230 Vd.c., time constant ≥0.004).

#### Minimum life:

1 000 hours continuous at rated current at temperatures up to 35  $^{\circ}$ C 1 000 hours continuous at 80 % of rated current at temperatures beyond 35 °C up to 85 °C.

Specification:

DEF - 63 - A

Current ratings:

60 mA, 100 mA, 150 mA

Temperature range:

-60 °C to +85 °C (Ambient)

Body marked with rating and

Marking:

Joint Services' Catalogue number.

Weight (average):

2,2 g 0.08 oz

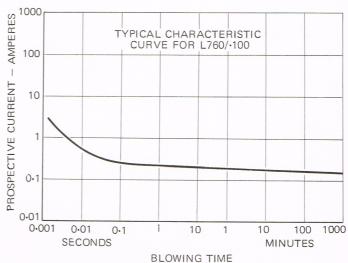
Belling-Lee reference number:

L760/current rating in amperes

Example: L760/·060 is a 60 mA

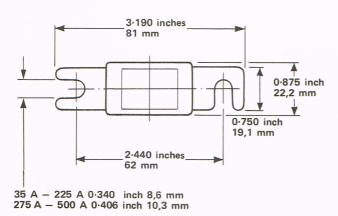
fuse link.

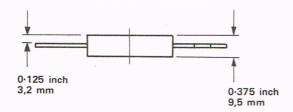
Fuseholders which will accept this type of fuse link, are shown elsewhere in the green section.



#### L1330A Low voltage, heavy duty fuse







These robust, self-contained (needing no holder) fuses afford short circuit protection for the supply and overload protection for welding equipment and heavy current rectifier units, and the motors of battery driven vehicles, hoists and winches. Housed in a strong ceramic case, with a shatter-proof window for visual inspection of the fuse element; this is integral with the solid terminal lugs by which the fuse may be mounted directly in the supply line. These terminal lugs are slotted to facilitate quick release for replacement.

Nominal current ratings:

35 A, 50 A, 80 A, 100 A, 130 A, 150 A, 200 A, 225 A, 275 A, 325 A,

500 A. 48 V.

Voltage rating:

Maximum perspective overload:

3 000 A, time constant (d.c.)

0.005/0.006

The fuses have a minimum life of 1 000 hours continuous at rated current at a temperature of 25 °C or at 80 % of their nominal rated current at 70 °C, and blow within 10 seconds at three times their rated current.

Temperature range:

Weights (average):

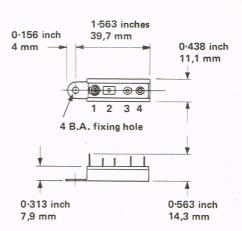
-65 °C to + 70 °C. (Ambient) 18,7g to 29,8g according to rating. Current rating printed on window and stamped on lug.

Belling-Lee reference number:

L1330A/current rating Example: L1330A/150 is a 150 A

#### L422/IC/L Miniature delay switch Auto resettina





Terminals 1 & 3 contacts Terminals 2 & 4 heater

A general purpose indirectly heated delay switch for controlling circuits of low power. The contacts are normally closed, opening within 10-45 seconds.

Switching capacity: Endurance:

1 A at 25 Va.c. maximum 250,000 operations at 25 Va.c.

Heater rating:

1.5 watts 6 V

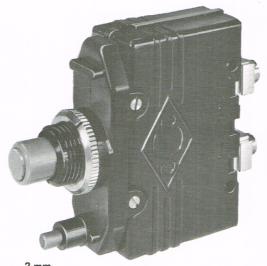
Weight (average):

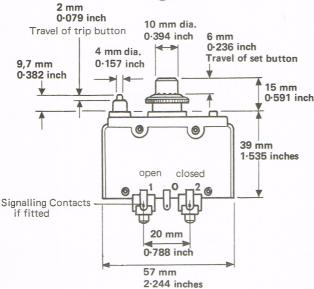
0.37 oz 10.5 g

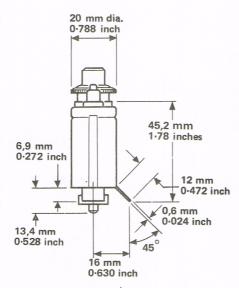
#### Note:

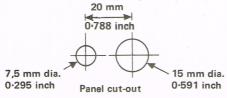
If the heater is connected in series with the switch contacts, the current will flow through the bi-metal element and may affect the timing.

# Securex miniature circuit breakers and cut-outs L5100 series, thermally operated L5200 series, thermal-magnetic

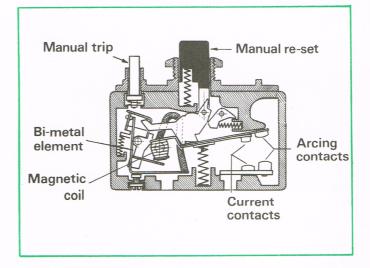








Maximum panel thickness 4 mm 0.160 inch



These robust, precision devices combine the functions of circuit protection, switching and indication in a single compact unit. They operate thermally on moderate over-current but, in the L5200 series, with large fault currents (above 6 to 10 times the rated current) a magnetic coil takes charge, tripping the mechanism virtually instantaneously, i.e., in a matter of milli-seconds.

Like a fuse, the speed of operation on overload therefore varies inversely as the magnitude of the over-current, but the circuit breaker has the advantage of being able to withstand harmless surges without tripping. Having no fusing element, embrittlement is not a hazard and the characteristics remain constant throughout the long life of the device.

A further advantage is the ability to restore a circuit rapidly after faults have been cleared. However, the action is "trip-free" which means that a circuit cannot be held closed by the "reset" button while faulty conditions exist.

Preferred current ratings (i.e. maximum load current values) extend from 300 mA to 20 A, as detailed opposite.

The maximum breaking capacity is 500 amp at 275 volts a.c. and 0.8 power factor for ratings of 5 amp and over, and 300 amp for ratings below 5 amp. Secondary contacts are fitted for breaking the arc under these conditions, so that the main circuit contacts are not eroded. With L5100 series, in circuits where large, continuous fault currents (>10 ln) can occur, the very sensitive ratings below 2 A should be protected by means of an appropriate external fuse.

#### Alternative facilities

The "trip" button can be omitted, so that the device becomes a protective cut-out. The "reset" button has a length of travel of nearly ¼ inch so that it projects well beyond the central boss when the mechanism has tripped, providing a clear indication of the circuit condition. However, an additional set of change-over contacts can be included for remote signalling if required.

#### Mounting

The recommended standard types are panel mounted by means of a central threaded boss. However, they can be converted for plug-in mounting in switch boxes, by using 4 mm plug pins in place of the two terminal screws.

#### Selection of ratings

As with most thermally operated devices, unless specially compensated, ambient temperature variations will affect the performance and, when selecting a rating, it is prudent to allow for this in order to avoid false operation.

The specified rating of these miniature circuit breakers is determined at a nominal ambient temperature of 20 °C. At lower temperatures the rating may be increased and vice versa, and the normal value should be multiplied by a correction factor which may be obtained from the graph opposite.

Example: L5201/5

The rating at  $20^{\circ}C$  is 5A

At 0 °C the correction factor is 1.05 the rating is 1.05 x 5 = 5.25 A

At 40  $^{\circ}$ C the correction factor is 0.92 the rating is 0.92 x 5 = 4.6 A

Preferred current ratings (In):	0,3 0,5 0,7 1 2 3 5 8 10 and 15 A The circuit breakers will hold in indefinitely on all currents up to 1 • 1 times the rated value			
Breaking capacity (maximum):	300 A for ratings up to 3 A 500 A for ratings of 5 A and over factor			
Tripping times:	At 1.5 x In ≤5 min *At 10 x Ina.c. ≤ 10 ms At 2 x In ≤60 s *At 15 x Ind.c. ≤ 10 ms At 5.5 x In ≤7 s *Magnetic			
Breakdown voltage (d.c.):	>4 kV between terminals >6 kV between linked terminals and metal panel			
Working voltage (max.):	275 Va.c. (r.m.s.) 60 Vd.c.			
Insulation resistance:	>10 <sup>3</sup> megohms			
Insertion resistance (typical):	Rating         Nominal         Tol.           0,3 A         9·2 ohm         ± 16 %           0,5 A         3·3 ohm         ± 16 %           0,7 A         1·8 ohm         ± 16 %           1 A         0·9 ohm         ± 16 %           2 A         0·12 ohm         ± 16 %           3 A         80 milliohm         ± 16 %           5 A         50 milliohm         ± 16 %           8 A         26 milliohm         ± 16 %           10 A         18·5 milliohm         ± 25 %           15 A         10 milliohm         ± 30 %			
Temperature range:	- 55 °C to + 70 °C (Ambient)			
Humidity:	H5 (DEF - 5011)			
Altitude:	D1 satisfactory to 9 000 m 30 000 ft (DEF - 5011)			
Acceleration:	A1 satisfactory to over 35 g (DEF - 5011)			
Signalling contacts (if fitted):	Single pole change-over Maximum rating 1 A at 250 V a.c. or 50 Vd.c. substantially non-inductive			
Maximum wire size:	7/0,85 mm 7/0-029 inch			
Maximum panel thickness:	4 mm 0·160 inch 8 s.w.g.			
Weight (average):	According to type, 1.9 oz 54 g minimum 2.3 oz 65 g maximum			

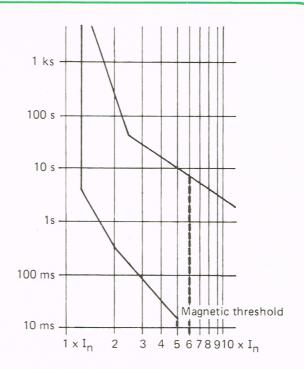
It may be possible to cater for ratings not shown above with minimum quantities of each type.

The ratings in question: 0,1 0,2 0,4 1,5 2,5 3,5 4,6 12 and 20 amp.

#### Belling-Lee reference numbers

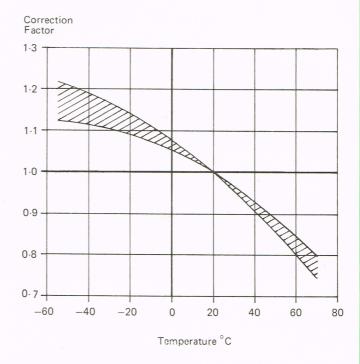
Types a	available:		
List number		Description	
Thermal L5100/In L5101/In L5110/In L5111/In	Thermal-mag. L5200/In L5201/In L5210/In L5211/In	Cut-out (i.e. no trip button) Circuit breaker (i.e. with trip button) Cut-out with signalling contacts Circuit breaker with signalling contacts	

Example: L5211/5 is a circuit breaker for controlling a circuit in which the normal current is up to 5 A at 20  $^{\circ}$ C; fitted with signalling contacts.



Ambient Temperature 20 °C

#### **Time-Current Characteristics**



Limits of the Influence of Temperature