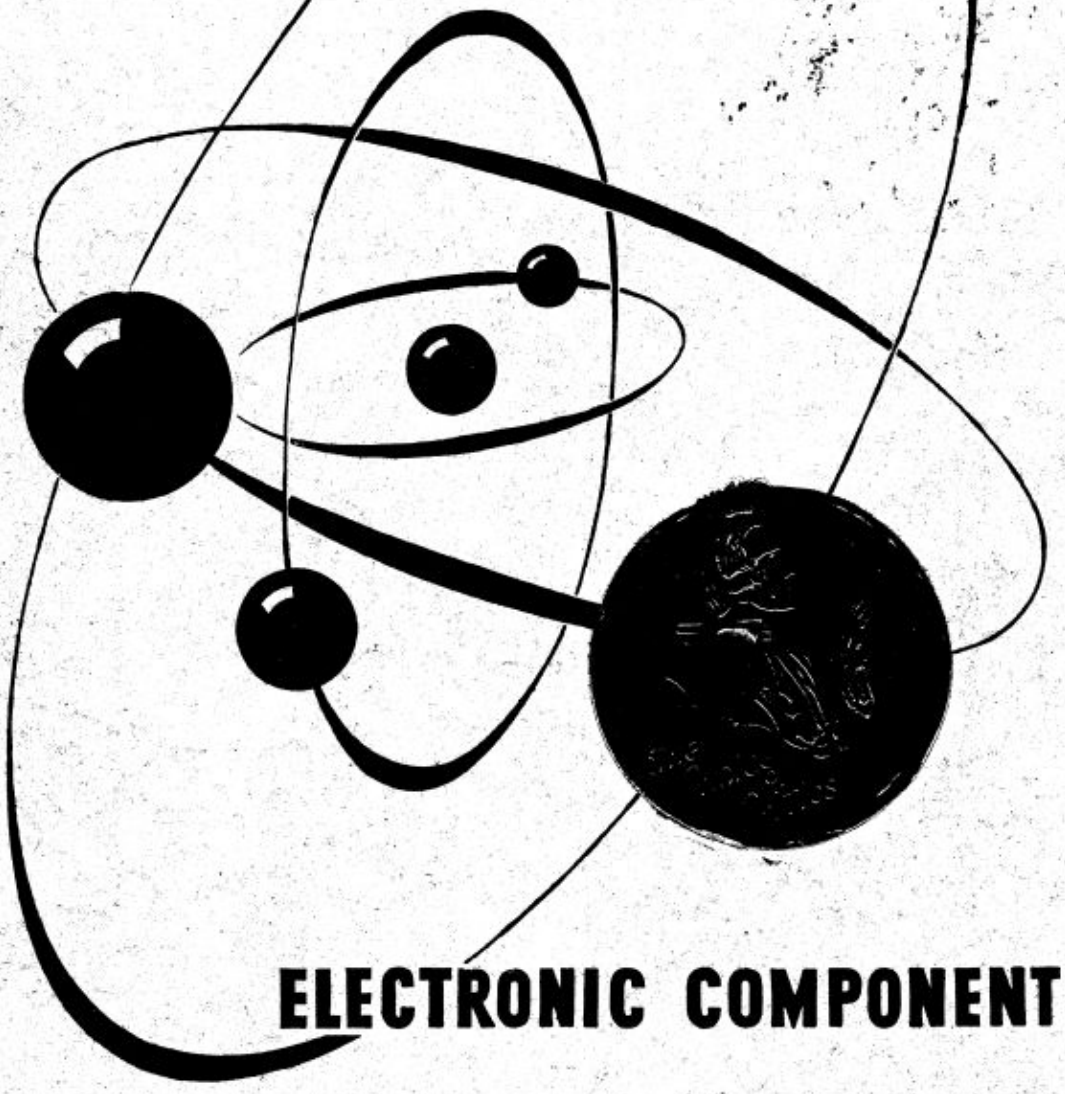
BULGIN
CATALOGUE



ELECTRONIC COMPONENTS

TERMS AND CONDITIONS

Terms Credit Accounts may be opened if desired by business houses upon furnishing us with two satisfactory written trade references.

Remittances must in all cases accompany orders from customers not having Credit Accounts, otherwise a Pro Forma Invoice will be sent. All cheques, postal orders, etc., should be made payable to A. F. Bulgin & Co. Ltd., and crossed. Bank Notes should always be enclosed in registered envelopes.

We have a special department to deal with orders per C.O.D. system if desired.

Ordering When placing your orders, kindly state list number and name of article required; do not cut out illustrations from the catalogue, as this destroys its utility for future ordering.

Guarantee All goods are thoroughly tested before leaving the factory, and are guaranteed to be electrically and mechanically sound. Should any defect develop within a reasonable time from the date of purchase, the article will be repaired or replaced free of charge, providing it has not been misused or damaged, and it is returned to us carriage paid with the guarantee slip to be found in the packing of the article.

Designs & Prices We reserve the right to change the design, withdraw or alter prices and/or specifications of any articles in catalogues without notice or liability. Improvement in design from time to time may slightly alter the present illustration and/or description. Every care is taken to ensure that data and dimensions are correct as shown, but we accept no liability in respect of contingencies arising from errors. Where dimensions are critical, check with us for latest data; installation drawings upon request.

Custom Built Components Apart from the large range of general components in this catalogue, we manufacture an enormous range of Special Components in bulk for individual users. Such items are not catalogued, but many could be available to further users. Such items are sold under BULGIN numbers with the prefix 'Q', a letter which is not used in our List Number series.

Accordingly, if a user requires an item which is not catalogued, or a variant of a catalogued item, we can often meet the need where bulk quantity is envisaged. A fully descriptive inquiry should be given to us, also stating the quantity.

Technical Consulting Service You are invited to consult with our Technical Experts for information and advice on any new electrical or electronic component. Write to us and you will receive a prompt, authoritative and friendly reply. Our greatest satisfaction comes from giving you personal service and attention.

All your orders and letters are assured of being handled by people who show a friendly interest in your needs.

Continuity of Supply Customers are assured that in general, all components which we have been manufacturing for the last 25 years, and all items which are now shown in this catalogue, will be available for replacement for many years to come.

All tools are stored and maintained, even if a component is not listed, and are always available if at any time in the future replacements are required on a reasonable quantity basis.

LIST No. 198

"The Choice of Critics"

(Registered Trade Mark)

The

BULGIN

CATALOGUE

(Copyright)

OF

RADIO, RADAR, TELEVISION, TELECOMMUNICATION, ELECTRONIC AND ELECTRICAL COMPONENTS

PRICE 1/- POST FREE

A. F. BULGIN & CO. LTD.
Bye-Pass Road
Barking - - Essex

Telephone : RIPpleway 5588 (8 lines)
(Private Branch Exchange)
Cablegrams and Telegrams : BULGIN RIPPLEWAY 5588

MEMBERS of THE RADIO AND ELECTRONIC COMPONENT MANUFACTURERS' FEDERATION ; A.I.D., AND A.R.B. APPROVED.

EXPERIMENTAL RADIO TRANSMITTER G9ABY.

Suppliers of Radio and Electronic Components to the ADMIRALTY ; WAR OFFICE ; AIR MINISTRY ; MINISTRY OF SUPPLY ; MINISTRY OF CIVIL AVIATION ; MINISTRY OF WORKS ; HOME OFFICE ; N.P.L. ; RESEARCH ESTABLISHMENTS ; G.P.O. ; B.B.C., etc., and to THE LEADING AIRCRAFT, AUTOMOBILE, ELECTRICAL APPLIANCE, INSTRUMENT AND RADIO MANUFACTURERS.

A. F. BULGIN, M.B.E., M.Brit.I.R.E.
Sen.M.I.R.E.
Chairman and Managing Director

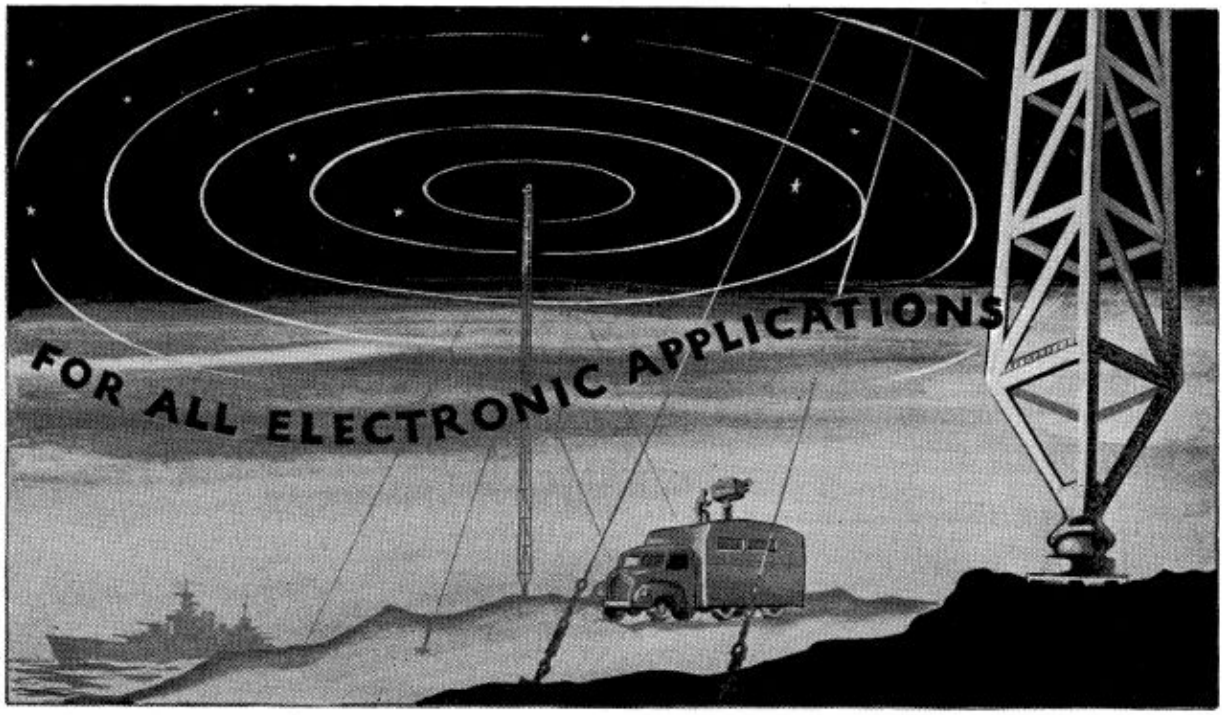
FOR over a quarter of a century the HOUSE OF BULGIN has been designing and building radio and electrical components of the highest technical standard and quality, and, with the passing years, the name of BULGIN has figured prominently in every new development in the fields of radar, radio, telecommunications, instruments and all branches of electronics. Today, this wealth of experience is incorporated in our wide range of products, a selection of which is listed in this catalogue.

All BULGIN Products can be supplied in "Tropical" versions, and/or to specifications such as DEF/5000, 6000/56, etc. Many are manufactured in services-approved versions.

Nos. of Bulgin Patents and Regd. Designs

273490	462420	784908	756088	382870
294765	468477	750293	742925	459628
367266	534294	811053	784909	460507
421548	535398	753747	801343	811054
457667	531615	744264	802090	480744
472748	862205	11218/50	849346	845907
	867472	867473		
	AND MANY PENDING			

A. F. BULGIN & Co., Ltd. **BULGIN** **BARKING, ESSEX**

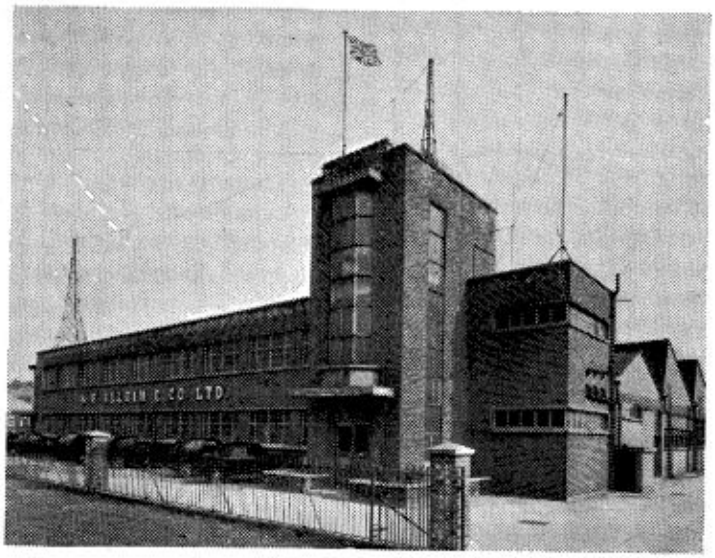


RENOWNED for their superlative quality and reliability BULGIN products are obtainable from all reputable stockists of radio and electrical components, in all parts of the world.

Inquiries from overseas are particularly invited, in view of the fact that special treatment and finishes (ensuring satisfactory performance in most climates) are applied to versions of our products, where requested. Approval for various uses overseas has been gained, and our Products are used world-wide.

In case of difficulty in obtaining supplies of BULGIN products, please communicate with us direct.

BULGIN RADIO COMPONENTS ARE OBTAINABLE EVERYWHERE



THE BULGIN FACTORY is completely self-contained, employing the latest types of machinery and apparatus, and is particularly well equipped for the manufacture of high-grade components for the electrical and radio industry.

The Tool-Room, Moulding Shop, Press Shop and Assembly Shops, staffed with highly-skilled personnel and using the latest processes known to science, are vital links in the BULGIN production chain.

To maintain our rigid quality standards, comprehensive arrangements are provided for routine and type-testing. Scientifically devised methods of inspection and test, using accurate test gear, are applied at every production stage to ensure adequate quality control. Routine type-testing is applied to all products, random-taken from production batches, and automatic life-test equipment ensures maintenance of users-quality under full working conditions. Specially designed equipment, which often we make for ourselves, cover special manufacturing and testing processes, to ensure—now, as always—that

BULGIN PRODUCTS

are

"THE CHOICE OF CRITICS"

A SHORT HISTORY

1923

THE original firm of A. F. Bulgin & Co. Ltd. was founded in a very modest way by the present Chairman and Managing Director, Mr. A. F. Bulgin, M.B.E., M.Brit.I.R.E., Sen.M.I.R.E., in April of the above year, to specialise in the manufacture of radio components of the highest quality.

The policy associated with our registered trade marks "BULGIN" and "The Choice of Critics" was constantly maintained, and as the years advanced the reputation and range of BULGIN products made remarkable progress. Increasing demand was met by plans for an enlarged and modern style of factory, and this was achieved just prior to the war.

1939–45

DURING the above period, under difficulties of no mean order, the whole of the energies of the "House of Bulgin" was concentrated on production for the Government services. Developments of components of high priority were satisfactorily completed and manufactured in grades and finishes to meet the extreme conditions found in all parts of the world, and the exacting detail and experience thus gained is still embodied in all BULGIN products. Over TEN MILLION COMPONENTS were manufactured during this period.

1957

WITH the former years as a background, to-day our policy, watchwords, and ideals are still unchanged, and we are proud to say that we now produce the largest and most varied range of electronic components in the world, made by any one company. Every year sees new developments, fresh ideas, and new methods of production keeping pace at all times with the latest practice.

Although pioneers in the manufacture of components, our aim is still further to widen our field and cater for the newest requirements of our many thousands of satisfied customers in every country.

SYMBOLS AND ABBREVIATIONS USED IN THIS CATALOGUE AND IN OUR PUBLICATIONS

We make the fullest use of the "shorthand" of mathematics and telecommunications, and conform to all relevant British Standards where applicable. The following abbreviations, multipliers, etc., are of interest.

$\pm$ = plus/minus
$\varnothing$ = diameter
Ω = Ohm(s)
H = Henry(ies)
V = Volt(s)
A = Ampere(s)
W = Watt(s)
VA = Volt-ampere(s)
F = Farad(s); Fahrenheit
K = Kilo- (= $\times$ 1000)
M = Meg. (= $\times$ 10^6)
m = milli- (= $\times$ 10^{-3})
μ = micro- (= $\times$ 10^{-6})
p = pico- (= $\times$ 10^{-12})
$>$ = greater than . . .
$<$ = less than . . .
$\not>$ = *not* greater than . . .
$\not<$ = *not* less than . . .
$\neq$ = not equal to . . .
$\approx$ = approx. equal to . . .
Peak = 1·414 $\times$ R.M.S. for true sine waveform

$=$ = d.c., direct current
$\simeq$ = a.c., and d.c.
λ = wavelength
$\sim$ = (also) cycles-per-Sec.
f,$\sim$ = frequency(cycles/sec.)
p.d. = potential difference
c/s = cycles/second
% = per hundred
B.S. = British Standard
R.M.S. = root-mean-square, = 0·707 $\times$ peak for sine waveform
a.c. = alternating current
d.c. = direct current
s/c = short circuit
o/c = open-circuit
m = (*alone*) metre(s)
h = height
$\square$ = square
W/C = wavechange
S.P. = single-pole

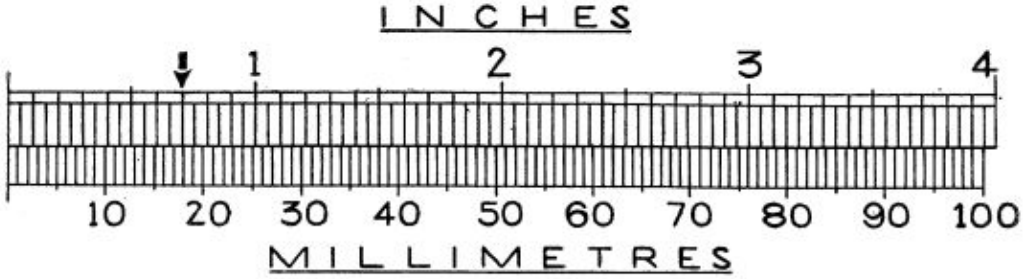
D.P. = double-pole
T.P. = triple-pole
C.O. = change-over
M.B. = make-break(= on-off)
π = *pi* ; 3·14159 . . .
$\omega = 2\pi f$; radian(s)
° = Degrees
Q = goodness factor, $\omega L/r$
C = Centigrade ; Capacitance,-ive
I = Current
R = Resistance
E = Potential (*i.e.*, Voltage)
Z = Impedance
X = Reactance
L = Inductance
ρ = Specific resistance
$\|$ = Parallel
$\angle$ = Angle
n^2 = *n* squared
$\sqrt{n}$ = Square-root of *n*.

CATALOGUE DIMENSIONS

AS far as possible, all dimensions given in this Catalogue are adhered to rigidly, but improvements in design may necessitate alterations. Where dimensions are critical and important, users should verify for up-to-date measurements.

To usual practice, fractional dimensions have tolerance $\pm \frac{1}{64}''$, and decimal dimensions, $\pm$ 0·005". Ceramics may vary $\pm \frac{1}{32}''$ or 8%, needing slots, not holes, in some chassis, brackets, or other component-fixing (e.g., Valveholders). Our own drawings are usually to 1st angle (British) projection.

To assist export users, we give below an equivalents scale of INCHES/MILLIMETRES. This will avoid calculations of: 25·4 mm. = 1 inch, etc. But the scale is NOT a RULER ; it is comparative, not necessarily full size. The arrow shows "0·7" " and how this (follow the line down to bottom scale) converts to "18 mm." Similarly, $\frac{7}{8}''$ (7 ÷ 8) = 0·875", converts to (slightly over) "22 mm."



INDEX OF LIST-NUMBERS *(Continued)*

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

THE FAMOUS GENUINE BULGIN CROCODILE CLIPS

THESE are undoubtedly the most useful accessories ever designed. Millions have been sold and continue in active use. Strong, with sharp teeth and grip. The ampere-ratings are based upon cable-screw size and continuous carrying capacity for negligible temperature rise. Special brass and/or non-magnetic and/or chromium plated (for saline use) models made to quantity orders. Note the wide range of models : fine-wire grip, tag-grip, standard-type. Normally with steel springs. Special non-magnetic &/or specially-finished (e.g., chromed against saline contamination) types can be supplied to *quantity orders* at appropriate prices.

TAG-GRIP & PIN-GRIP CROCODILE CLIPS, up to 5 Amp.

Steel, highly nickel-plated	Brass, bright self-finish	Applications
List No. C.R.30	**List No. C.R.31**	Grip wires up to 16 s.w.g., or tags up to $\frac{3}{16}$" wide, up to 18 s.w.g. thick

FINE-WIRE & FLEX-GRIP CROCODILE CLIPS, up to 5 Amp., according to cable gripped. List Nos. :

Brass, bright self finish	Steel, highly nickel-plated
C.R.20	**C.R.22**

STANDARD CROCODILE CLIPS, up to 5 Amp. List Nos. :

Steel, highly nickel-plated, with insulant handle-sleeves	
RED	BLACK
C.R.7	**C.R.8**

STANDARD CROCODILE CLIPS, up to 5 Amp. : List Nos. :

Steel, copper-plated	Steel, highly nickel-plated	Steel, lead-plated	Brass, bright self finish
C.R.4	**C.R.5**	**C.R.6**	**C.R.9**

All above have self-tapping-Screws, except C.R.9, 20, 30, 31, which have 6 B.A. Screws.

See over for rubber-cover for C.R.4–9 types. Heavy-duty Crocodile-Clips are also listed overleaf.

CROCODILE CLIPS

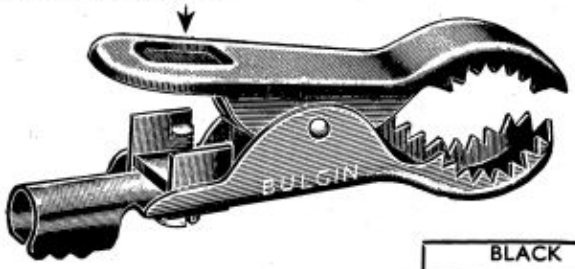
Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

HEAVY-DUTY TYPES

These heavy-duty Crocodile-clips are designed for use on battery-lugs, bus-bars, and all heavy-duty uses. Strongly constructed in lead or cadmium-plated Steel with sharp teeth and strong steel spring to ensure firm and reliable grip. Fitted with 4 B.A. screws and integral cable-grip for cable termination.

The colour code disc is a useful feature.

Note Colour Code Disc

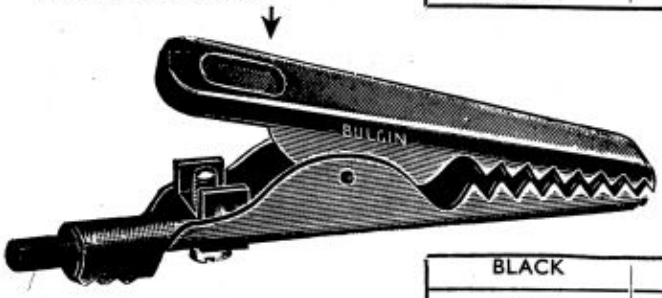


CAR BATTERY LUG-GRIP CROCODILE CLIPS, up to 25 Amps.

Made in steel, heavily lead-plated, for all battery lugs, rods, bus-bars, etc. With special screw-terminal clamp-grip, and colour code disc. List Nos., according to colour code disc :

BLACK	RED	WHITE	*None*
C.R.25	**C.R.26**	**C.R.27**	**C.R.28**

Note Colour Code Disc



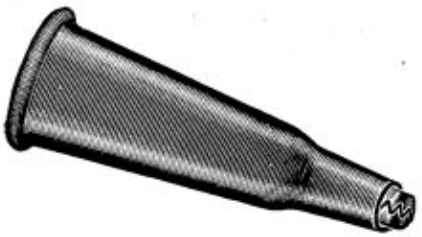
HEAVY-DUTY CROCODILE CLIPS, up to 25 Amp.

Made in steel, heavily cadmium-plated, with special screw-terminal clamp-grip, and colour code disc. List Nos., according to colour code disc :

BLACK	RED	WHITE	*None*
C.R.15	**C.R.16**	**C.R.17**	**C.R.18**

(All illustrations are approx. full-size)

RUBBER COVER FOR C.R.4-9 TYPE CLIPS



THIS new accessory for BULGIN crocodile clips gives complete insulating coverage for List Numbers C.R.4–9 type clips. *See page 7.* Moulded from high-quality Black or Red rubber, it has a highly elastic mouth which does not impede, but even aids, the full grip of the clip. Ideal for use where adjacent components are likely to be 'live', or when accidentally dropped against 'live' wires, components, etc., will not short. When ordering state List No. of clip required, suffixed with " **R** " (for **R**ubber) plus Red or Black cover, e.g., C.R.4/R/BLACK.

List No.	Material of Clip	Suffix Red or Black	Full List No.
C.R.4/R	Copper-plated steel	RED	C.R.4/R/RED
		BLACK	C.R.4/R/BLACK
C.R.5/R	Nickel-plated steel	RED	C.R.5/R/RED
		BLACK	C.R.5/R/BLACK
C.R.6/R	Lead-plated steel	RED	C.R.6/R/RED
		BLACK	C.R.6/R/BLACK
C.R.9/R	Bright-self-finish brass	RED	C.R.9/R/RED
		BLACK	C.R.9/R/BLACK

AND ACCESSORIES (See page 127 for switch accessories)

THE range of BULGIN S.W. Chokes meets all requirements, electrically and physically; all are wound to very close limits for low-priced quantity produced articles, with finest H.C. *Cu.*-instrument-wire, and are of high finish. The air-core items *may* be used in resonant circuits based upon their L.-value.

List Nos. S.W. 68, 69, 144, 146

List No.	Induc-tance*	Type, etc.			Approx. pF.	Max. D.C. mA.	D.C. Ω
		Screened	Iron Cored	Self-sup'g. in wiring			
S.W.144	30·0mH	No	No	Yes	1·0	50	350
S.W.146	0·1mH	No	No	Yes	0·5	160	9
S.W.68	2·0mH	No	No	Yes	0·5	160	40
S.W.69	15·0mH	No	No	Yes	0·8	50	250

FLEXIBLE SHAFT COUPLERS FOR ¼"Ø SHAFTS

List Nos. E.H. 15, 16

THESE useful shaft couplers permit of up to 5° axial deviation per flexible disc. For '¼"Ø ' (0·247"–0·249"Ø) shafts, with steel 4 B.A. grub screws and nickel-plated metal parts. Free from back-lash.

List Nos. of Flexible Shaft Couplers	
All metal, Single-disc	Insulated, Single-disc
E.H.15	E.H.16

PADDER PRE-SET CAPACITORS

List Nos. C.P. 2-7

THE BULGIN range covers these special Air fixed Capacitors and Mica-Padders or ' pre-sets.' With low-loss bases, and max. cap. within ± 20% of rating. Wherever *better* capacitors are required, these are used, for reliability and goodness.
Size ⅜" × 1 $\frac{5}{16}$", × ½" max. height. Min. Cap. ⩾ 40% of max. 300V. max. working.

List No.	Max. Cap. (± 20%)
C.P.2	175 pF.
C.P.3	300 pF.
C.P.4	600 pF.
C.P.5	1,000 pF.
C.P.6	2,000 pF.
C.P.7	3,000 pF.

MAGIC-EYE ESCUTCHEONS

List Nos. E.7, 8

THIS escutcheon is designed specifically for use with magic-eyes. Manufactured from brass, plated either Chrome (**List No. E.7**) or florentine bronze (**List No. E.8**). Overall diameter is 1·687" with ⅛"Ø fixing holes at 1·437" crs., with central clearing-hole 1 $\frac{7}{32}$"Ø. The diameter of the window hole is 1" and the overall depth is ·203"–·218".

List No.	FINISH
E.7	Chrome
E.8	Florentine Bronze

AIRCRAFT, SPECIAL, and AUTOMOBILE TYPES OF FUSE LINKS

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

AUTOMOBILE CARTRIDGE FUSES (FUSE-LINKS)

THESE new ranges of ¼"Ø Cartridge Fuses cover the popular values used in automobile installations to-day, and are reliable and accurate, backed by the experience of a quarter of a century of leadership. They are precise to rating and constitute an inexpensive safeguard against fire risks, run-down batteries, etc. Clearly legended with *blowing-rating*, and firmly fitted with plated caps. Element visible through strong glass body. For all usual automobile voltages.

List Nos. F.222, etc.

List Nos. F.202, etc.

Standard British and U.S.A. 1¼" Automobile type fuses with pointed end caps, ¼"Ø

1" LENGTH AUTOMOBILE FUSES

(Coded with BLOWING Rating)

List No. 1" length	List No. 1¼" length	RATED AMPS., BLOWING	Max. Carrying Amps., 1,000-hr. rating
F.222	F.202	3	1·5
F.223	F.203	5	2·5
F.224	—	8	4·0
F.225	F.204	10	5·0
F.227	F.206	15	7·5
F.229	F.208	25	12·5
—	F.210	35	17·5
Tv clear circuit within 10 secs. *at blowing-current* @ 6–25 *V.*			

List Nos.: F.270–279; Illustration is approx. exact size; 5 mm. Ø × 20 mm. long.

NEW 5 mm.Ø × 20 mm. long FUSES

THESE new Fuses, in a variety of carrying-ratings (blowing at 2 × rating, ± 25%, within 10 secs.) are to a popular continental size. May be used at up to 250 V. in Mains circuits of ≮ 1 Ω, i.e., at 250 max.A.-prospective. Clips and holders available upon special application. With Ag-plated end-caps, glass-bodies; marked with rating.

List No.	Carrying Amps.
F.270	0.06 A.
F.271	0.10 A.
F.272	0.15 A.
F.273	0.25 A.
F.274	0.50 A.

List No.	Carrying Amps.
F.275	0.75 A.
F.276	1.0 A.
F.277	1.5 A.
F.278	2.0 A.
F.279	3.0 A.

'S'- TYPE AIRCRAFT FUSES

NEW Fuses of 1/8"Ø × 1" long, with coded glass bodies, visible elements, and Ag.-plated end caps, for aircraft and like uses, in appropriate and scheduled values. Apart from aircraft, these Cartridge Fuses have many uses, and are reliable and accurate to their coded carrying-rating, based upon 1,000 hours. Blowing is within 10 secs. at + 50–100% overload. Special Unit Clips, for holding these Fuses, can be supplied to order, and they can be put to many sub-circuit uses in a wide variety of equipments.

List Nos. F.190, 191

List No.	RATING, Carrying	Approx. Blowing	Max. o/c Voltage
F.190	5 A.	10 A.	Aircraft Rating 60 V.
F.191	10 A.	20 A.	

10 mm.Ø × 38 mm. CARTRIDGE FUSES

A NEW and useful range of Cartridge Fuses with a wide range of uses. With strong glass bodies (visible elements) and Ag.-plated end caps. Coded with 1,000-hr. carrying-rating ; blowing at 100 and 150% overload as tabled. Unit clips can be supplied to order. Complete holder, List No. F.257 (*similar to* F.157, p. 15) see p. 129.

List No.	RATING Carrying (1,000-hr.)	Approx. Blowing (10 sec. max.)	Max. o/c Voltage
F.240	0·47 A.	0·95 A.	500
F.241	0·68 A.	1·22 A.	500
F.242	1·00 A.	2·0 A.	450
F.243	1·5 A.	3·0 A.	400
F.244	2·2 A.	4·4 A.	350
F.245	3·3 A.	6·6 A.	300
F.246	4·7 A.	9·5 A.	250
F.247	6·8 A.	12·2 A.	200
F.248	10 A.	20·0 A.	175
F.249	15 A.	37·0 A.	150
F.250	22 A.	55·0 A.	100
F.251	33 A.	82·0 A.	75

List Nos. F.240, etc.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders

BULGIN GLASS-ENCLOSED CARTRIDGE FUSES

ALL BULGIN CARTRIDGE FUSES are safe, certain and fireproof. They constitute reliable safeguards against damage to apparatus by overload, are simple and easy to replace, of low-Ω, and are inexpensive. They are uniform and accurate, with highly silver-plated contact caps. ALL ratings are of the CARRYING (≮1,000 hour) CURRENT. At 200 V., and over, these are sub-circuit Fuses. Choose size to be used by magnitude of danger-current rather than by normal circuit current. Note the clear, distinctive labels, printed with carrying-current rating and colour code.

Bulgin Cartridge Fuses
⅝" × ¼"Ø

Bulgin Cartridge Fuses
1" × ¼"Ø

Bulgin B.S.646 (B) Cartridge Fuses
1¼" × ¼"Ø
(B.S.646 B type)

Bulgin " PAK " Delay Fuses
1¼" × ¼"Ø

¼"Ø GLASS-CARTRIDGE FUSES, ⅝", 1" AND B.S.646B 1¼" SIZE (B.S. 646 (B) AT UP TO 5 A.)

Blowing Factor, 2 × Rating, ± 25% ; clearing within 10 secs.

List Nos.			Carrying Rating	Max. V.*	Colour Code
⅝"*	1"	1¼"✱			
F.90	F.100	F.120	·06 A.	250	Black
F.91	F.101	F.121	·10 A.	250	Grey
F.92	F.102	F.122	·15 A.	250	Red
F.93	F.103	F.123	·25 A.	250	Brown
F.94	F.104	F.124	·50 A.	250	Yellow
F.95	F.105	F.125	·75 A.	250	Green
F.96	F.106	F.126	1·0 A.	250	Dark Blue
F.131	F.107	F.127	1·5 A.	250	Light Blue
F.132	F.108	F.128	2·0 A.	250	Purple
F.133	F.109	F.129	3·0 A.	250	White
F. 89	F.110	F.130	5·0 A.	200	Blk. & White
F.135	F.111	F.35	7·5 A.	150	Printed with Current Rating only
F.136	F.112	F.36	10 A.	125	
F.137	F.113	F.59	12 A.	110	
F.138	F.114	F.37	15 A.	100	
F.139	F.115	F.38	20 A.	60	
F.140	F.116	F.39	25 A.	25	

✱B.S. 646 (B) size.

* F.94, 150 V. ; F.95, 75 V. ; F.96, 35 V. ; F.89 and 131–140, 25 V. (maxima)

1¼" " PAK " CARTRIDGE FUSES

WHERE surges take place as in the primaries of Mains Transformers, Motor Circuits, etc., fuses may blow unnecessarily. PAK types are normally delaying and withstand about +75% over-load for approx. 120 secs. Over-loads of +100–175% of rating give blowing 5–30 secs. Upon the application of over 300% of rating, = +200 over-load, blowing is instantaneous. Fuses should be chosen having regard to the danger current of the circuit rather than with respect to the normal current.

List No.	Carrying
PAK.1	250 mA.
PAK.2	500 mA.
PAK.3	750 mA.
PAK.4	1·0 A.
PAK.5	1·5 A.
PAK.6	2·0 A.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

2½" × ¼"ø HEAVY-DUTY CARTRIDGE FUSES

Heavy-duty Large Fuses 2½" × ¼"ø

BULGIN HEAVY-DUTY GLASS-ENCLOSED CARTRIDGE FUSES

ALL BULGIN CARTRIDGE FUSES are safe, certain and fireproof. These heavy-duty Fuses have heavy glass, visible element, and stout copper end-caps, pressed-coded and heavily Ag.-plated; they constitute reliable safeguards against damage to apparatus by over-load, are simple and easy to replace, of low-Ω, and are inexpensive. They are uniform and accurate, with highly silver-plated contact caps. ALL ratings are of CARRYING (≮ 1,000 hour) CURRENT.

ENSURE SAFETY TO YOUR VALUABLE EQUIPMENT

Blowing Factor, 2 × Rating, ± 50%.

List No.	Carrying	Approx.(min.) Blowing	Max. V.
F.60	100 mA.	150 mA.	500
F.61	150 mA.	220 mA.	500
F.62	220 mA.	330 mA.	500
F.63	330 mA.	480 mA.	500
F.64	470 mA.	700 mA.	500
F.65	680 mA.	1·1 A.	500
F.66	1·0 A.	1·5 A.	450
F.67	1·5 A.	2·2 A.	400
F.68	2·2 A.	3·3 A.	350
F.69	3·3 A.	4·8 A.	300
F.70	4·7 A.	7·0 A.	250
F.71	6·8 A.	11 A.	200
F.72	10 A.	15 A.	175
F.73	15 A.	22 A.	150
F.74	22 A.	33 A.	100

FIT BULGIN INEXPENSIVE RELIABLE FUSES EVERY TIME

E. S.-CAP SCREW-IN FUSES

E. S.-Cap Fuses

THESE units, as almost universally employed in Continental Europe and the Americas, have bright-brass screw caps to B.S.98/E.27, for which a selection of holders is shown on P. 13 of this Catalogue. With black moulded knurled rim, of thermo-setting plastic, and mica-window over legended label. Visible element, shows clearly and instantly when blown.

Suitable for domestic installations, cookers, washers, kinematographs, electronic-apparatus, etc. Made in a wide range of ratings of 1,000-hour carrying capacity at 16° C., and blowing in ≯ 1 sec. at 150–250% of carrying-rating. Knurled rim ø, 1¼"; overall length, 1 9/32".

List No.	(≮ 1,000 hr.) Carrying Current	Minimum Blowing Current	Max. Voltage (across blown Fuse) ~
F.160	1·0 A.	1·5 A.	450
F.161	1·5 A.	2·2 A.	400
F.162	2·2 A.	3·3 A.	350
F.163	3·3 A.	4·9 A.	300
F.164	4·7 A.	7·0 A.	250

List No.	(≮ 1,000 hr.) Carrying Current	Minimum Blowing Current	Max. Voltage (across blown Fuse) ~
F.165	6·8 A.	10 A.	200
F.166	10 A.	15 A.	175
F.167	15 A.	22 A.	150
F.168	22 A.	33 A.	100

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

SINGLE-POLE, E.S.-SIZE
(B.S. 98/E. 27)

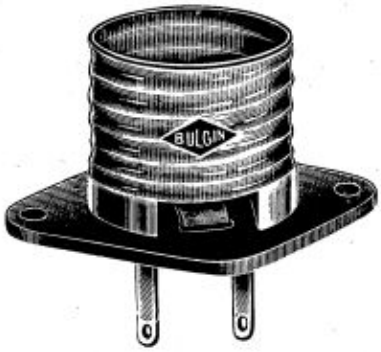
EDISON-SCREW HOLDERS or SOCKETS FOR FUSES, BARRETTERS, LAMPS, etc.

A USEFUL range of E.S. sockets made to the dimensions, fits, and tolerances of **B.S.98/E.27.** With highly-plated non-ferrous shells, contacts, etc., and adequate insulation for use at up to 250 V. 500 V. to E., and max. carrying 5 A. (tags-models), 20 A. (screws-models). Max. test voltage, 1 KV.

All mouldings of highest-grade bakelite, normally black. Any sheet insulation is of highest grade S.R.B.P. Screws Nickel-plated, tags SILVER-plated. Suitable for British, U.S.A. and Continental E.S.-cap items, and the BULGIN E.S. Fuses on p. 12.

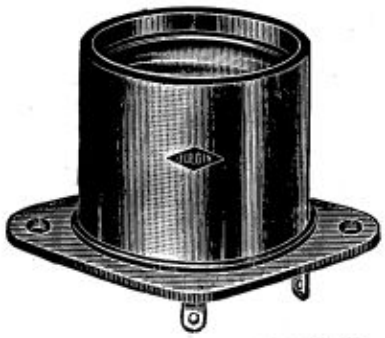
List No.	Description	Connections & Fixing
E.S.1	Moulded-shrouded socket, with 2 × 4 B.A. emergent stems, $\frac{13}{32}$" free length, and two S.R.B.P. gasket plates	2 × 4 B.A. at $\frac{3}{4}$" crs. (2 × 3·8 mm.Ø @ 19 mm. crs.). Bush as requisite, on metal mountings

When fixing E.S.1 to metal chassis allow two clearance holes of $\frac{5}{16}$" (8·5 mm.) Ø, @ crs. given, for 1 KV proof test.



List No.	Description	Connections	Fixing
E.S.2	Skeletonised type, with S.R.B.P. base	Solder tags	2 × $\frac{1}{2}$" clear at 1 $\frac{11}{16}$" crs. (2 × 3·2 mm.Ø @ 39·5 mm. crs.)

When fixing E.S.2 or E.S.3, to metal chassis, allow a 1$\frac{5}{16}$" (33 mm.)Ø clearance hole for 1 KV. proof test.



List No.	Description	Connections	Fixing
E.S.3	As above, but with moulded screwed-on shroud*	Solder tags	2 × $\frac{1}{2}$" clear at 1 $\frac{11}{16}$" crs. (2 × 3·2 mm. Ø @ 39·5 mm. crs.)

* The moulded bakelite screw-on shroud cannot be supplied alone, as a separate item.

List No.	Description	Connections	Fixing
E.S.4	Moulded-shrouded socket, sunk mounting	4 B.A.	2 × 4 B.A. clear at 1$\frac{5}{8}$" crs., central clear hole 1$\frac{1}{2}$"Ø (2 × 3·8 mm.Ø @ 48·25 mm. crs., with central hole 38 mm.Ø)

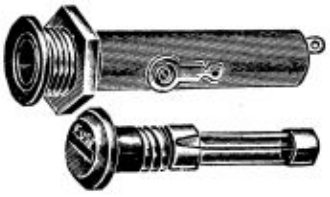
(E.S.-Cap Fuses are shown on page 12, in ratings of 1A. upwards.)

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

PANEL-MOUNTING, SINGLE-POLE

(All supplied : less fuses.)

WHEREVER fuses are to be changed from front or panel of apparatus, these types are unexcelled. Standard sizes of fuses (page 11) are accepted, see table below. **List No. F.55** is a useful type, in great demand, the cover-plug extracting the fuse. Highest-grade S.R.B.P. insulation, moulded cover-plug, and *Ni.*-plated bush 250 V. max. **List No. F.155** is an all-moulded type, thermo-plastic, ' tropical,' with vibration-proof bayonet-engagement of removable part, highly rated because the spring does not carry current. 250 V. max. **List No. P.270 and 330,** much used in car-radio and automobile equipment, takes the second connection to the fuse *through* the plug-portion (p. 128) : it may be used at up to 110 V. if the *Ni.*-plated case is earthed ; chief uses are at up to 50 V.



List No. F.55
These single-pole panel-mounting Fuse-holders are in constant demand, and are often used as units, for multi-pole purposes.

List No.	Description	Connections	Fixing
F.55	Panel-mounting, extractable fuse-holder	Solder tags*	One hole, ½" clearing ∅ Max. Panel thickness, $\frac{9}{32}$"

Notes on Use

List No.	Max. carrying Amps.	Max. circuit volts	Max. V. ~ to E.	SIZE OF FUSE ACCEPTED
F.55	5	250	250	1¼" × ¼"∅

List No. F.155
(F.156 similar)
Moulded-model. Standard sizes of fuses, as tabled, are accepted, up to the max. Amps. figures given.

List No.	Description	Connections	Fixing
F.155	Ditto **All moulded Black**	Solder tags*	One hole, ¼" clearing ∅ **

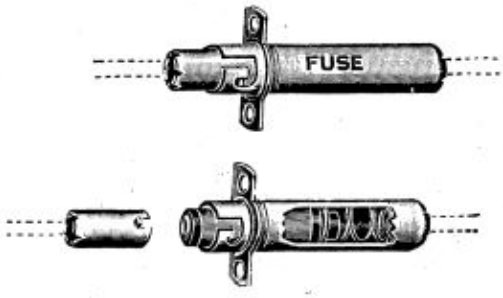
Notes on Use

List No.	Max. carrying Amps.	Max. circuit volts	Max. V.~ to E.	SIZE OF FUSE ACCEPTED
F.155	5	250	1K	1¼" × ¼"∅

List No.	Description	Connections	Fixing
F.156	As F.155, only red moulding not black	Solder-tags	As F.155

Notes on Use

List No.	Max. carrying Amps.	Max. circuit volts	Max. V.~ to E.	SIZE OF FUSE ACCEPTED
F.156	7·5	250	1K	1" × ¼"∅



List Nos. P.330 and P.270
List Nos. P.270 + 330, of size as connectors on page 29 are suitable for mains sub-circuits if with case earthed.

List No.	Description	Connections	Fixing
P.330 and 270	Metal-clad fused socket with plug	Solder cables to plungers	2 × 6 B.A. clear $\frac{33}{64}$" crs., and central hole of ¼"∅

Notes on Use

List No.	Max. carrying Amps.	Max. circuit volts	Max. V. ~ to E.	SIZE OF FUSE ACCEPTED
P.330 and 270	15	With second pole through case, 25 V.†	110 with case earthed	1" × ¼"∅

* Live lead to rear tag. ** Plus key-notch 0·035" × 0·125".
† 25 V. max. with other pole through case, or 110 V. max. with case earthed.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

SINGLE-POLE ; BASE-MOUNTING and FLEX-LEAD MOUNTING

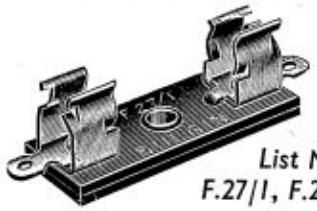
(All supplied : less fuse.)

A RANGE of single-pole Fuse-holders for baseboard- or chassis-mounting, and flex-lead use. Suitable for 1" and 1¼" × ¼"Ø **B.S.646B** fuses as listed below.

With highest grade bakelite-type insulation, moulded or S.R.B.P. sheet, with all metal parts highly-plated—SILVER for contacts and Nickel for exteriors. Suitable for all voltages up to 250≃ and maximum currents as listed. Max. working V. to E., 500. Tested for ⊀ 40 MΩ at 500 V. =; proof test @ 1 KV. 50 ~ (max. test V.), dry, or as shown.

Model **List No. P.270** plus **300** is particularly useful with automobile equipment. The new model, **List No. F.180**, is virtually unbreakable, moulded in tough thermo-plastic material. In both these flex-wire types, the springs do not carry current.

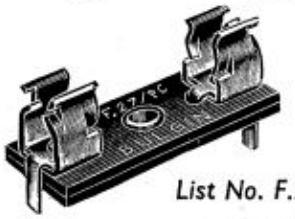
These holders are listed and supplied *without* Fuses, unless otherwise ordered.



List Nos. F.27/1, F.27/2

List No.	Description
F.27/1	Inexpensive type, with solder-tags. Double-laminated S.R.B.P. base .500 V. max. test (dry or recovered) to E.
F.27/2	*do.*, but with *triple-laminated base*, 2 KV. test (dry or recovered) to E.

Fixing Details	O.A. size	Max. Amps.*	Fuses (see pp. 10, 11)
One hole 6 B.A. Clear Central	1 1/16" over Tag × ½" × 5/16" high	7·5	1¼" × ¼"Ø



List No. F.27/PC.

List No.	Description
F27/PC	Type for PRINTED CIRCUITS, With two tags (⅛" projection downwards) and central eyeletted hole. Choice of tag-WIDTHS

Fix by soldering into circuit	TAG-Crs., 1.45 to 1.50 ins.	MAX AMPS., 7.5	For FUSES (see pp. 10, 11):— ¼"Ø × 1¼"

List No. F.180

List No.	Description
F.180	Flexible, moulded (*specify* RED *or* BLACK) with internal terminals. For 250 V. max.

Fixing Details	O.A. size	Max. Amps.	Fuses (see pp. 10, 11)
None ; wire into lead	⅝"Ø × 2½" long	7	1¼" × ¼"Ø

List Nos. P.270 and P.300

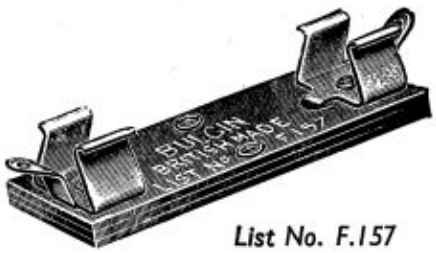
List No.	Description
P.270	PLUG MEMBER, needed with **P.300** Fuseholder
P.300	Metal cased flex-lead Fuse-holder with strong spring contacts. Solder connections

Fixing Details	O.A. Size	Max. Amps.	Fuses (see pp. 10, 11)
None; Flex Connector, wired into lead (P.270)	·320"Ø × 11/16" long	15 @ 110 V. (Case earthed); 30@ 25V.	—
ditto (P.300)	0·4"Ø × 2" long		1" × ¼"Ø

List No. F.142

List No.	Description
F.142	Black moulded, 6 B.A. terminals for 1/·044" or 3/·029" or equivalent cables. Well shrouded

Fixing Details	O.A. Size	Max. Amps.	Fuses (see pp. 10, 11)
One hole ⅛"Ø c/sk. 3/16" Ø @ 90° central	2" × ⅝" × ¾" high	5	1¼" × ¼"Ø



List No. F.157

List No.	Description
F.157	As F.27/1 above, but larger; for 2½" × ½"Ø Fuses, p. 12

Fixing Details	O.A. Size	Max. Amps.	Fuses (see pp. 10, 11)
2 × ·115"Ø holes @ ⅝" crs.	3¼" over tag × 1" × ⅞" high	22	2½" × ½"Ø

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

TWO-POLE, MOULDED, COVERED

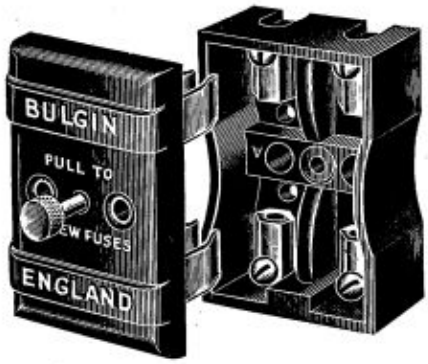
(All supplied : less fuses.)

FUSE-HOLDERS, TWO-POLE

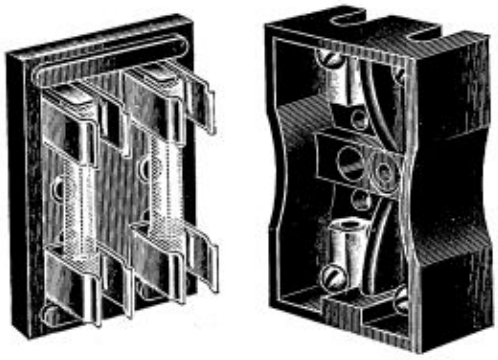
THESE double pole Fuse-holders accept standard $1\frac{1}{4}'' \times \frac{1}{4}''\varnothing$ Cartridge Fuses to B.S.646, shown on page 11. With insulation of highest grade bakelite material, and clips of highest-grade non-ferrous spring material, silver-plated. Terminals are 6 B.A., and accept up to 1/·044", 3/·029" or equivalent cable. Fuses are securely held and List Nos. F.19, 119, 144, are adequately covered for exposed positions of use. For all circuit-voltages up to 250 V. = 500 V. to E. max. I.R., $\not< 40\ M\Omega$ at 500 V. 1 KV. proof test.

These holders are listed and supplied *without* Fuses, unless otherwise ordered.

List No.	Description		
F.144	D.P. Moulded Black Chassis- or baseboard mounting. Fuse-holder with protective cover and securing screw		
Fixing Details	Overall size	Max. Amps.*	Spare Fuses (see p. 11)
Two 6 B.A. clearing holes at $\frac{1}{2}''$ crs.	$2\frac{7}{32}'' \times 1\frac{1}{8}'' \times 1''$ high	5	$1\frac{1}{4}''$



List No.	Description		
F.119	D.P. Moulded Fuse-holder as F.19, but has captive cover as F.144, polarised as to engagement.		
Fixing Details	Overall size	Max. Amps.*	Spare Fuses (see p. 11)
Two 6 B.A. clearing holes at $\frac{5}{16}''$ crs.	$1\frac{7}{16}'' \times 1\frac{1}{4}'' \times 1\frac{1}{8}''$ high	5	$1\frac{1}{4}''$



List No.	Description		
F.19	D.P. Moulded Black Chassis- or baseboard mounting. Fuse-holder with fuses held in clip-on cover, 'dead' for handling and polarised as to engagement		
Fixing Details	Overall size	Max. Amps.*	Spare Fuses (see p. 11)
Two 6 B.A. clearing holes at $\frac{5}{16}''$ crs.	$1\frac{7}{16}'' \times 1\frac{1}{4}'' \times 1\frac{1}{32}''$ high	5	$1\frac{1}{4}''$

* For up to 250 V. ; figures may be doubled for 25 V. max.

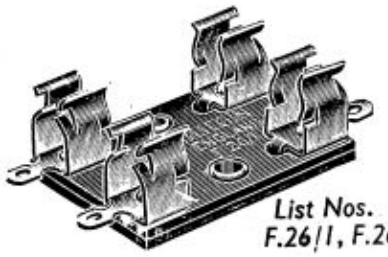
Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

TWO- and THREE-POLE, BASE-MOUNTING

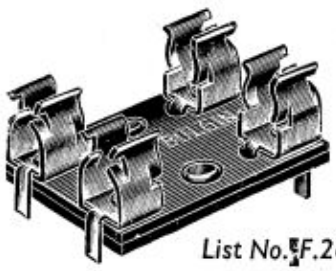
(All supplied : less fuses.)

BASE-MOUNTING FUSE-HOLDERS, TWO- AND THREE-POLE

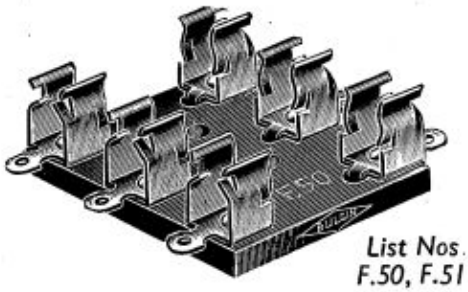
THESE double-and-triple-pole Fuse-holders accept standard $1\frac{1}{4}'' \times \frac{1}{4}''\varnothing$ Cartridge Fuses to B.S.646, shown on page 11. With insulation of highest grade bakelite-type thermo-setting plastics material, and clips of highest-grade non-ferrous spring material, silver-plated. Terminals are 6 B.A., and accept up to 1/·044", 3/·029" or equivalent cable. Fuses are securely held. List No. F.26/1 is an inexpensive type for soldering connections having soldering-tags. For all circuit-voltages up to 250 V. ⎓, 500 V. to E. max. I.R., ≮ 40M Ω at 500 V. 0·5 KV. proof test, or as stated.



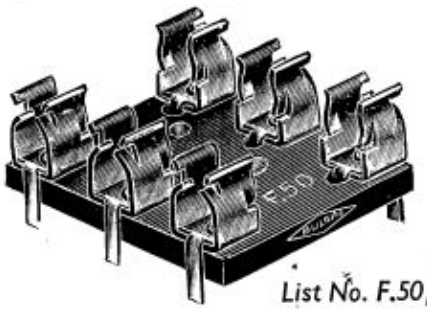
List Nos. F.26/1, F.26/2



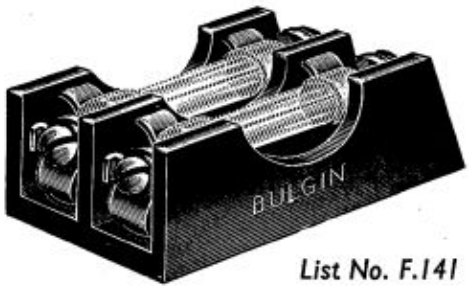
List No. F.26/PC



List Nos. F.50, F.51



List No. F.50/PC



List No. F.141

List No.	Description		
F.26/1	Inexpensive type, S.R.B.P. base, double-laminated		
F.26/2	*do.* type, *triple-laminated base*, for 2KV proof test		
Fixing Details	Overall size	Max. Amps.	Size of Fuses (see p. 11)
Two 6 B.A. clearing holes at $\frac{5}{8}''$ crs.	$1\frac{15}{16}''$ over tags × 1" × $\frac{9}{16}''$ high	5 A. @ 250 V., 10 A. @ 25 V.	$1\frac{1}{4}''$

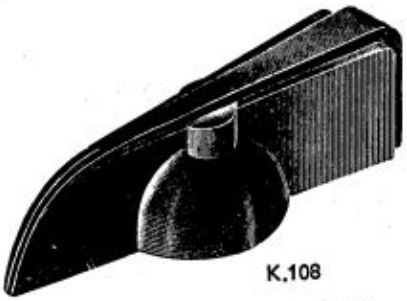
List No.	Description
F.26/PC	Similar holder, with narrow tags, down wards, for soldering (1·45"–1·50" crs. per each pole) into PRINTED CIRCUITS. Choice of tag-WIDTHS

List No.	Description		
F.50	Triple pole, twin-laminated S.R.B.P. base		
F.51	D.P., with Spare Pair Clips *not* fitted with tags, to hold spare fuse. Third position marked 'SPARE.' Supplied less fuses		
Fixing Details	Overall size	Max. Amps.	Size of Fuses (see p. 11)
2–4 B.A. clearing holes at $\frac{5}{8}''$ crs.	$1\frac{9}{16}''$ over tags × $1\frac{5}{8}''$ × $\frac{9}{16}''$ high	5 A. @ 250 V., 10 A. @ 25 V.	$1\frac{1}{4}''$
2–4 B.A. clearing holes at $\frac{3}{4}''$ crs.	$1\frac{13}{16}''$ over tags × $1\frac{7}{8}''$ × $\frac{9}{16}''$ high	5 A. @ 250 V., 10 A. @ 25 V.	$1\frac{1}{4}''$

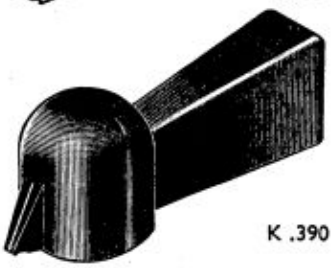
List Nos.	Description
F.50/PC	*do.* item, with narrow tags downwards, for soldering (1·45"–1·50" crs. per each pole) into PRINTED CIRCUITS. Choice of tag-WIDTHS

List No.	Description		
F.141	D.P. Moulded Black Chassis- or baseboard-mounting Fuse-holder		
Fixing Details	Overall size	Max Amps.	Size of Fuses (see p. 11)
Two 6 B.A. clearing holes at $\frac{1}{2}''$ crs.	2" × $1\frac{1}{8}''$ × $\frac{5}{8}''$ high	5 A. @ 250 V. 10 A. @ 25 V.	$1\frac{1}{4}''$

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.


K.108

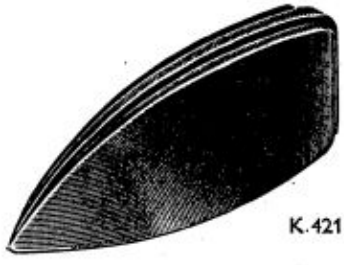

K.60


K .390


K.107, K.357


K.58


K.420


K.421

MOULDED BAKELITE KNOBS

THESE attractively designed knobs are exceptionally well finished and greatly enhance the appearance of radio receivers and similar equipment. They are designed to allow firm 'grip' for accurate control. Highly polished BLACK* thermo-setting bakelite material is the normal stock finish, but certain types as indicated may be supplied in colour, or in thermo-plastic material. Fitted with hardened and well-sunken 4 B.A. grub screws as standard. Where arrowed or beaked, grub screw is at 180° from 'pointer.' For standard $\frac{1}{4}$" ⌀ (0·247"–0·249") shafts, either with or without 'flat.' ALL MODELS have solid turned brass bush-insert, except K.420,421.

List No. with grub screw	Description	Size
K.108	U.S.A. type large instrument knob	Rad. to pointer tip $1\frac{1}{8}$" × $\frac{5}{8}$" h, with $\frac{3}{8}$"⌀ recess, $\frac{5}{32}$" deep, adjacent to panel
K.60	Large instrument knob	Rad. to pointer tip $1\frac{3}{32}$" × $\frac{11}{32}$" h
K.390	Fine-beak Pointer Knob, moulded in polystyrene, **thermo-plastic**	Rad. to pointer-tip, $\frac{7}{16}$"; rad. to handle, $1\frac{1}{4}$". Projection from panel, $\frac{5}{8}$"
K.107	U.S.A. type small instrument knob	Rad. to pointer tip $\frac{5}{8}$" × $\frac{1}{2}$" h, with $\frac{3}{16}$"⌀ recess, $\frac{1}{16}$" deep, adjacent to panel
K.357	U.S.A. type small instrument knob *(Variant of K.107 type)*	Rad. to pointer tip, $\frac{5}{8}$" × $\frac{5}{8}$" h, with $\frac{3}{8}$"⌀ recess, $\frac{9}{32}$" deep, adjacent to panel
K.58	Small instrument knob	Rad. to pointer tip $\frac{11}{16}$" × $\frac{1}{32}$" h

LATEST TYPE STYRON POINTER KNOBS

THESE two new intersleek and streamlined matching control knobs are inspired by the latest leading trends in instrument knob design. Manufactured in glossy black Polystyrene *thermo*-plastic. Each fitted with 4 B.A. steel-screw at 180° from pointer, but not fitted with the usual BULGIN brass insert : screw engages with inset captive nut.

List No.	Description	Size
K.420	Streamlined Pointer Knob in Polystyrene thermo-plastic	Radius to pointer tip $\frac{5}{8}$"
K.421	Larger-size Pointer knob in Polystyrene thermo-plastic	Radius to pointer tip $1\frac{1}{8}$"

**Note.*—Any of the knobs in our range may be supplied in alternative colours providing required quantities warrant special production and subject to colour-match materials being obtainable.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

List No. K.344/P

List No. K.345/P

List No. K.4

List Nos. K.18, etc.
Polished Metal

List No. K.427
Golden (Walnut moulding) or chrome (black moulding)

List No. K.425

MOULDED BAKELITE KNOBS

THESE attractively designed knobs are exceptionally well finished and greatly enhance the appearance of radio receivers and similar equipment. They are designed to allow firm 'grip' for accurate control. Highly polished BLACK thermo-setting bakelite material is the normal stock finish but certain types may be supplied in colour in quantities, or by prior arrangement. Fitted with hardened and well-sunken 4 B.A. grub-screws, as standard, but also available where indicated with grip-spring, for 'push-on'. Where arrowed or beaked, grub-screw is at 180° from 'pointer'. For standard $\frac{1}{4}''\varnothing$ (0·247″–0·249″) shafts, either with or without 'flat'. ALL MODELS have solid turned brass bush-insert. Shaft—'Flat' for 'push-on' to be 0·156″ (= ·003″) thickness from centre of 'flat' to circumference of shaft.

Note.—Any of the knobs in our range may be supplied in alternative colours providing required quantities warrant special production and subject to colour-match materials being obtainable.

List No. (Push-on type only.)	Description	Size
K.344/P	Small circular finger-grip pointer knob Pointer aligned with 'normal' to shaft-flat, to ± 2½°	$1\frac{3}{64}''\varnothing \times \frac{5}{8}''$ h
K.344/2S	Fitted with 2 grub-screws at 120°	$1\frac{3}{64}''\varnothing \times \frac{5}{8}''$ h

List No. (Push-on type only.)	Description	Size
K.345/P	Small circular finger-grip pointer knob Pointer aligned with 'normal' to shaft-flat, to ± 2½°	$1\frac{11}{32}''\varnothing \times \frac{3}{4}''$ h

List No. with grub screw	Description	Size
K.4	Large beaked knob	$1\frac{1}{2}''\varnothing \times \frac{3}{4}''$ h

List No. with grub screw	Description	Size
K.18	Large arrow-line knob (grub-screw @ 180° from arrow-tip)	$1\frac{1}{2}''\varnothing \times \frac{3}{4}''$ h
K.118	Large arrow-line knob (grub-screw @ 90°-clockwise from arrow-tip)	$1\frac{1}{2}''\varnothing \times \frac{3}{4}''$ h
K.119	Similar design to K.118, without arrow	$1\frac{1}{2}''\varnothing \times \frac{3}{4}''$ h

CONTINENTAL STYLE KNOB WITH GOLDEN INSERT

FOLLOWING the latest trend in control-knobs for radios, television sets and tape-recorders, etc., we now offer very attractively styled ribbed and tapered knobs with an insert. These knobs are made to the usual superlative BULGIN standards in finest grade thermo-setting bakelite, and fitted with the anti-fracture heavy brass insert and hardened 4 B.A. grub-screw which is a feature of BULGIN control-knobs.

List No. with grub screw	Description	Size
K.425	Ribbed, tapered, with decorative metal-insert on face State requirements clearly	$1''\varnothing \times \frac{33}{64}''$ h
K.427		$1\frac{5}{16}''\varnothing \times \frac{33}{64}''$ h

NOTE: These Knobs can also be supplied *less* the decorative insert—add '/u' to List No. It is often also possible to supply *WALNUT* (instead of BLACK) *ex stock*

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

MOULDED BAKELITE-TYPE KNOBS

THESE attractively designed knobs are exceptionally well finished and greatly enhance the appearance of radio receivers and similar equipment. They are designed to allow firm 'grip' for accurate control. Highly polished BLACK thermo-setting bakelite material is the normal stock finish but certain types may be supplied in colour, subject to materials being obtainable.* fitted with hardened and well-sunken 4 B.A. grub screws as standard. Where arrowed or beaked, grub screw or grip spring is at 180° from 'pointer'. For standard $\frac{1}{4}$" ⌀ (0·247"–0·249") shafts, either with or without 'flat'. All types are fitted with turned-brass bush-insert.

List No. K.365

List No. with grub screw	Colour*	Description	Size
K.365	—	Cross-ribbed radio or instrument knob	$1\frac{3}{16}$"⌀ × $\frac{5}{8}$" h.

List No. K.6

List No. with grub screw	Colour*	Description	Size
K.6	Black	Small beaked knob	$1\frac{1}{8}$"⌀ × $\frac{5}{8}$" h.

List No. K.94

List No. with grub screw	Colour*	Description	Size
K.94	Black	Small ribbed knob	$\frac{15}{16}$"⌀ $\frac{29}{64}$" h.

List No. with grub screw	Colour*	Description	Size
K.254	Black	Serrated Octagon knob	$1\frac{1}{2}$"⌀ × $\frac{5}{8}$" h.

All grub-screw knobs are normally provided with standard slitted hardened 4 B.A. grub screw and brass insert collar. Normal average length of $\frac{1}{4}$"⌀ shaft accepted in all types is approx. $< \frac{1}{2}$".

* *Note.*—Any of the knobs in our range may be supplied in alternative colours providing required quantities warrant special production and subject to colour-match materials being obtainable.

Materials &/or Finishes to particular specifications can be met, to quantity orders, in special manufacture.

List No. K.254

TELEVISION CONTROL KNOBS

THESE special legended knobs are suitable for all types of television sets, serving to identify controls and avoid 'lost pictures' due to mal-adjustment with non-legended knobs. Moulded in highly polished chocolate-brown thermo-setting bakelite-type material*, with grub screw (4 B.A.). Position of grub screw indicated in illustration.

Size: approx. $1\frac{1}{2}$"⌀ × $\frac{5}{8}$" high (projection). Knurled straight fine for neatness but sure grip.

List No. K.335

List No. Chocolate brown	Legend, gold-filled
K.335	Brilliant
K.337	Contrast
K.339	Volume
K.341	Focus
K.343	Switch

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

MOULDED BAKELITE KNOBS

THESE attractively designed knobs are exceptionally well finished and greatly enhance the appearance of radio receivers and similar equipment. They are designed to allow firm 'grip' for accurate control.

Highly polished BLACK thermo-setting bakelite-type material is the normal stock finish but certain types as indicated may be supplied in colour, subject to materials being obtainable.* Fitted with hardened and well-sunken 4 B.A. grub screws as standard. For standard $\frac{1}{4}$"Ø (0·247"–0·249") shafts either with or without 'flat.' All fitted with turned brass bush-insert.

List No.	Description	Size
K.264	Small American Knob	$1\frac{1}{32}$"Ø × $\frac{23}{32}$" h.

List No.	Description	Size
K.274	Large American Knob	$1\frac{5}{16}$"Ø × $\frac{13}{16}$" h.

List No.	Description	Size
K.244	Rectangular Knob	$\frac{7}{8}$" □ × $\frac{13}{32}$" h.

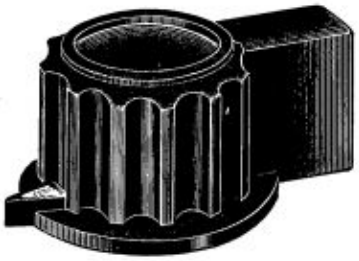
List No.	Description	Size
K.294	Hexagon Knob	$1\frac{5}{32}$"Ø × $\frac{5}{16}$" h.

List No.	Description	Size
K.284	Round Fluted Knob	$1\frac{1}{2}$"Ø × $\frac{5}{8}$" h.

List No.	Description	Size
K.70	Laboratory type Knobs	$1\frac{1}{2}$"Ø × $\frac{5}{8}$" h.

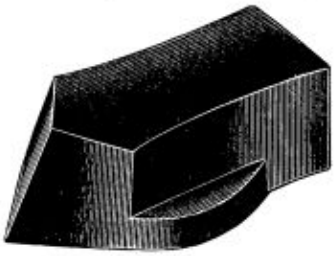
* *Note.*—Any of the knobs in our range may be supplied in alternative colours providing required quantities warrant special production and subject to colour-match materials being obtainable.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

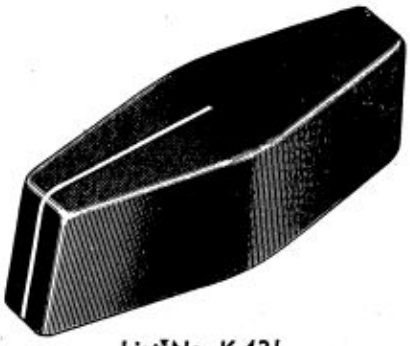


List No. K.433

List No. K.434



List No. K.435



List No. K.431

List No. K.430

NEW STYLE POINTER CONTROL-KNOBS

THESE new Control-Knobs further increase the BULGIN range which now includes pointer knobs for every conceivable use on apparatus of all types. The fluted and finger-form types (**K.433, 434, 435**) are excellent for precision adjustment and delicate location. The bar types (**K.430, 431**) are for use where a strong definite movement is needed, such as change-over switches on TV. etc.

All are manufactured in highly polished glossy black bakelite and fitted with heavy brass 'anti-fracture' insert and 4. B.A. radial grub-screw. Black is the normal stock finish, colours can be manufactured, for *quantity orders*. Pointers and hair lines are filled white as standard or unfilled or special colour-fills to *quantity orders* can be arranged.

List No.	Description (Normal Colour = Black)	Size
K.433	Fluted pointer knob with handle	$\frac{11}{16}$″ h. × 1 $\frac{1}{16}$″ O.A. ⌀ × 1$\frac{1}{2}$ long. $\frac{5}{8}$ pointer from centre

List No.	Description (Normal Colour = Black)	Size
K.434	Plain fluted pointer knob, without handle	$\frac{11}{16}$″ h. × 1 $\frac{1}{16}$″ O.A. ⌀ plus $\frac{5}{8}$ pointer from centre

List No.	Description (Normal Colour = Black)	Size
K.435	'Finger-form' bar pointer-knob	$\frac{1}{2}$″ h. × $\frac{5}{64}$ $\frac{3}{4}$″ O.A. ⌀ × 1$\frac{1}{4}$″ long

List No.	Description (Normal Colour = Black)	Size
K.431	Larger double-ended bar-knob with white index line	$\frac{3}{4}$″ h. × 2″ O.A. length × $\frac{5}{8}$″ max. width

List No.	Description (Normal Colour = Black)	Size
K.430	Small double-ended bar-knob with white index line	$\frac{5}{8}$″ h. × 1$\frac{1}{4}$″ O.A. length × $\frac{9}{16}$″ max. width

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

MOULDED BAKELITE KNOBS

THESE distinctive knobs are moulded in thermo-setting black bakelite-type material, with high surface polish and ultra-smart appearance*. Those for $\frac{1}{4}$"Ø shafts are fitted with well-sunken, hardened steel 4 B.A. grub screws. Afford firm ' grip ' for easy control ; for $\frac{1}{4}$"Ø (0·247" –0·249") shafts, with or without ' flat.' Type K.304 is threaded 2 B.A. and is as used on switches : it is very suitable for all push/pull controlling. All knobs are glossy black unless otherwise arranged or listed. Colours can be had to quantity orders, subject to colour-match materials being available.

K.54

List No. 4 B.A. threaded	Description	Size
K.54	Small switch knob, brass insert—4 B.A. female threaded	$\frac{11}{16}$"Ø × $\frac{23}{64}$" h

K.324

List No. with grub screw	Description	Size
K.324	' Viking's Cap ' knob	$\frac{43}{64}$" A/F × $\frac{5}{16}$" h

K.97

List No.	Colour†		Description	Size
K.97†	Red	Brown	Knobs for push-button tuning switches : push on, self grip to ' flat ' shafts ·187" × ·048" No grub screw	$\frac{3}{8}$"Ø, $\frac{5}{16}$"Ø flange, × $\frac{17}{32}$" h
	Black	White		
	Green	Blue		
	Light Orange			

K.111

List No. with grub screw	Description	Size
K.111	Midget fluted instrument knob	$\frac{3}{4}$"Ø × $\frac{1}{2}$" h

K.133

List No. with grub screw	Description	Size
K.133	' Shell-Nose ' small knob	$\frac{3}{4}$"Ø × $\frac{13}{16}$" h

K.304

List No.	Description	Size
List No., K.304 with 2 B.A. axial threaded hole for $\frac{7}{16}$" depth	Long push-pull knob as on push-pull toggle-switches ; no grub screw	$\frac{3}{4}$"Ø × 1" long ; smaller Ø, $\frac{7}{16}$"

List No. with grub screw	Description	Size
K.314	Hand-wheel knob	1$\frac{1}{2}$"Ø × $\frac{23}{32}$" h

K.314

All grub-screw knobs are normally provided with standard slitted hardened 4 B.A. grub screw and brass insert collar. Normal average length of $\frac{1}{4}$"Ø shaft accepted in all types is approx. $\frac{1}{2}$".

* Note.—Any of the knobs in our range may be supplied in alternative colours providing required quantities warrant special production and subject to colour-match materials being obtainable. † Add colour required when ordering.

Materials &/or Finishes to particular specifications can be met, to quantity orders, in special manufacture.

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

A NEW range of highly-polished glossy Instrument-Knobs, for the highest grade apparatus, each having a choice of coloured Inset Discs or front circular zones, the body colour of the knob being polished BLACK, normally. Apart from smartness and modern decoration, these unique Knobs now make possible the colour-coding of manual-controls. The four sizes constitute a matching set. Each model has strong brass inset-bush, for "$\frac{1}{4}$" ⌀" (=0·247"–0·249" ⌀) shafts, and all have radial 4 B.A. grip-screws.

These Knobs can take the Skirt and Dial accessories on page 25 (opposite).

Body COLOUR	Inset-Disc COLOUR (choice—specify when ordering)
BLACK	with RED, GREEN BLUE, ORANGE-YELLOW, WHITE

List No. K.400/1/Colour

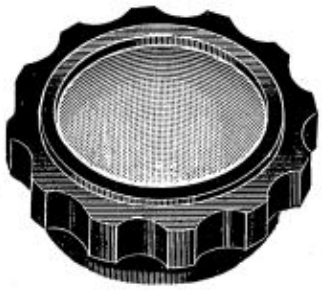
List No.	Description, dimensions, etc.
K.400/1/ Colour (specify)	$\frac{15}{16}$" (23·8 mm.) ⌀ × $\frac{5}{8}$" (15·9 mm.) high; body = BLACK, with central disc colour:— →RED *or* GREEN *or* BLUE *or* ORANGE-YELLOW *or* WHITE

List No. K.401/1/Colour

List No.	Description, dimensions, etc.
K.401/1/ Colour (specify)	$1\frac{5}{32}$" (29·4 mm.) ⌀ × $\frac{11}{16}$" (17·5 mm.) high; body = BLACK, with central disc colour:— →RED *or* GREEN *or* BLUE *or* ORANGE-YELLOW *or* WHITE

List No. K.402/1/Colour

List No.	Description, dimensions, etc.
K.402/1/ Colour (specify)	$1\frac{5}{8}$" (41·3 mm.) ⌀ × $\frac{25}{32}$" (19·9 mm.) high; body = BLACK, with central disc colour:— →RED *or* GREEN *or* BLUE *or* ORANGE-YELLOW *or* WHITE



List No. K.403/1/Colour

List No.	Descriptions, dimensions, etc.
K.403/1/ Colour (specify)	$2\frac{3}{8}$" (60·3 mm.) ⌀ × $\frac{31}{32}$ (24·6 mm.) high; body = BLACK, with central disc colour:— →RED *or* GREEN *or* BLUE *or* ORANGE-YELLOW *or* WHITE.

To quantity orders, or by special pre-arrangement, these Knobs may be had in other colours of both BODY and/or INSET-DISC, subject to materials being available and/or any wanted colour-matching being possible.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

A NEW Range of highly polished glossy Instrument-Knobs and -Dials for the highest grade apparatus, and forming a matching group. Each knob can be used *with* a flat metal dial (normally frosted aluminium as *stock*-finish—special finishes to quantity orders). Each of the three larger types can also, or alternatively, take a skirt-moulding supplement, as shown ; all the knobs can be used alone, if desired. Skirts and dials fix with self-tapping screws (provided). Each knob has strong radial grip-screw(s), 4 B.A. For shafts of "$\frac{1}{4}$"Ø " (0·247"—0·249"Ø).

FITTED WITH BRASS INSERT-BUSHES. FOR $\frac{1}{4}$"Ø SHAFTS✱

K.399

List No.	Item	Dimensions, etc.
K.399	Knob	$\frac{15}{16}$" (23·8 mm.) Ø × $\frac{5}{8}$" (15·9 mm.) high
When dials are also to be used, employ **K.400** (*below*) instead.		

K.400
+*K.410*

List No.	Item	Dimensions, etc.
K.400	Knob	$\frac{15}{16}$" (23·8 mm.)Ø × $\frac{5}{8}$" (15·9 mm.) high
K.410	Dial*	$1\frac{1}{2}$" (38·1 mm.) Ø × 21 S.W.G., engraved 0–10 over 270°
K.410/P	Dial*	ditto, not engraved
* *Rivets* to Knob ; we will fit and rivet, *if requested*		

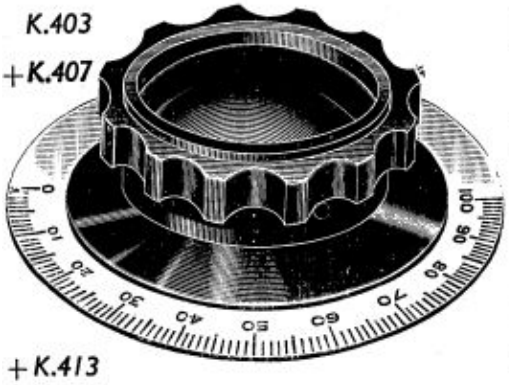
K.401
+*K.405*
+*K.411*

List No.	Item	Dimensions, etc.
K.401	Knob	$1\frac{5}{32}$" (29·4 mm.) Ø × $\frac{11}{16}$" (17·5 mm.) high
K.405	Skirt	$1\frac{1}{2}$" (38·1 mm.) Ø × $\frac{1}{64}$" (5·9 mm.) thick
K.411	Dial	2" (50·8 mm.) Ø × 21 S.W.G., engraved 0–10 over 270°
K.411/P	Dial	ditto, not engraved

K.402
+*K.406*
+*K.412*

List No.	Item	Dimensions, etc.
K.402	Knob	$1\frac{5}{8}$" (41·3 mm.) Ø × $\frac{25}{32}$" (19·9 mm.) high
K.406	Skirt	$2\frac{1}{16}$" (52·4 mm.) Ø × $\frac{1}{64}$" (5·9 mm.) thick
K.412	Dial	$2\frac{3}{4}$" (69·9 mm.) Ø × 21 S.W.G., engraved 0–100 over 180°
K.412/P	Dial	ditto, not engraved

K.403
+*K.407*
+*K.413*

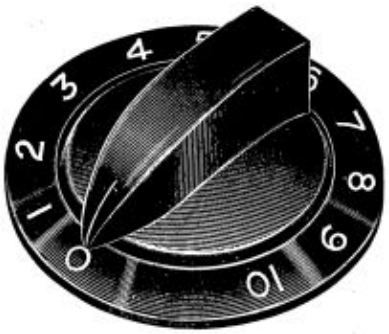


List No.	Item	Dimensions, etc.
K.403	Knob	$2\frac{3}{8}$" (60·3 mm.) Ø × $\frac{31}{32}$" (24·6 mm.) high
K.407	Skirt	3" (76·2 mm.) Ø × $\frac{1}{64}$" (6·8 mm.) thick
K.413	Dial	4" (101·6 mm.) Ø × 21 S.W.G., engraved 0–100 over 180°
K.413/P	Dial	ditto, not engraved

✱ Special-bore-Ø items can be supplied to quantity order

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

POINTER KNOBS AND LEGENDED ESCUTCHEONS



K.370 Knobs + *K.372* Dial

THESE new Control-Knobs and Escutcheons are suitable for all types of radio and electronic instruments and appliances, where precise indication of knob-position or -setting is wanted. The escutcheon fixing is concealed by the circular base of the knob, and the pointer or beak of the knob registers closely with the engraved or engravable rim of the escutcheon. The knobs have engraved pointer line as well as beak, normally filled white ; several standard escutcheon-engravings are available, also blank escutcheons for users' own local engraving—where quantities are too small to warrant special engraving of separate or new moulds. But to quantity orders (where mould tools and their engraving costs are warranted) we are pleased to quote for any special or suitable legending. All these mouldings are normally BLACK, but as colour-match may be available, and for quantity orders, standard bakelite-type colours can be used (thermo-setting). Sizes and details :—

*List No. K.371/1**

List No. K.372 (250°)

List No. K.373 (180°)

List No. K.378 (60°)

List No. K.374

List No. K.375 (40°)

List No. K.376 (100°)

List No. K.377 (160°)

List No. K.382 (270°)

A

B

C

D

E

F

G

Overall-Ø of all Dials, $1\frac{7}{8}$" (47·6 mm.). Front Projection of both items, together, $\frac{11}{16}$" (17·8 mm.). Front Projection of Knob alone, $\frac{9}{16}$" (14·3 mm.), + any clearance to panel. Beak-radius of Knob, $\frac{25}{32}$" (19·8 mm.)

List No.	Description	Use with :—
K.370	Pointer Knob, Black, Line filled WHITE	On $\frac{1}{4}$"Ø (0·247"–0·249") Shafts ; single grub screw fitted
K.370/U	ditto Line NOT "FILLED"	
K.371/1	Dial, plain, for users' engraving	Special Legends
K.372	Dial, filled white, 0, 1–10 over 250°	VC.'s., etc., of 250° swing
K.372/U	Dial, *not filled, ditto*	
K.373	Dial, filled white, 0, 1–10 over 180°	Components of 180° swing, e.g., capacitors, switches
K.373/U	Dial, *not filled, ditto*	
K.374	Dial, filled white, 1–18, over 360°	Full rotation devices, e.g., **S.205** switches
K.374/U	Dial *not filled, ditto*	
K.375	Dial, filled white, 1, 2, 3 over 40°	Switches, S.208, etc.
K.375/U	Dial *not filled, ditto*	
K.376	Dial, filled white, 1–6 over 100°	Switches, **S.207** etc.
K.376/U	Dial *not filled, ditto*	
K.377	Dial, filled white, 1–9 over 160°	Switches **S.206**, etc.
K.377/U	Dial, *not filled, ditto*	
K.378	Dial, filled white, " OFF-ON " (60°)	Rotary Toggle Switches, etc.
K.378/U	Dial, *not filled, ditto*	
K.382	Dial, fitted white, 0, 1–10 over 270°	V.C's., etc., of 270° swing
K.382/U	Dial, *not filled, ditto*	

A selection of further engravings, A–G, are shown. These can be supplied to quantity orders only, at present. (Small quantities can be met by individual engraving of **K.371/1** *above*.) Moulding tools can also be engraved for *other* legends, at competitive prices where quantities warrant.

* Only made in Bakelite type material.

Versions in special materials/finishes (e.g., 'Tropical or Specificational) may be manufactured to special quantity orders.

INSTRUMENT CONTROL KNOBS

A NEW range of BULGIN Instrument Control Knobs, comprising three models of identical style, but in different sizes. The smaller one, **List No. K.360**, measures $1\frac{1}{2}$" ⌀ (overall) × $\frac{19}{32}$" high. **List No. K.361** medium size measures $2\frac{1}{16}$" ⌀ (overall) × $\frac{3}{4}$" high. **List No. K.362**, the largest of the family, measures **3**" ⌀ (overall) × **1**" high.

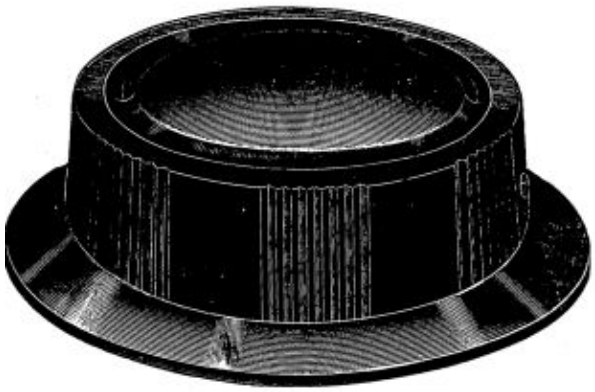
These knobs are made in polished black thermo-setting bakelite, BLACK being the normal finish, but colours are available to quantity orders.*

All to fit shafts ·247"–·249" ⌀ (6·3 mm.) = R.E.C.M.F. standard ⌀, and have radial hardened steel grub screw. But model **K.362** is fitted with TWO 4 B.A. cheesehead screws $\frac{3}{8}$" (9·5 mm.) long. All are suitable for a variety of highest-class electrical and electronic instruments ; the larger knob is ideal for use where extremely delicate and precise adjustment is required in small increments, or for controls of fairly high torque. The introduction of a graded range of three sizes, of matching appearance, will fill a long-felt want.

All models have solid turned brass bush-insert.

List No.	Overall Size		Description
	Height	⌀	
K.360	$\frac{19}{32}$" (15·1 mm.)	1·500" (38·1 mm.)	Small instrument dial knob
		Notes :—	Fitted with one 4 B.A. grub screw $\frac{1}{4}$" (6·3 mm.) long

List No.	Overall Size		Description
	Height	⌀	
K.361	$\frac{3}{4}$" (19·1 mm.)	$2\frac{1}{16}$" (52·4 mm.)	Medium instrument dial knob
		Notes :—	Fitted with one 4 B.A. grub screw $\frac{3}{8}$" (9·5 mm.) long



List No.	Overall Size		Description
	Height	⌀	
K.362	1·000" (25·4 mm.)	3·000" (76·2 mm.)	Large instrument dial knob
		Notes :—	Fitted with two 4 B.A. cheesehead screws $\frac{3}{8}$" (9·5 mm.) long

Millimetre equivalents are approx. only.

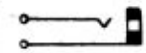
* *Note.*—Any of the knobs in our range may be supplied in alternative colours providing required quantities warrant special production and subject to colour-match materials being obtainable.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

PANEL JACKS

THIS complete range of panel jacks accepts standard plugs and covers practically every conceivable requirement, and different types are listed below for various circuital uses. Each has a $\frac{3}{8}$"Ø fixing bush, suitable for panels of 18 S.W.G.—$\frac{1}{4}$" thickness, and all are in accordance with B.S.666. Depth behind panel is of the order of $2\frac{1}{8}$" only, and ' panel area ' occupied is approx. $\frac{9}{16}$" × $\frac{3}{4}$" average. All contact- and switching-leaves are of high-grade nickel-silver, with SILVER contacts. All insulation of highest-grade bakelite-type S.R.B.P. sheet and P.V.C. The steel-frame, well rust-proofed, will not warp or twist. Solder-tags are heavily SILVER-plated.

Normally supplied complete with front-nut P/No. 1145, nickel-plated, and washer P/No. 1557. Other front-nuts and/or pairs of washers supplied, *if ordered*, at proportionate increases of prices.

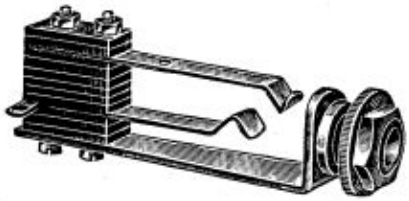
List No.	IDEOGRAM	DESCRIPTION
J.11		Single-leaf: general purpose: outlet for 'phones, L.S., etc.

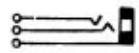
List No.	IDEOGRAM	DESCRIPTION
J.12		As J.11, plus leaf to close circuit upon unplugging.

List No.	IDEOGRAM	DESCRIPTION
J.13		As J.12, plus third leaf, contacted with plug "in."

List No.	IDEOGRAM	DESCRIPTION
J.14		As J.16, with circuit-closing leaves.

List No.	IDEOGRAM	DESCRIPTION
J.15		As J.14, plus circuit-making leaves.



List No.	IDEOGRAM	DESCRIPTION
J.16		Plug-sleeve contacts a leaf as well as plug-tip

All above can be had with rear, not side, -tags—add '**- -/RT**' to List No.

These Jacks and fittings can also be supplied **specially to order,** *in highly climatic-resisting materials-finishes, or non-magnetic, etc., &/or with materials/finishes to special specifications, by special manufacture to quantity orders. Please detail requirements fully when inquiring. (Add '* **T/** *' to List No. for ' Tropical ' or '/R.C.S.1000 ' for R.C.S.1000-grade).*

P/No.1145 P/No.524 P/No.6629

Choice of 3 **metal** *front-nuts ; normally nickel-plated, but chrome-plated, black-nickel, or flor.-bronze to quantity order. One P/No.* 1145 *is supplied nickel-plated,* **unless otherwise ordered.**

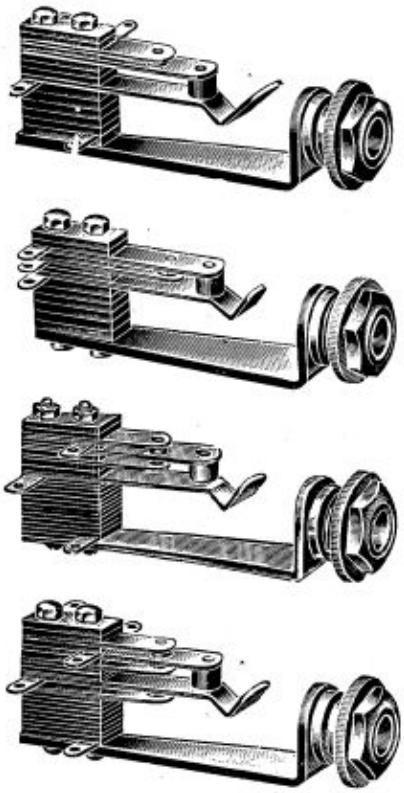
P/No. 6247

Moulded front-nut bushing, normally BLACK or RED (**specify**) *but in GREEN, BLUE, YELLOW, WHITE, to quantity order. Panel hole becomes* $\frac{15}{32}$"–$\frac{1}{2}$"Ø.

P/No.1557 P/No.1058

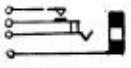
Plain- and embossed-bushing **insulant** *washers. Normally used in pairs, but two of one may be employed. Please specify clearly. Embossed washer requires* $\frac{1}{2}$"Ø *clearing panel hole. One P/No.* 1557 *alone is supplied* **unless otherwise ordered.**

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

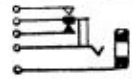


Models J.21, J.22 are not illustrated, but are similar in all respects, and fitted with leaves and contacts as indicated by the Ideograms.

All above can be had with rear, not side, -tags—add '**- -/RT**' to List No.

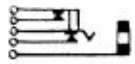
List No.	IDEOGRAM	DESCRIPTION
J.17		As J.11 plus switching (L.T.), 'ON' with plug ' in '

List No.	IDEOGRAM	DESCRIPTION
J.18		As J.11, plus switching (L.T. etc.), ' ON ' with plug ' out.'

List No.	IDEOGRAM	DESCRIPTION
J.19		As J.11, plus switching (L.T. etc.), S.P.C.O.

List No.	IDEOGRAM	DESCRIPTION
J.20		As J.19, plus closed-circuit contact as J.12.

List No.	IDEOGRAM	DESCRIPTION
J.21		As J.12, plus switching (L.T. etc.), ' ON ' with plug ' in.'

List No.	IDEOGRAM	DESCRIPTION
J.22		As J.12, plus switching (L.T. etc.), ' ON ' with plug ' out.'

These Jacks and fittings can also be supplied, ***specially to order,*** *in highly climatic-resisting materials/finishes, or non-magnetic, etc., &/or with materials/finishes to special specifications, by special manufacture to quantity orders. Please detail requirements fully when inquiring.* (*Add* ' /**D.E.F.5000** ' *to List No. for D.E.F.-5000-grade*).

NEW SPECIAL MINIATURE JACKS AND PLUGS

J.30 (left) & P.519

MINIATURE JACK & PLUG

A NEW 2-pole concentric Jack Plug, and Jack, for miniature uses. The Plug has axial cable exit, screw-on phenolic cover, plated members—and internal solder-tags (*Ag.*-plated) for connexions. The Jack has phenolic insulation, nickel-silver contact, and tags, one pole live to fixing-bush ($\frac{5}{16}$"Ø, panel-thickness $\geq \frac{1}{8}$") and a third-contact (mated with tip-contact when plug removed). For 1A. max., 50 V. max., 10 W. max.-load-connected. Max. test V., 250.

Jack: **List No. J.20.** Plug: **List No. P.519**

J.33 (left) & P.523

SUB-MINIATURE JACK & PLUG

AN extremely small 2-pole concentric Jack-Plug and Jack, suitable for the most minute apparatus and equipment. The Plug has internal soldering connexions, snap-on thermo-setting cover, and side cable-exit. The Jack has S.P.B.P. insulation, two *Ag.*-plated contacts and tags. It has 2-hole non-live, fixing to panels ($\frac{1}{16}$" max. thickness) by two holes 8 B.A. clear, $\frac{3}{32}$"Ø @ $\frac{1}{2}$" crs. For 0·5 A. max., 20 V. max., 5 W. max-load connected, max. test, 100 V.

Jack: **List No. J.33** Plug: **List No. P.523**

JACKS & JACK-PLUGS

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

STANDARD JACKS AND JACK-PLUGS

THESE headphone, loudspeaker, and microphone Jacks and Plugs conform to B.S.666 for light telephone and speech connections irreversibly, and other uses. All have insulation materials of the highest quality, mouldings normally black and highly plated metal contacts, for 2-pole working. Within the dimensions of the relative Standard, these are the smallest and neatest components procurable. The closed-circuit jacks are useful for restoration of continuity upon withdrawal of plug, in series connections.

J.6

List No.	Type	Wiring Connections	Mating Components
J.6	Closed-circuit JACK†	Solder-tags	**P.38, P.215**
J.7*	Closed-circuit JACK†	Terminals	**P.38, P.215**
Special Notes		Continuity between tags when PLUG is 'out'	

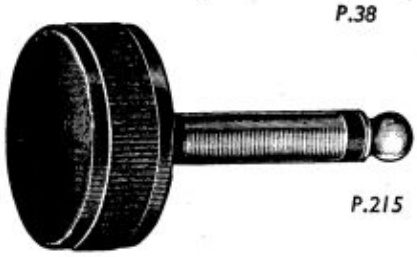
J.2

J.2	Open JACK†	Solder-tags	**P.38, P.215**
J.3*	Open JACK†	Terminals	**P.38, P.215**
Special Notes		General-purpose JACK	

* Not illustrated.

P.38

P.38	Slender-handle Jack-PLUG, for twin-leads	Internal 6B.A. screw terminals, axial exit	**J.2, -3, -6, -7, -11, -22** (pp. 28, 29); **W.J.13, -14** (p. 140)



P.215

P.215	Flat-head Jack-PLUG	Screw Terminals	**J.2, 3, 6, 7, 11–22** (pp. 28, 29) **W.J.13, 14** (p. 140)
Special Notes		Min. projection from panel; side entry for flex	

P.38/P

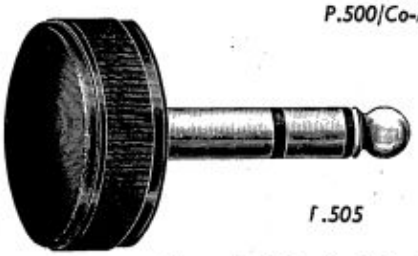
P.38/P.	Unbreakable slender-handle Jack-PLUG, for twin-leads	Internal 6B.A. screw terminals. Axial exit	**J.2, -3, -6, -7, -11 -22** (pp. 28, 29). **W.J. 13, -14** (p. 140)

Being unbreakable, this new plug is ideal for use in installations, hospitals, schools, churches and in the home, in fact everywhere where intercommunication systems and extension of radio is required. Manufactured in "P.V.C." to the same main dimensions as List No. P.38 (above) but has the advantage of unbreakability.

P.500, P.500/Co-Ax.

P.500	Metal-cover** screened jack-PLUG, for twin leads	Internal 6 B.A. screw terminals. Axial exit	**J.2, -3, -6, -7, -11 -22** (pp. 28, 29)
P.500/ Co-Ax.	*ditto*, but for Co-Ax. cable, $\frac{1}{8}$"–$\frac{1}{4}$" outside Ø	Internal clench (and/or solderable) lugs. Axial exit	**W.J.13, -14** (p. 140)

(These two models are useful against electrostatic interference pick-up.)



J.505

NEW 3-POLE TYPE JACK-PLUG

List No.	Type	Wiring Connections	Mating Components
P.505	3-pole version of List No. P.215 above. (Or 2 poles + screen)	Screw Terminals on two poles: tag on tip pole. Side entry for flex	J.14–16 (pp. 28, 29) & any like Jacks having 2 leaves to contact to Plug (3rd connection is *via* Jack-Bush)

†*Note.*—Jack-bushes 'live'; insulating-bushing washers can be supplied; see pp. 28, 29.

**'Live' to tube electrode of plug.


List No. P.179


List No. P.176/1


List No. P.177/1


List No. P.180


List No. P.175/1


List No. P.178


List No. P.105


List No. P.106


List Nos. P.310, 311
(Approx. 1½" ⌀)


List Nos. P.84, 85
(Approx. 2" ⌀)


List Nos. P.80, 82
(Approx. 1½" ⌀)

PLUGS AND SOCKETS

MIDGET PLUGS & SOCKETS FOR ALL USES

THIS range of miniature Plugs & Sockets is suitable for hearing-aids, camera-shutter circuits, and many uses where miniature items are wanted. The moulded flex members are made in high-grade bakelite (normally BLACK), the flex to be clamped below the pin- or socket-collar. Sockets are split, to grip the pins (which are solid). Pin-⌀, $\frac{5}{81}$" ; pin-spacing, ½". Pin & Socket *threads*, 4 B.A.

List No.	Item	Mates with	Fixing	Notes
P.175/1	Plug	P.176/1, P.178	Flex-members	* are Hybrids, or ' Plug-Sockets.' Recommended Max. wkg. volts, 50 ; Max. A., 1.
P.176/1	Socket	P.175/1, P.179		
P.177/1	*	Itself, or P.180		
P.179	Plug	P.176/1, P.178	2 × ⅛"⌀ holes @ ½" crs.	
P.178	Socket	P.175/1, P.179		
P.180	*	Itself, or P.177/1		

TWO-POLE PLUG AND SOCKET

THIS miniature two-pole connector is ideal for use with low voltage portable radio receivers and like equipment. The plug body is moulded in finest-grade ' Bakelite ' and is fitted with SILVER-plated brass pins of ⅛"⌀, tubular for tip-soldered connections, @ ½" crs., and S.R.B.P insulation disc.

List No.	O.A.⌀	Fixing	Rating
P.105 (Plug)	$\frac{29}{32}$"	⅛" Cable hole (side entry)	100 V. max. ; 2 A. max. A.C. or 32 V., max. ; 1 A. max., D.C.
P.106 (Socket)	$\frac{13}{16}$"	⅛"⌀ holes at ½" crs. ¾" Rear of panel projection	

Other Audio-circuit plugs and sockets (including Jacks, Jack-plugs and Wall Jacks)—B.S.666—will be found on pages 27–29.

FLAT-PIN PLUGS AND SOCKETS FOR LOUD-SPEAKERS & 'PHONES

THESE special fittings are designed to the grouped Radio Component Manufacturers' Standards, and B.S.666, for safety connection of head-phones and loud-speakers. By their use, dangerous confusion or cross connection with mains sockets is precluded. Being polarised, reversal of polarity is impossible. Suitable for all domestic extensions as well as for hospital installations, etc. Recommended for 50 V. max., up to 1 A., and for voltages down to 0·1 and ≯ 5 A., thus covering output-signals at all normal impedances.

Fitted with highly plated flat-surface contact-pins and sockets, for safe and positive connection and long working life. Mouldings of polished, black, thermo-setting synthetic-resin. Plug (' inlet ') has cord-gripping space internally, and side-exit. Chassis sockets have 4 Fixing holes, ⅛"⌀, p.c.d. 1¾".

List No.	DESCRIPTION	
P.310	3-PIN PLUG	For use with Head-phones and Loud-speakers
P.311	4-PIN PLUG	For use with Head-phones and Loud-speakers
P.82	3-PIN SURFACE SOCKET	For use with Head-phones and Loud-speakers
P.80	4-PIN SURFACE SOCKET	For use with Head-phones and Loud-speakers
P.85	3-PIN CHASSIS SOCKET	For use with Head-phones and Loud-speakers
P.84	4-PIN CHASSIS SOCKET	For use with Head-phones and Loud-speakers

3-5 AMP., 2 PIN

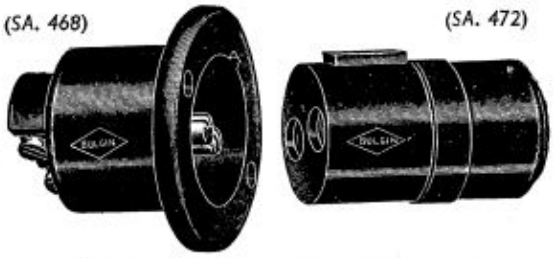
These Plugs and Sockets are sold as complete connectors for flex leads supplying power to apparatus. They are intended for 250 V. ≃ mains. They avoid dangerous cross-connection with other types not intended for this special purpose.

MAINS-CONNECTING PLUGS AND SOCKETS

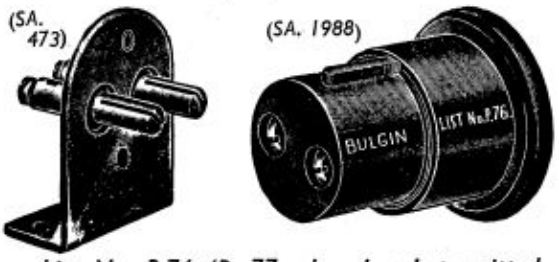
THESE mains fittings provide connections which cannot be confused, or dangerously cross-connected, with other outlets, or inlets. With black mouldings, and plated metallic parts, to ensure clean and certain contact. With the exception of types P.76, 77 and P.97 all models are polarised—reversal of connections is impossible. With terminal connections in both members, except as tabled, and ample space in the SOCKETS for gripping of flex-cable fibre-grip washer being provided in all models except P.200, 260 (which have side exit for cable). For 6–500 V. circuits. Insulation resistance = ∢ 40 M Ω at 750 V. (max. test V.). Caps of SOCKETS allow of captivity to cabinet-back, ensuring compliance with safety-regulations and recommendations.

List No. P.200 (Plug left, Socket right)

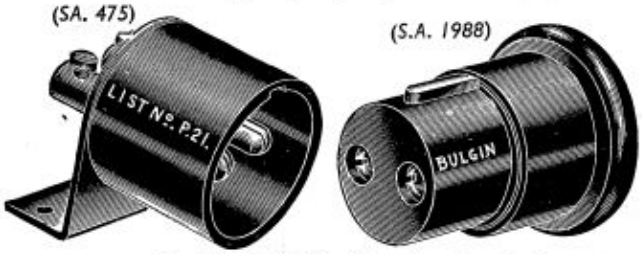
List No. P.260 (Plug left, Socket right)



List No. P.20 (Plug left, Socket right)



List No. P.76 (P. 77 when bracket omitted [SA. 1366]). (Plug left, Socket right)



List No. P.21 (P. 18 when bracket omitted). (Plug left, Socket right)

List No.	No. of Poles	Mounting of PLUG	Amp. Rating per pole, ~ At 6 V.	At 250 V.	At 500 V.
P.200	2	Plug :— 2 × 4 B.A. clear at 1½" crs., with central aperture 1" × ⅝" approx. to clear polar parts Sockets :— 2 × 13/64"Ø at 1 5/16" crs. with central 11/32"Ø hole ; thickness of fixing, up to ⅛"	8	5	1
Notes		Socket attaches to cabinet-*back*, so that both connexions or both poles are broken when apparatus is opened. Non-reversible when fixed. For fixing thicknesses ⩾ ½". Side entry for flex. Solder-tags fitted to PLUG			

P.260	2	Plug :— 2 × 4 B.A. clear at 1½" crs., with central aperture 1" × ⅝" approx. to clear polar parts Socket :— 2 × 5/16"Ø at 1 5/16" crs. with central 5/16"Ø hole; thickness of fixing, up to ⅛"	8	5	1
Notes		Socket attaches to cabinet-*back* so that both connexions or both poles are broken when apparatus is opened. Non-reversible when fixed. For fixing thicknesses ⩾ ½". Side entry for flex. Solder-tags fitted to PLUG**			

P.20	2	Drill 2 × 6 B.A. clear holes at 1 9/32" crs., and central 1 3/16"Ø hole	8	5	1
Notes		Chassis mounting, terminals to both Plug and Socket			

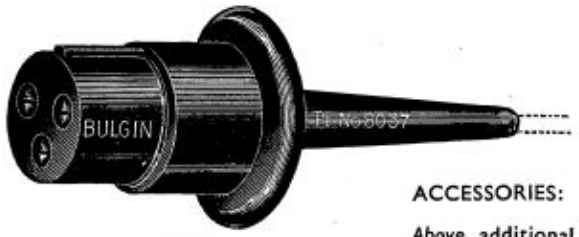
P.76	2*	Bracket ; 2 × 6 B.A. clear, holes at 25/32"†	8	5	1
Notes		Baseboard or top-of-chassis mounting. Terminals to both parts			
P.77	2*	Drill 2 × 6 B.A. clear, holes at ¾"†	8	5	1
Notes		Chassis mounting. Terminals to both parts			

P.18	2	Drill 2 × 6 B.A. clear, holes at ¾"†	8	5	1
Notes		Chassis mounting, terminals to both Plug and Socket			
P.21	2	Bracket ; 2 × 6 B.A. clear, holes at 25/32"†	8	5	1
Notes		Baseboard or top-of-chassis mounting, terminals to both Plug and Socket			

* Reversible as to polarity. ** Solder-tags inside SOCKET also. † Centres on Ø.

These Connectors, as standard, are highly climatic resisting, without need for ' tropical ' (T/*List No.*) versions. They can also be manufactured, specially to quantity orders, to special specifications of materials/finishes.

FOR BASEBOARD MOUNTING MODELS SEE PAGE 39.



ACCESSORIES:

Above, additional p.v.c. cable-grip sleeve, P/NO. 8037.

Left, p.v.c. cover for terminals of PLUG-members, P/No. 8878

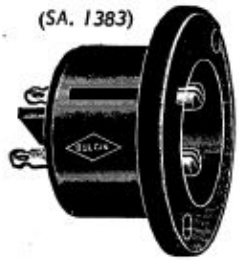
3–5 AMP., 3 PIN and 2 PIN

THESE Plugs and Sockets are sold as complete connectors for flex leads supplying power to apparatus. They are intended for 250 V. ≃ mains. They avoid dangerous cross-connection with other types not intended for this special purpose.

MAINS-CONNECTING PLUGS AND SOCKETS

THESE Connectors are all made in glossy moulded bakelite with NICKEL-plated pins, and terminals or SILVER-plated solder-tags. Alternative cord-grip or cable-strain-relief provisions, and irreversibility of connections. Very low through-mΩ ; 2 KV. proof-test (50 ~).

(SA. 1383)

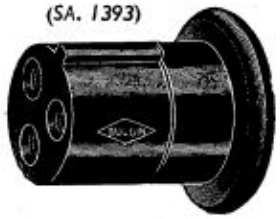


(SA. 1373)

List No.	No. of Poles	Amp. Rating per Pole at 6 V.	at250V.	at500V.	Mounting of Plug portion
P.350†	2	6	3	1	Drill 1 1/16"Ø hole, + 2 × 6 B.A. clear at 1 3/32" crs. on Ø
Notes	For automatic earthing connection also, use 3-pole models. Min.* clearance hole in cabinet back, 1 3/32"Ø				

SA. 1403)

(SA. 1393)



List No.	No. of Poles	Amp. Rating per Pole at 6 V.	at250V.	at500V.	Mounting of Plug portion
P.340†	3	6	3	1	Drill 1 1/16"Ø hole, + 2 × 6 B.A. clear at 1 3/32" crs. on Ø
Notes	For automatic earthing connection also, use 3-pole models. Min * clearance hole in cabinet back, 1 3/32"Ø				

ABOVE :—With Solid Pins and Split Sockets
BELOW :—With Slit Pins and Solid Sockets

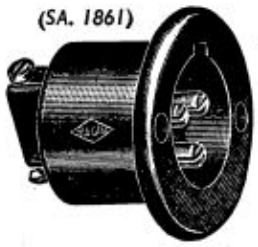
(SA.468)

(SA. 1988)

*

List No.	No. of Poles	Amp. Rating per Pole at 6 V.	at250V.	at500V.	Mounting of Plug portion
P.74	2	8	5	1	Drill 1 1/16"Ø hole, + 2 × 6 B.A. clear at 1 3/32" crs. on Ø
Notes	For automatic earthing connection also, use 3-pole models. Min.* clearance hole in cabinet back, 1 3/32"Ø				

(SA. 1861)



(SA. 1862)

*

List No.	No. of Poles	Amp. Rating per Pole at 6 V.	at250V.	at500V.	Mounting of Plug portion
P.73	3	7	5	1	Drill 1 1/16"Ø hole, + 2 × 6 B.A. clear at 1 3/32" crs. on Ø
Notes	For automatic earthing connection also, use 3-pole models. Min.* clearance hole in cabinet back, 1 3/32"Ø				

* See illustrations showing with 1950 revision of cap or cover of socket portion ; the earlier Ø under socket-head was 3/32". The older types to that dim. may only be suppliable to special arrangement, under No. **Q.573.**

† Both members have solder-tags for connections ; all other List Nos. have 6 B.A. terminals on both members.

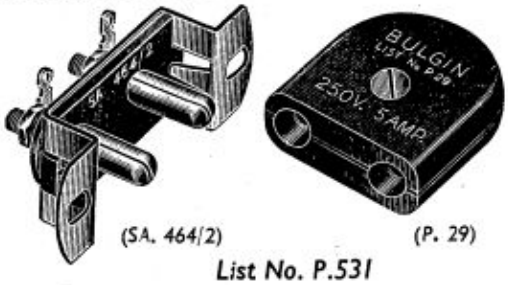
MAINS & LOW-VOLTAGE CONNECTORS

(5A SIZE, SUITABLE FOR 7A, 250 V. ~, MAX.)

5-AMP. SIZE MAINS PLUGS AND SOCKETS AND CONNECTORS

THESE excellent 2-pole mains connectors have "5-A. size" pins and sockets. Fully shrouded sockets in polished bakelite with 6 B.A. terminals and adequate cord-gripping arrangements. They ensure safe and reliable mains connections to all classes of electronic equipment, and avoid possibly-dangerous cross-connections with otherwise circuits. **List No. P.31** is for apparatus, mains-*inwards* : **P.341** provides subsidiary mains-*outwards* for, e.g., gramophone-motor. Highly plated metal parts afford efficient contact. Insulation resistance ≮ 40 M Ω at 500 V. = (2KV. proof test, 50 ~). For 6–250 V. (250 V. normal) working.

Special versions ('Tropical', 'D.E.F. 5000,' etc.) may be offered, to special inquiries for quantities.



(SA. 464/2) (P. 29)

List No. P.531

List No.	No. of Poles	Fixing Arrangements	Amp. Rating per Pole at 6 V.	Amp. Rating per Pole at 250V. ~
P.531	2	Drill 2 × 4 B.A. clear at 1 $\frac{13}{16}$" crs. and make aperture 1 $\frac{3}{8}$" × $\frac{3}{4}$"	10	7
Notes on Uses etc.		General purpose connector for mains input. An improved design on the P. 31 which it replaces, but which can still be supplied to requirements		

(SA. 1767) (P. 28)

List No. P.431, Socket (left) and Plug (right)

List No.	No. of Poles	Fixing Arrangements	Amp. Rating per Pole at 6 V.	Amp. Rating per Pole at 250V. ~
P.431	2	Drill 2 × 4 B.A. clear at 1 $\frac{13}{16}$" crs., and make aperture 1 $\frac{9}{16}$" × $\frac{1}{2}$"	10	7
Notes on Uses		General purpose mains-outlet socket and plug		

List No. P.28 Plug; List No. P.29 Socket

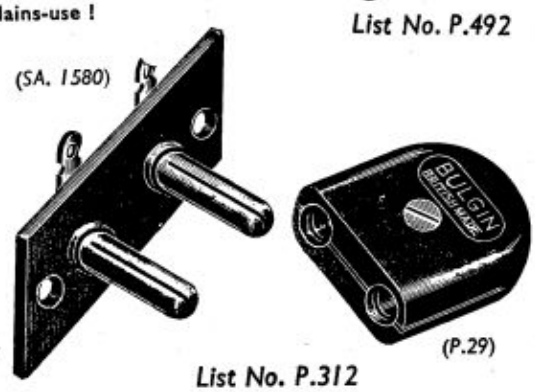
List No.	No. of Poles	Dimensions Overall*	Amp. Rating per Pole at 6 V.	Amp. Rating per Pole at 250V. ~
P.28	2	1$\frac{1}{4}$" (31·7 mm.) + pin length = $\frac{11}{16}$" (18·4 mm.), × 1$\frac{1}{8}$" (28·6 mm.) wide, × $\frac{7}{16}$" (11·1 mm.) thick	10	7
P.29	2	1$\frac{1}{4}$" (31·7 mm.) × 1$\frac{1}{8}$" (28·6 mm.) wide, × $\frac{7}{16}$" (11·1 mm.) thick	10	7
Notes on Uses		General purpose connections : extension mains-leads, etc.		
* Dims. of mated pair, as for **P.492** below.				

This P.492 Plug-Socket Connector is useful, *in pairs*, for irreversible-(polarity maintained) linking of twin cable-lengths. It is not, of course, recommended for Mains-use !

List No. P.492

List No.	No. of Poles	Overall Dimensions (Mated pair)	Amp. Rating per pole at 6 V.	Amp. Rating per pole at 30 V.
P.492	2	2$\frac{1}{2}$" (63·5 mm.) × 1$\frac{1}{8}$" (28·6 mm.) wide, × $\frac{7}{16}$" (11·1 mm.) thick	10	7

(SA. 1580)



(P.29)

List No. P.312

List No.	No. of Poles	Fixing Arrangements	Amp. Rating per pole at 6 V.	Amp. Rating per pole at 250V.
P.312	2	2 fixing holes ·156" Ø at 1$\frac{1}{2}$" centres	10	5

U.S.A. 2-POLE, & 1-POLE U.K., CONNECTORS

(L.V. & MAINS PLUGS & SOCKETS)

(5A & 7A, 250 V. ~, MAX.)

HERE is a further selection of useful Plugs and Sockets for low and mains-voltage working. The types include the useful U.S.A. type with two flat pins, 5A @ 250 V.; a very popular 1-pole lockable type (the Plug-cover screws onto the socket housing, to prevent inadvertent disconnexion); and 1-pole types with '5-Amp'-size electrodes. The plug/socket ratings at higher V. take account of possible separation whilst current passes; higher current is carried without significant heating, and is given for low-V in the tables, on this arc-whilst-separating-controls-rating basis.

List No. P.435

U.S.A. TYPE 2-POLE FLAT-PIN PLUG

List No.	Fixing arrangements of Plug portion	Amp. rating per pole at	
		6 V.	250 V.
P.435	—	10	5
Notes on uses :—	Plug for U.S.A. and Canadian and like sockets for flat-pins at ½" crs. With terminals-cover plate and terminal-screws		

List No. P.485, Plug ; and List No. P.486, Socket

LOCKABLE S.P. PLUG AND SOCKET

List No.	Fixing Arrangements	Amp. Rating @		
		6 V.– 12 V.	250 V. ~	500 V. ~
P.485	Plug ; Flex-Fixing	10 A.	5 A.	5 A.*
P.486	Socket ; ⅜"Ø hole† needed in panel ⅛" thick	10 A.	5 A.	5 A.*

* But only 2 A. if separable on load, and *not* D.C., except from high Ω-source.
† Plus a ' key '-slot 3/32" × 3/64". **Specify BLACK or RED.**

List Nos. P.44, 94 ; Plugs

List Nos. P.45, 95 and P.117, 129, Sockets

5–10A. S.P. PLUGS AND SOCKETS

List No.	Fixing Arrangements	Amp. Rating per Pole at	
		6 V.	250 V. ~
P.44 (Black)	Flex-Fixing PLUG	10	7
P.94 (Red)	Flex-Fixing PLUG	10	7
P.45 (Black)	Flex-Fixing SOCKET	10	7
P.95 (Red)	Flex-Fixing SOCKET	10	7
P.117 (Black)	Panel SOCKET	10	7
P.129 (Red)	Panel SOCKET	10	7

Drill a 13/32"Ø panel hole for insulated mounting; the actual socket-BUSH Ø is ½".*

Other Single-pole plugs/sockets, but of the co-axial or car-radio connector types, with or without fuses—Types **P.270, P.280, P.300, P.330,** are shown on pp. 14, 15, 132.

*Front insulated nose-bush has 'step' of 1/32"Ø ; rear stepped washer suppliable *on request*, **Part No. 1058.**

MAINS CONNECTORS
(OUTLETS)

Versions in special materials/finishes (e.g., ' Tropical ' or specificational) may be manufactured to special quantity orders.

MAINS FACILITY-OUTLET-SOCKET & PLUG

THIS entirely new Component is intended, unlike most of our Mains Connectors on adjoining pages, for proving a mains-connection *from* principal-apparatus or -appliance to a subsidiary. The SOCKET-portion, therefore, would be *live*, and is the chassis-member ; the PLUG is normally *dead*, except when mated. Mounted on panel, the appearance (and sizes) is similar to the INPUT-Mains-Connectors, **P.73, P.340,** on p.31, especially so when mated. Moulded in glossy black moulding material, and with 6 B.A. terminals in both members. Polarised, and non-reversible ; intended for 250 V. max. + Earth. Metal parts of best turned-brass, NICKEL-plated. *Pins* split, *Sockets* solid.

ACCESSORIES:
The two items for cable-sleeve-grip and shrouding, page 33, may be used with **List No. P.437**

(SA. 2019)


(SA. 2020)

List No. P.437
(*Socket* left, *Plug* right)

List No.	Description	Max. Amp. Ratings @ 6–12V. ~	250V. ~	250V. =	Proof Test V., (50 ~)
P.437	Complete Plug & Socket, *Socket to be ' live '*	6 A.	3 A.	1 A.*	2 KV., pole-pole-pole ; poles-chassis

* For separation or de-mating whilst loaded ; otherwise, 3A.

List No.	Dimensions
P.437	SOCKET :— $1\frac{5}{16}$" (39·7 mm.) flange-Ø × $\frac{3}{8}\frac{2}{4}$" (3·6 mm.) flange-thickness, × $1\frac{9}{32}$" (32·5 mm.) overall depth behind flange. Panel-hole :—$1\frac{1}{16}$" (27 mm.) Ø + 2 holes $\frac{1}{8}$" (3·2 mm.) Ø @ $1\frac{9}{32}$" (32·5 mm.) crs.
	PLUG :—$1\frac{3}{8}$" (34·9 mm.) max. Ø × $1\frac{1}{16}$" (27 mm.) thick, + max. length of pins : $\frac{17}{32}$" (13·5 mm.) Mated :—Panel-projection = $1\frac{13}{64}$" (30·6 mm.)

SPARES :—Order as : { **P.437/PLUG Only** or **P.437/SOCKET Only.**

List No. P.437 (*above*). When mated and mounted on panel, the appearance of this complete Plug and Socket is identical to that of the **P.73** and **P.74** complete items (*page* 33). The **P.437** complete Connector being designed as an *outlet* connector enables a uniform panel appearance when used with the **P.73,** etc. *inlet* Connectors. This is yet another small point which illustrates the attention to detail that goes into the design of all BULGIN components.

(SA. 2025)


(SA. 2026)

List No. P.438
(*Socket* left, *Plug* right)

Earth-pins are longer, and of larger-Ø, ensuring first-mating and last-demating, for safety, and preserving polarity. The (live) sockets are adequately sunk and insulated.

SMALL MAINS FACILITY-OUTLET-SOCKET & PLUG

A SIMILAR Plug and Socket for " plugging in subsidiary appliance " (or apparatus) to a Main piece of Equipment or Appliance. When used, it is a match to the INPUT-Mains-Connectors **P.194 (P.247 + 428)** or **P.360 (P.429 + P.430)** on p. 40. Moulded, glossy black, with highly plated metal parts, SILVER-plated where solderable.

List No.	Description	Max. Amp. Ratings @ 6–12V.	250V. ~	250V. =	Proof Test V., (50 ~)
P.438	Complete Plug & Socket, *Socket to be ' live '*	3 A.	1·5 A.	0·5 A.*	1 KV., pole-pole-pole, and poles-chassis

* For separation or de-mating whilst loaded ; otherwise 1·5 A.

List No.	Dimensions
P.438	SOCKET :—$\frac{9}{64}$" (23·4 mm.) Flange-Ø × $\frac{1}{8}$" (3·2 mm.) flange-thickness, × $\frac{15}{16}$" (23·8 mm.) overall depth behind flange. Panel-hole : $\frac{3}{4}$" (19·0 mm.) Ø. Max. panel-thickness (or to counter-bore), $\frac{5}{32}$" (3·9 mm.) A.F. of nut = $\frac{7}{8}$" (22·2 mm.) *Solder-tags for connexions, not terminals.*
	PLUG :—$\frac{11}{16}$" (20·6 mm.) max. Ø × $\frac{19}{32}$" (15 mm.) thick, + max. length of pins : $\frac{37}{64}$" (14·7 mm.) Mated :—Panel-projection = $\frac{23}{32}$" (18·2 mm.)

SPARES :—Order as { **P.438/PLUG only,** or **P.438/SOCKET only.**

I.R. measured @ 500 V. =, ⩾ 50MΩ dry, or recovered from climatic-exposure.

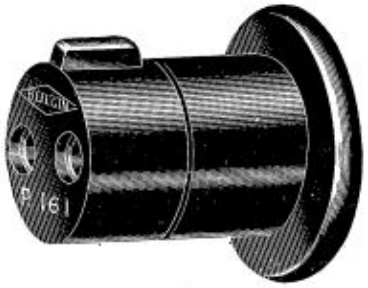
These Connectors, as standard, are highly climatic resisting, without need for 'tropical' (**T**/*List No.*) Versions. They can also be manufactured, specially to quantity orders, to special specifications of materials/finishes.

5·7 AMP RATING AT 250 VOLTS; 2, 3, 6 PINS

THESE excellent mains input-to-apparatus connectors have the conservative "5-A. size" pins and sockets are rated for use at 7 A. 250 V. A.C. (Members with pins are termed "PLUGS.") Fully shrouded in polished, moulded black* bakelite material, with 6 B.A. terminals for connection and adequate cord-gripping arrangements, where required. They ensure safe and reliable mains connections to all classes of electronic equipment, and avoid possibly dangerous cross-connections with other circuits. All models are easily 'locked to cabinet-back' by the mushroom-head of the Socket-portions to comply with safety regulations and are polarised, i.e., reversal of connections is impossible. Highly plated metal parts afford efficient contact. Insulation resistance ≮ 40M Ω at 750 V. (max. *peak* test). For 6–500 V. (250 V. normal) working.

All these BULGIN Connector Sockets have internal fibre-grip for relieving cable-strain from terminals. Additional cable strain or avoidance of sharp exit-angle can be had by separately purchasing and applying the BULGIN sleeve-bushing, for cables approx. ¼"Ø max., Part No. **8037**, as here shown.

PLUG

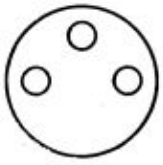


SOCKET

P.161

List No.	No. of Poles	Fixing	~ Amp. rating per pole at 6 V.	250 V.	500 V.	Notes on uses
P.161	2	Drill 1 $\frac{7}{16}$"Ø clearance hole, and 2 × 6 B.A. clear, holes at 1 $\frac{11}{16}$" crs.	10	7 (5, d.c.)	1	General purpose 5 A. mains connector

(Plug, SA. 479; Socket, SA. 478)



P.162

List No.	No. of Poles	Fixing	~ Amp. rating per pole at 6 V.	250 V.	500 V.	Notes on uses
P.162	3	Drill 1 $\frac{7}{16}$"Ø clearance hole, and 2 × 6 B.A. clear, holes at 1 $\frac{11}{16}$" crs.	8	7 (5, d.c.)	1	General purpose 5 A. mains connector with earth pin

(Plug, SA. 480; Socket, SA. 516)

P.166

List No.	No. of Poles	Fixing	~ Amp. rating per pole at 6 V.	250 V.	500 V.	Notes on uses
P.166	6	Drill 1 $\frac{7}{16}$"Ø clearance hole, and 2 × 6 B.A. clear, holes at 1 $\frac{11}{16}$" crs.	8–15	7 (5, d.c.)	1	Multi-mains and power connections

(Plug, SA. 601; Socket, SA. 602)

* Or other colour-match by prior and agreed arrangement.

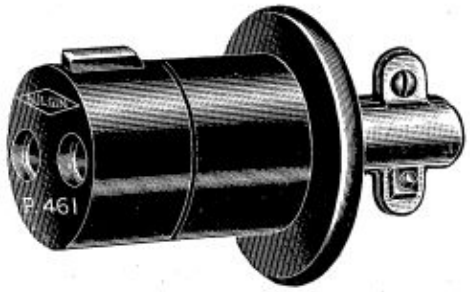
These Connectors, as standard, are highly climatic resisting, without need for ' tropical ' (T/*List Nos.*) versions. They can also be manufactured, specially to quantity orders, to special specifications of materials/finishes.

5-7 AMP RATING AT 250 VOLTS; 2, 3, 6 PINS

THESE excellent mains connectors have the conservative " 5-A. size pins " and sockets for use 7-A. max. 250 V. A.C. (Members with pins are termed " PLUGS.") Fully shrouded in polished, moulded bakelite-type material, with 6 B.A. terminals for connection and adequate cord-gripping arrangements, where required. They ensure safe and reliable mains connections to all classes of electronic equipment, and avoid possibly dangerous cross-connections with other circuits.

All these BULGIN Connector Sockets have internal fibre-grip for relieving cable-strain from terminals. Additional cable grip or avoidance of sharp exit-angle can be had by separately purchasing and applying the BULGIN sleeve-bushing, for cables approx. $\frac{1}{4}$" Ø max., Part No. 8037, as here shown.

PLUG



SOCKET

P.461

List No.	No. of Poles	Fixing	Amp. rating per pole at 6 V.	250V.~	500 V.
P.461	2	Drill 1 $\frac{7}{16}$"Ø clearance hole, and 2 × 6 B.A. clear, holes at 1 $\frac{11}{16}$" crs.	10	7 (5, d.c.)	1

Notes on uses (All fitted with cable-clamp): General purpose 5–7 A. mains Connector

(Plug, SA. 479; Socket, SA. 1932)

P.462

List No.	No. of Poles	Fixing	Amp. rating per pole at 6 V.	250 V.~	500 V.
P.462	3	Drill 1 $\frac{7}{16}$"Ø clearance hole, and 2 × 6 B.A. clear, holes at 1 $\frac{11}{16}$" crs.	8	7 (5, d.c.)	1

Notes on uses (All fitted with cable-clamp): General purpose 5–7 A. mains Connector with earth pin

(Plug, SA. 480; Socket, SA. 1933)

P.466

List No.	No. of Poles	Fixing	Amp. rating per pole at 6 V.	250V.~	500 V.
P.466	6	Drill 1 $\frac{7}{16}$" clearance hole, and 2 × 6 B.A. clear, holes at 1 $\frac{11}{16}$" crs.	8–15	7 (5, d.c.)	1

Notes on uses (All fitted with cable-clamp): Multi-mains and power connections

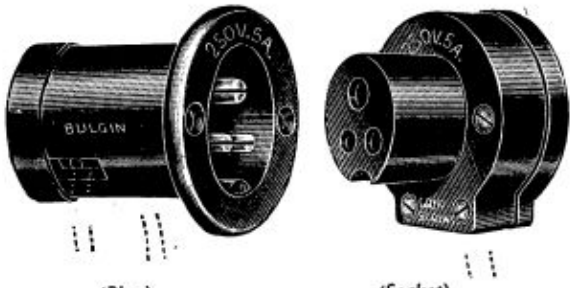
(Plug, SA. 601; Socket, SA. 1934)

SIDE-ENTRY EXTRA-SAFETY MAINS-INLET-CONNECTOR DESIGNED FOR FACTORY INSTALLATIONS, ETC. 5-A. D.C. OR 7-A. A.C., 250 V. MAX.

IMPROVED design of 3-pole Mains-inlet connector, with apparatus-plug and flex socket, capable of handling up to 7-A. at up to 250 V. A.C. or 5-A 250 V. D.C. The *Socket* is provided with improved insulated cable-gripping means, with side exit for cables of up to $\frac{5}{16}$"Ø. Terminals are coded 'L,' 'N,' and 'E,' in the same relationship as the flex connections in a Plug to B.S. 546; ample connection space. The *Plug* has a rear cover to terminals (*for unenclosed apparatus*), and in both parts the terminals and pins or sockets are one-piece, with ample non-stray type conductor-clamping. Made in glossy black bakelite, and conforming to all **latest safety requirements for factories, etc.** It gives a very low mV. drop, with its solid sockets and pins. 'Polarity Keying' is both by pin sizes and unbreakable, protected, contour-key, Earth-electrodes are longer and of larger Ø and mate first, demate last.

Absolute safety is given by the many novel features of this connector.

Specially to quantity order, versions may be manufactured to particular specifications of materials/finishes, but the standard article is inherently highly climatic-resisting.



(*Plug*) (*SA. 1969*) (*Socket*) (*SA. 1970*)

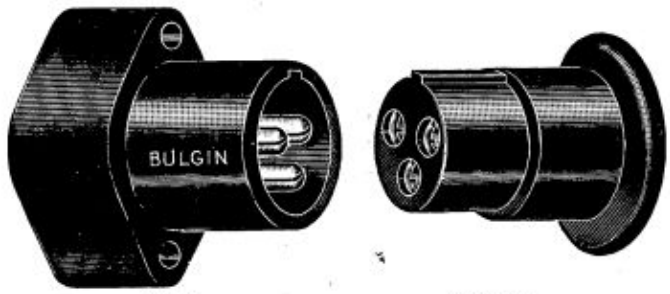
List No. P.453

'CONTAINING' DIMENSIONS

OVERALL, mated: $2\frac{3}{8}$" long. PLUG: $1\frac{9}{16}$" long × $1\frac{9}{16}$"Ø max. Socket: $1\frac{29}{64}$" × 1·552"Ø. Plug fixing: 2 × 6 B.A. clearing holes at $1\frac{1}{4}$" crs. with central clearance hole $1\frac{1}{16}$"Ø. Rear-Projection $1\frac{27}{64}$" less panel thickness. When mated, forwards projection of Sockets = $\frac{61}{64}$". I.R. @ 500 V. =. > 100 MΩ. 2 KV~ proof tests.

NEW MOULDED BASE-BOARD MOUNTING 'P.73, 74' CONNECTORS

(P. 73, 74 Chassis-Plug shown on page 33.)



(*Plug*) (*SA. 2042*) (*Socket*) (*SA. 1862*)

List No. P.73-BB

(P.74 similar, but with 2 pins. Plug, SA. 2041; Socket, SA. 1988)

List No. (Complete)	Fixing Dims. (Plug)	Notes
P.73-BB, P.74-BB	2-fixing holes $\frac{17}{32}$"Ø (4·0 mm.) at $1\frac{11}{32}$" centres	Complete Mains-inlet connector

THESE new Mains, inlet-to-apparatus Connectors (2 and 3-pole) are manufactured in glossy black Bakelite, with ample cable-terminals in hollow base. The apparatus-plug has two knockouts at each side of base, positioned 180° apart, $\frac{1}{4}$" deep × $\frac{1}{4}$" or $\frac{5}{16}$" or $\frac{3}{8}$" wide, as required, for cable acceptance. The Flex-lead-Socket is identical with that in P.73, 74 (page 33).

Technical data :—

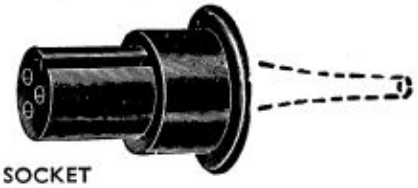
Wkg. rating :—5A., at 250V. max. ≃, or 7A., at 6V. max. I.R. ∢ 40MΩ. at 500V. =, Pole-to-Pole and Poles-to-Earth.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(SMALL PLUGS AND SOCKETS, 1·5–3 A., 250 V.)

MAINS-connecting, one-hole-fixing plugs and sockets fitted with resilient metal sockets, and tubular or solid non-resilient pins in the plug-members, with insulation of highest-grade moulded bakelite. Polarised, non-reversible in mating.

PLUG



SOCKET

All metal polar-parts are SILVER-plated for good connections and ease of soldering; connections by soldering in both members. Keys to fit panels preventing rotation in use.

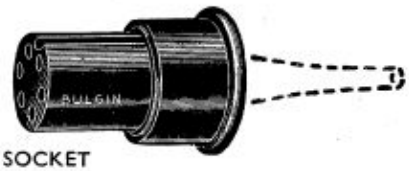
For circuits of 250 V. max., E. ; tested at 1 KV. peak (= max. test voltage). I.R. ∢ 40M Ω at 500 V. ⎓.

Normal finish—black, highly polished.

3-POLE CONNECTORS

List No.	Plug or Socket	Fixing :	Dimensions O.A.	Connections		Amperes at 6 V.	Amperes at 110 V.	Amperes at 250 V.	Description	Mates With
P.360	Plug and Socket	One hole, 750" Ø notched for key ⅛" × ·410" from centre	1⅛" max. Ø × 1 19/32" approx. long	Solder	3	3	2	1·5	Complete Plug and Socket	—
P.429	Plug	—	1⅛"Ø × 51/64" long	,,	3	3	2	,,	Chassis-Plug	P.430
P.430	Socket	—	1⅛"Ø × 1 1/16" long	,,	3	3	2	,,	Flex-Socket	P.429

PLUG



SOCKET

Moulded in highest grade thermo-setting Bakelite, and with heavily SILVER-plated pole parts, giving accurate alignment and contact, these connections find a multitude of uses in all classes of equipment.

6-POLE CONNECTORS

List No.	Plug or Socket	Fixing :	Dimensions O.A.	Connections		Amperes at 6 V.	Amperes at 110V.	Amperes at 250V.	Description	Mates With
P.194	Plug & Socket	as above	1⅛" max. Ø × 1 3/32" approx. long engaged	,,	6	3	2	1·5	Complete Plug&Socket	—
P.427	Plug	as above	1⅛"Ø × 1 23/64" long	,,	6	3	2	,,	Chassis-Plug	P.428
P.428	Socket	—	1⅛"Ø × 1 1/32" long	,,	6	3	2	,,	Flex-Socket	P.427

LIST No P 418 PLUG OR

LIST No P 424 PLUG

List No. P.476. Socket

NEW BULGIN 2-POLE SPECIAL SAFETY CONNECTOR

MODERN safety requirements demand that the cabinet backs of radio and television cannot be removed while the apparatus is " live " to mains.

This **New BULGIN Mains Safety Socket** obviates this danger, by ensuring that the contact between chassis, or apparatus-plugs (**List Nos. P.418** or **P.424** shown above-details on page 41, are suitable types) and the **NEW** design socket (connected to cabinet-back or -door) is broken by the slightest opening of cabinet back. Even a child's small hand cannot be inserted while the chassis is " live."

We claim 100% safety with this new device. There is a choice of chassis plugs (with solder tags, or wire through pins and tip solder). Rating, up to 250 V. ~, up to 2 A. (500 W.). Moulded in highly polished black bakelite.

List No.	Plug or Socket	Fixing : 2 × 6 B.A. clear	Dimensions O.A.	Connections	Amperes at 6 V.	Amperes at 110V.	Amperes at 250V.	Description	Mates With
P.476	Socket	2 holes ·116"Ø, 6 B.A. clear	31/32" × 2·375" approx.	Screw or Solder	4–3	3–2	2–1·5	Door or Cabinet Socket	P.418 424
P.418	Plug	at 1⅜" crs.	1¾" × ½" × 5/16" approx., rear of panel over tags	Solder	4*	3*	2*	Chassis Plug	P.476 and see p.41
P.424	Plug	at 1⅜" crs.	1 9/16" × ½" × 5/16" approx. rear of panel over tags	,,	3	2	1·5	,,	P.476 and see p.41
P.474	Plug & S'kt	Constitutes P.476 and P.418	See above	See above	4	3	2	Complete Connector	—
P.475	Plug & S'kt	Constitutes P.476 and P.424	See above	See above	3	2	1·5	,,	—

* Rating of **P.418**, when used with **P.476** differs from rating when used with other sockets, on p. 41.

(THE UNIQUE 'DOMINA' 2-POLE UNITS FOR MULTI-POLE USES)

THESE connectors, moulded in high-grade phenolic thermo-setting plastic, are intended for inter-connection of chassis and structures (e.g., chassis/rack connections); they can be grouped and used to provide non-reversible or polarised connections. Suitable for up to 500 V. between adjacent poles and to chassis, and for up to 10 A. per pole. When used as separable under load, 250 W. max. loading is suggested. Fixing is by single screw or rivet, a reverse-side or base-side keying spigot being provided for chassis or base, with top-face counterhole for the reverse-side-key from further units when staking, as shown. Also provided with colour-code 'sinks', *but supplied un-coded.* Normal colour of mouldings, BLACK. The Plug-pins are of hard brass, or H.C. Copper, heavily SILVER-plated, and the socket sockets are twin-leaf, normally of Beryllium-Copper, SILVER-plated; the Solder-tag-ends of pins and sockets are integral, with same plating. Mating-centring allows for quite a large degree of variation of alignment. Ask for drawing.

Special Versions—e.g., *to D.E.F. 5000, to special agreed ordering.*

'Domina' 2-pole Unit-Socket List No. P.491

'Domina' 2-pole Unit-Plug List No. P.490

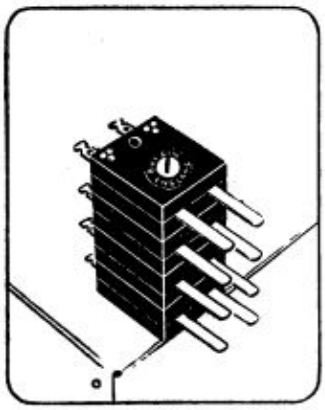
MECHANICAL DATA

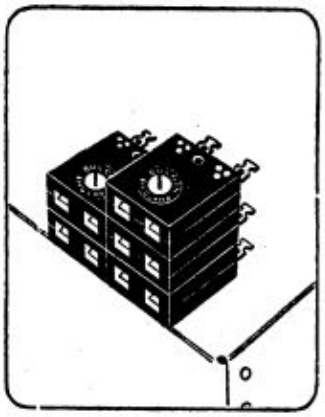
List No.	Two-pole Unit =	Dimensions
P.490	Plug	$\frac{7}{8}$" (22·3 mm.) wide, × 1" (25·4 mm.) + $\frac{9}{32}$" (7·2 mm.) for tag-projection and + $\frac{5}{8}$" (15·9 mm.) for pin-projection; × $\frac{3}{8}$" (9·6 mm.) thick, + key-spigot $\frac{1}{16}$" (1·6 mm.) high (*and see below*)
P.491	Socket	As above, but omit the 'pin projection' dimension. **FIXING (for both)**:— One hole 4 B.A. clear @ 0·350" (8·9 mm.) from mate-face, + hole 0·125" (3·2 mm.) Ø at further $\frac{1}{2}$" (12·7 mm.) crs., both on centre-line.

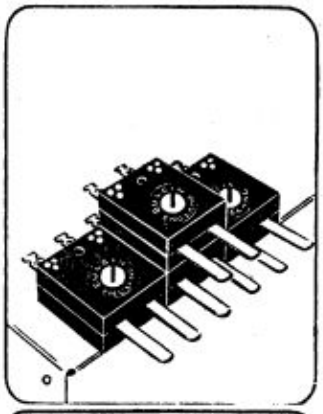
ELECTRICAL DATA

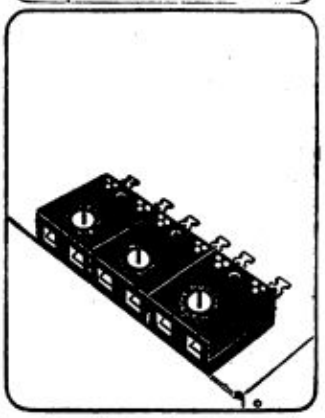
List No.	Two-pole Unit =	Max. Amps @		Max. Proof-Test V., 50 ~		
		Up to 6–12 V. ~	Up to 250 V. ~	Between Poles	Poles to Chassis	Poles of one unit to *do.* of next unit
P.490	Plug	10 A.	5 A.*	2 KV.	1 KV.	2 KV.
P.491	Socket	10 A.	5 A.*	*As above* Average P.D., tag–tag of mated-pole @ 10 A. carrying, 2 V.-prospective, = 10 mV. *max.*		

* For rupturing when loaded. Otherwise 10 A., ~ or = @ 250 V.









These four illustrations show a few of the many various ways of stacking these UNIQUE Components.

AND NOW THE NEW 'BABY-DOMINA'

List No. P.502 (Socket)

List No. P.501 (Plug)

MIDGET VERSION OF THE ABOVE COMPONENT

(*Provisional information only.*)

THIS New midget 2-pole connector is designed for the same applications, only on a smaller scale, as the larger 'DOMINA' above. Moulded in black thermo-setting plastic with silver-plated pins and silver-plated beryllium-copper alloy sockets. Overall dimensions of the moulding are:— $\frac{11}{16}$" long × $\frac{21}{32}$" wide × $\frac{5}{16}$" deep with rear projection of tags = $\frac{5}{32}$". The pins in the plug portion project $\frac{3}{8}$". Fixing is by one hole at 6 B.A. clear $\frac{13}{32}$" from mate-face. Reverse side keying spigots are provided. **List Nos. Plug = P.501. Socket = P.502.** Hybrid, one-pin and one-socket (mates with same item only) = **P.503.**

(SMALL PLUGS AND SOCKETS, 1·5–3 A., 250 V.)

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

2-POLE PLUG AND SOCKET CONNECTORS

A NEW and greatly extended range of Mains-connecting Plugs and Sockets fitted with resilient metal sockets and tubular or solid non-resilient pins in the plug-members, with insulation of highest-grade moulded black bakelite and S.R.B.P. sheet. All metal polar-parts SILVER-plated for good connection and ease of soldering to chassis-plugs ; connections to Flex-plugs and -sockets clampable under metal parts, or solderable, as listed below. For circuits of 250 V. max., ~, tested at 1 KV. ~ (= max. test voltage). I.R. ∢ 40M Ω at 500 V. =

Mouldings normally black, highly polished finish.

These plugs and sockets are small, neat, and reliable, the socket members measuring only $\frac{5}{16}$" × $\frac{13}{16}$" approximately. They are ideal for use with radio, television and other electronic instruments, where space is at a premium and must be conserved. They are suitable for 2-wire or twin feeders, in addition, and many other uses if not being used for mains, and where cross-connections to mains could not take place. Camera-shutter sync.-connection is a typical popular use.

MEMBERS with PINS = PLUGS
MEMBERS with SOCKETS = SOCKETS

P.420 *P.421*

P.414 *with solid sockets* *P.415* *(with slit-pins)*

P.424 *P.420*
(Together = P.422)

P.418 *P.414*
(Together = P.416)

P.420 *P.425*
(Together = P.423)

P.414 *P.419*
(Together = P.417)

2-POLE CONNECTORS (With two $\frac{7}{16}$" Pins of 093"Ø @ ·500" crs.)

List No.	Fixing : 2 × 6 B.A. clear	Dimensions O.A.	Connections	Amperes at 6 V.	110V.	250V.	Mates with
P.420	—	$\frac{27}{32}$" × $\frac{11}{32}$" × $\frac{19}{32}$" long	Clamp	3	2	1·5	P.421 424–5
P.421	—	ditto + pins $\frac{7}{16}$" long	Clamp	3	2	1·5	P.420

(With two $\frac{1}{2}$" Pins of ·125"Ø at ·531" crs.)

List No.	Fixing : 2 × 6 B.A. clear	Dimensions O.A.	Connections	Amperes at 6 V.	110V.	250V.	Mates with
P.414	—	$\frac{7}{8}$" × $\frac{3}{8}$" × $\frac{13}{16}$" long	Clamp	6	4	3	P.451 418–9
P.415	—	ditto + pins $\frac{1}{2}$" long	ditto	6	4	3	P.414

2-POLE CONNECTORS (With two $\frac{7}{16}$" Pins of ·093"Ø @ ·500" crs.)

List No.	Fixing : 2 × 6 B.A. clear	Dimensions O.A.	Connections	Amperes at 6 V.	110V.	250V.	Mates with
P.420	—	$\frac{27}{32}$" × $\frac{11}{32}$" × $\frac{13}{32}$" long	Clamp	3	2	1·5	P.421 424–5
P.422	Combined item ; above Socket *with* Plug below						
P.424	@ $1\frac{3}{8}$" crs.	$1\frac{9}{16}$" × $\frac{1}{2}$" × $\frac{5}{16}$" over Tags, rear of panel approx.	Solder	3	2	1·5	P.420 †

(With two $\frac{1}{2}$" Pins of ·125"Ø at ·531" crs.)

List No.	Fixing : 2 × 6 B.A. clear	Dimensions O.A.	Connections	Amperes at 6 V.	110V.	250V.	Mates with
P.414	—	$\frac{7}{8}$" × $\frac{3}{8}$" × $\frac{13}{16}$" long	Clamp	6	4	3	P.451 418–9
P.416	Combined item ; above Socket *with* Plug below						
P.418	at $1\frac{3}{8}$" crs.	$1\frac{3}{4}$" × $\frac{1}{2}$" × $\frac{5}{16}$" approx., rear of panel over Tags	Solder	6	4	3	P.414 †

2-POLE CONNECTORS (With two $\frac{7}{16}$" Pins of ·093"Ø @ ·500" crs.)

List No.	Fixing : 2 × 6 B.A. clear	Dimensions O.A.	Connections	Amperes at 6 V.	110V.	250V.	Mates with
P.420	—	$\frac{27}{32}$" × $\frac{11}{32}$" × $\frac{13}{32}$" long	Clamp	3	2	1·5	P.421 424–5
P.423	Combined item ; above Socket *with* Plug below						
P.425	@ $1\frac{3}{8}$" crs.	$1\frac{3}{16}$" × $\frac{1}{2}$" × $\frac{7}{8}$" rear of panel approx.	Solder	3	2	1·5	P.420

(With two $\frac{1}{2}$" Pins of ·125"Ø at ·531" crs.)

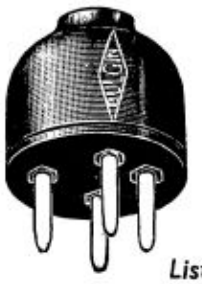
List No.	Fixing : 2 × 6 B.A. clear	Dimensions O.A.	Connections	Amperes at 6 V.	110V.	250V.	Mates with
P.414	—	$\frac{7}{8}$" × $\frac{3}{8}$" × $\frac{13}{16}$" long	Clamp	6	4	3	P.451 418–9
P.417	Combined item ; above Socket *with* Plug below						
P.419	at $1\frac{3}{8}$" crs.	$1\frac{3}{4}$" × $\frac{1}{2}$" × $\frac{7}{8}$" approx., rear of Panel over Tags	Solder	6	4	3	P.414

† Also mates with P.476, see p. 40

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(CONNECTORS TO BRITISH VALVE-BASES STANDARDS, 4, 5, 7 PIN)

These Plugs and Sockets have metallic pins and sockets conforming to **B.S.448** (valve bases, English types, phenolic types in size, length, spacing, etc.) Complete Connectors **P.449, 450**, are similar, but with shorter pins.
Note: PLUGS have *Pins*, and SOCKETS have *Sockets*.



List No. P.9

CABLE-PLUGS & SOCKETS

ON this and the facing page are a comprehensive range of cable-plugs (or valve-holder adaptors) and cable-sockets (or flex-lead valve-sockets) covering a wide range of uses for inter-connecting amplifiers, ' tuning-eyes,' test gear, and so on. Moulded in highly polished, normally black, thermo-setting bakelite type material, with SILVER-plated pins for easy and reliable connections.

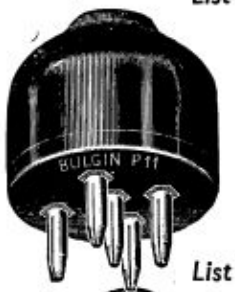
List No.	Plug or Socket	Spacing and poles	Internal Connections	Amps. per pole
P.9	P	Eng. 4	Screws	1
P.3	P	Eng. 5	Screws	1

List No. P.71

List No.	Plug or Socket	Spacing and poles	Internal Connections	Amps. per pole
P.71	P	Eng. 5	Solder through pins	2
P.72	P	Eng. 7	Solder through pins	2
P.63	P	Eng. 9	Solder through pins	2

List No. P.75

List No.	Plug or Socket	Spacing and poles	Internal Connections	Amps. per pole
P.75	S	Eng. 5	Solder-tags	2
P.67	S	Eng. 7	Solder-tags	2
P.69	S	Eng. 9	Solder-tags	2



List No. P.11

Connections are to internal screws or tags, or through hollow pins to tip-solder-joints.

These Connectors are widely used for 4-pole cable connection in a variety of equipment and appliances. They are suitable for up to 500 V. use in sub-circuits of comparative internal resistance, but are *not* advised for MAINS.

List No. C.19

List No.	Plug or Socket	Spacing and poles	Internal Connections	Amps. per pole
P.10	P	Eng. 4	Screws	1
P.11	P	Eng. 5	Screws	1
C.18	S	Eng. 4	Screws	1
C.19	S	Eng. 5	Screws	1
P.449	P+S	Eng. 4	Screws	1
P.450	P+S	Eng. 5	Screws	1

See page 137 for Valveholders

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

(CONNECTORS TO BRITISH VALVE-BASES, ETC., STANDARDS INTERNAT.-OCTAL AND 12-PIN)

These Plugs and Sockets compare accurately to International-Octal dimensions (B.S.448) and "C.R.T. 12-pin and Spigot" dimensions.

MOULDED CABLE-PLUGS AND SOCKETS

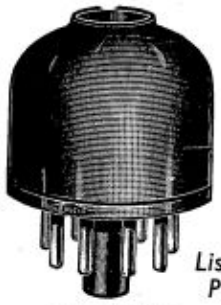
USEFUL for multi-pole cable-connection, inter-chassis or panel cabling, etc. Moulded in glossy black bakelite with SILVER-plated pins for ease of tip-soldering.

List No. P.408

List No.	Plug or Socket	Spacing and poles	Internal Connections	Amps. per pole
P.408	P	Internat. Octal	Solder through pins	1

List No. V.H.60

List No.	Plug or Socket	Spacing and poles	Internal Connections	Amps. per pole
V.H.60	S	Internat. Octal	Solder-tags	1



List No. P.112

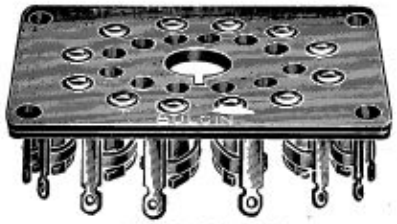
List No.	Plug or Socket	Spacing and poles	Internal Connections	Amps. per pole
P.112	P	Internat. Octal	Solder through pins	1

List No. P.448

List No.	Plug or Socket	Spacing and poles	Internal Connections	Amps. per pole
P.448	P	Internat. Octal	Solder through pins	1

List No. P.245

List No.	Plug or Socket	Spacing and poles	Internal Connections	Amps. per pole
P.245	P	C.R.T. 12 + Spigot	Solder through pins	3



List No. V.H.80

List No.	Plug or Socket	Spacing and poles	Internal Connections	Amps. per pole
V.H.80	S	C.R.T. 12 + Spigot	Solder-tags	3

See page 137 for Valveholders

SINGLE-LAYER WIRE-WOUND RESISTORS, 4–10 WATTS RATING

THESE Resistors are wound with highest grades of oxidised wires of low corrodibility. In all possible cases, ' constant-Ω ' *Ni.-Cu.* alloys are used. Formers are unglazed refractory with bore ⌀ ≮ 0·1". Terminal bands of brass, highly SILVER-plated ; connections to be lashed-and-soldered. Additional tapping-bands can be supplied at extra cost ; use of these reduces overall-Ω proportionately to amount of element abridged. Resistance accuracy, normally ± 10%. Some wire-end types, as illustrated and tabled, are also available ; these cannot take taps, and are generally without any bore or central-hole.

All types may have unglazed refractory coating applied if desired and cannot then be tapped.

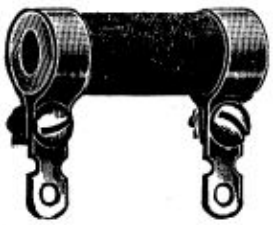
5 WATTS

List Nos. R.33–41

5-WATT WIRE-END RESISTORS
1½" × ¼"Ø approx.

Ω	List No.	Max. V.-drop	Max. mA.	Ω	List No.	Max. V.-drop	Max. mA.
100	**R.33**	22·4	224	500	**R.38**	50·0	100
150	**R.34**	27·3	182	700	**R.39**	59·5	85
200	**R.35**	31·6	158	750	—	—	—
250	**R.36**	35·0	140	1·00K.	**R.41**	71·0	71

4 WATTS



List Nos. P.R.140–159

4-WATT TAG-END RESISTORS
1" × 1/32"Ø approx.

Ω	List No.	Max. V.-drop	Max. mA.	Ω	List No.	Max. V.-drop	Max. mA.
2	**P.R.140**	2·80	1400	75	**P.R.150**	17·30	230
3·5	**P.R.141**	3·66	1050	100	**P.R.151**	20·00	200
5	**P.R.142**	4·50	900	150	**P.R.152**	24·50	163
7·5	**P.R.143**	5·45	730	200	**P.R.153**	28·00	140
10	**P.R.144**	6·30	630	250	**P.R.154**	31·40	125
15	**P.R.145**	7·60	520	350	**P.R.155**	36·80	105
20	**P.R.146**	9·00	450	500	**P.R.156**	45·00	90
25	**P.R.147**	10·00	400	750	**P.R.157**	54·50	73
35	**P.R.148**	11·90	340	1·00K	**P.R.158**	63·00	63
50	**P.R.149**	14·00	280	2·50K	**P.R.159**	100·00	40

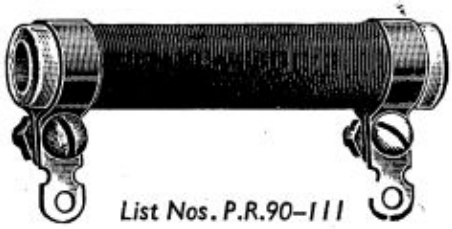
6 WATTS

List Nos. P.R.120–139

6-WATT TAG-END RESISTORS
1⅜" × 1/32"Ø approx.

Ω	List No.	Max. V.-drop	Max. mA.	Ω	List No.	Max. V.-drop	Max. mA.
1	**P.R.120**	2·45	2450	100	**P.R.130**	24·50	245
2	**P.R.121**	3·46	1730	150	**P.R.131**	30·00	200
5	**P.R.122**	5·50	1100	200	**P.R.132**	34·60	173
7·5	**P.R.123**	6·75	900	300	**P.R.133**	42·00	140
10	**P.R.124**	7·75	775	400	**P.R.134**	48·80	122
15	**P.R.125**	9·40	630	500	**P.R.135**	55·00	110
20	**P.R.126**	11·00	550	750	**P.R.136**	67·50	90
30	**P.R.127**	13·50	450	1·00K	**P.R.137**	78·00	78
50	**P.R.128**	17·50	350	1·75K	**P.R.138**	100·00	60
75	**P.R.129**	21·00	280	4·00K	**P.R.139**	156·00	39

10 WATTS



List Nos. P.R.90–111

10-WATT TAG-END RESISTORS
1¾" × 1/32"Ø approx.

Ω	List No.	Max. V.-drop	Max. mA.	Ω	List No.	Max. V.-drop	Max. mA.
1·5	**P.R.90**	3·90	2600	100	**P.R.101**	31·60	316
3	**P.R.91**	5·40	1800	150	**P.R.102**	39·00	260
5·7	**P.R.92**	7·50	1320	250	**P.R.103**	50·00	200
7·5	**P.R.93**	8·60	1150	300	**P.R.104**	54·00	180
10	**P.R.94**	10·00	1000	400	**P.R.105**	64·00	160
15	**P.R.95**	12·30	820	500	**P.R.106**	70·00	140
20	**P.R.96**	14·00	700	750	**P.R.107**	86·50	115
30	**P.R.97**	17·40	580	1·00K	**P.R.108**	100·00	100
40	**P.R.98**	20·00	500	1·50K	**P.R.109**	123·00	82
50	**P.R.99**	22·50	450	2·50K	**P.R.110**	158·00	63
75	**P.R.100**	27·50	365	5·00K	**P.R.111**	225·00	45

Ratings.—Listed ratings give approximately 240° C. surface temperature from 16° C. ambient, adequate convection cooling being used. For lower surface temperatures and/or at higher ambients, or with restricted ventilation, de-rate accordingly.

SOLENOIDAL SINGLE-LAYER 30–100 W. RESISTORS

ALMOST useful range of heavy-duty resistors designed to meet practically all requirements for power-handling types, in light electrical and radio equipment. Except in a few of the higher-Ω models, constant-Ω nickel alloy wires are used, only the highest grades being employed—as atmosphere-resistant as possible (for normal atmospheres)—with oxide insulation to the contiguous turns. Wound on heat-resisting formers, and rated to achieve ⩾ 450° F. surface temperature *with abundant ventilation*, from 60° F. ambient. To be de-rated for use at higher ambients and/or lower working °F
Ω-tolerance, ± 10%.
With SILVER-plated contact- and terminal-bands.

List Nos. P.R.170–191

30-WATT SIZE 3½" long × ⅝"Ø

Ω	List No.	Max. V.-drop	Max. I	Ω	List No.	Max. V.-drop	Max. I
3	P.R.170	9·45	3·15A	150	P.R.180	67·5	450mA
6	P.R.171	13·3	2·23A	200	P.R.181	77·0	385mA
10	P.R.172	17·2	1·72A	250	P.R.182	87·5	350mA
20	P.R.173	24·4	1·22A	300	P.R.183	94·5	315mA
25	P.R.174	27·5	1·10A	500	P.R.184	122	245mA
30	P.R.175	30·0	1·00A	700	P.R.185	143	205mA
40	P.R.176	34·2	860mA	1·0K	P.R.186	172	172mA
50	P.R.177	38·5	770mA	3·0K	P.R.189	300	100mA
75	P.R.178	47·2	630mA	5·0K	P.R.190	385	77mA
100	P.R.179	55·0	550mA	9·0K	P.R.191	522	58mA

List Nos. P.R.199–217

60-WATT SIZE 4¾" long × 1⅜"Ø

Ω	List No.	Max. V.-drop	Max. I	Ω	List No.	Max. V.-drop	Max. I
2·5	P.R.199	12·2	4·9A	250	P.R.209	122	490mA
6	P.R.200	18·6	3·1A	500	P.R.210	175	350mA
8	P.R.201	21·6	2·7A	750	P.R.211	210	280mA
14	P.R.202	29·4	2·1A	1·0K	P.R.212	245	245mA
20	P.R.203	34·0	1·7A	1·5K	P.R.213	300	200mA
30	P.R.204	42·0	1·4A	2·0K	P.R.214	344	172mA
50	P.R.205	55·0	1·1A	4·0K	P.R.215	488	122mA
90	P.R.206	73·8	820mA	6·0K	P.R.216	600	100mA
150	P.R.207	94·5	630mA	10·0K	P.R.217	770	77mA
200	P.R.208	110	550mA				

List Nos. P.R.220–235

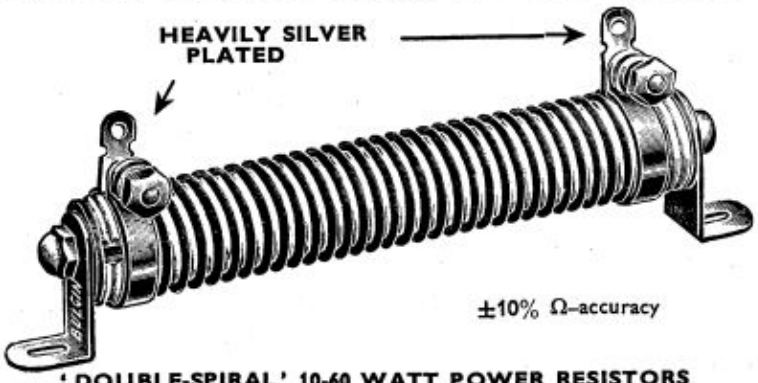
80-WATT SIZE 6" long × 1⅜"Ø

Ω	List No.	Max. V.-drop	Max. I	Ω	List No.	Max. V.-drop	Max. I
10	P.R.220	28·0	2·8A	250	P.R.228	142	570mA
20	P.R.221	40·0	2·0A	350	P.R.229	168	480mA
30	P.R.222	48·0	1·6A	500	P.R.230	200	400mA
40	P.R.223	56·0	1·4A	750	P.R.231	243	325mA
50	P.R.224	62·5	1·25A	1·0K	P.R.232	280	280mA
75	P.R.225	78·8	1·05A	2·0K	P.R.233	400	200mA
100	P.R.226	90·0	900mA	5·0K	P.R.234	625	125mA
150	P.R.227	109	730mA	10·0K	P.R.235	900	90mA

List Nos. P.R.240–253

100-WATT SIZE 6" long × 1½"Ø

Ω	List No.	Max. V.-drop	Max. I	Ω	List No.	Max. V.-drop	Max. I
5	P.R.240	22·5	4·5A	200	P.R.247	142	710mA
9	P.R.241	29·7	3·3A	350	P.R.248	187	535mA
17	P.R.242	40 8	2·4A	500	P.R.249	225	450mA
25	P.R.243	50·0	2·0A	1·0K	P.R.250	315	315mA
50	P.R.244	70·0	1·4A	2·5K	P.R.251	500	200mA
100	P.R.245	100	1·0A	5·0K	P.R.252	700	140mA
150	P.R.246	123	820mA	10·0K	P.R.253	1·0K	100mA



'DOUBLE-SPIRAL' 10-60 WATT POWER RESISTORS

THESE useful resistors are made in different sizes and ratings to suit all requirements, and have been still further improved in design and materials. The highest quality obtainable, oxidised non-corrodible resistance wire is now helically wound on a braided core of *glass-fibres*, obviating any possibility of internal attack on the wire. This cord is wound on an unglazed refractory core, and held by terminating clamp bands, for lashed and/or soldered connections. For use at up to 450° F. surface temperature from 60° F. ambient—adequate ventilation to be provided. For higher ambients, lower working temperatures, or restricted ventilation, de-rate proportionately. Heavily *SILVER*-plated connection bands and solder-tags.

Max. wkg. V. to earth, 1,000. Max. V. across terminals, 750. Max. test V. to E., 1,500 *peak*. Extra terminal-bands for tapping, may be provided at extra cost (please state List No. of resistor to be tapped). Note:—tappings reduce the overall-Ω proportionately to the amount of element bridged.

Ω	10-WATT SIZE 1¾" × ¼" × 1/16" h. End brackets not supplied			20-WATT SIZE 3 5/32" × 21/32" × 1 15/32" h. End brackets fitted			40-WATT SIZE 4 19/32" × 5/16" × 1 13/32" h. End brackets fitted			60-WATT SIZE 6 1/32" × 5/16" × 1 13/32" h. End brackets fitted		
	List No.	Max. mA.	Max. V.	List No.	Max. mA.	Max. V.	List No.	Max. mA.	Max. V.	List No.	Max. mA.	Max. V.
25	P.R.45	630	15·75	—	—	—	—	—	—	—	—	—
50	P.R.46	447	22·35	P.R.22	632	31·6	—	—	—	—	—	—
100	P.R.47	316	31·6	P.R.23	447	44·7	P.R.25	632	63·2	—	—	—
150	P.R.48	257	38·55	—	—	—	—	—	—	P.R.65	632	94·8
200	—	—	—	P.R.24	316	63·2	P.R.26	447	89·4	—	—	—
250	P.R.49	200	50·0	P.R.257	280	70	—	—	—	—	—	—
300	P.R.50	180	54·0	P.R.1	257	77·1	—	—	—	P.R.66	447	134
375	P.R.51	160	60·0	—	—	—	—	—	—	—	—	—
400	—	—	—	—	—	—	P.R.27	316	126·4	—	—	—
500	P.R.52	140	70·0	P.R.2	200	100	—	—	—	—	—	—
600	—	—	—	P.R.3	180	108	P.R.28	258	154	P.R.67	316	189
750	P.R.53	117	87·7	P.R.4	160	120	—	—	—	—	—	—
900	—	—	—	—	—	—	—	—	—	P.R.68	257	231
1·00K.	P.R.54	100	100	P.R.5	140	140	P.R.29	200	200	—	—	—
1·20K.	—	—	—	—	—	—	P.R.30	180	216	—	—	—
1·50K.	P.R.55	81	121·5	P.R.6	117	175	P.R.31	160	240	P.R.69	200	300
1·80K.	—	—	—	—	—	—	—	—	—	P.R.70	180	324
2·00K.	—	—	—	P.R.7	100	200	P.R.32	140	280	—	—	—
2·25K.	—	—	—	—	—	—	—	—	—	P.R.71	160	360
2·50K.	P.R.56	63	157·5	—	—	—	—	—	—	—	—	—
3·00K.	—	—	—	P.R.8	81	243	P.R.33	117	351	P.R.72	140	420
3·75K.	P.R.57	52	195	—	—	—	—	—	—	—	—	—
4·00K.	—	—	—	—	—	—	P.R.34	100	400	—	—	—
4·50K.	—	—	—	—	—	—	—	—	—	P.R.73	117	526
5·00K.	P.R.58	45	225	P.R.9	63	315	—	—	—	—	—	—
6·00K.	—	—	—	—	—	—	P.R.35	81	486	P.R.74	100	600
7·50K.	P.R.59	36	270	P.R.10	51	382	—	—	—	—	—	—
9·00K.	—	—	—	—	—	—	—	—	—	P.R.75	81	729
10·00K.	P.R.60	310	31	P.R.11	45	450	P.R.36	63	630	—	—	—
12·50K.	P.R.61	353	28·3	—	—	—	—	—	—	—	—	—
15·00K.	P.R.62	387	25·8	P.R.12	36	540	P.R.37	50	750	P.R.76	50	750
20·00K.	P.R.63	446	22·3	P.R.13	31	620	P.R.38	37	750	—	—	—
22·50K.	—	—	—	—	—	—	—	—	—	P.R.77	33	750
25·00K.	P.R.64	500	20·0	P.R.14	28	700	—	—	—	—	—	—
30·00K.	—	—	—	P.R.15	25	750	P.R.39	25	750	P.R.78	25	750
40·00K.	—	—	—	P.R.16	19	750	P.R.40	19	750	—	—	—
45·00K.	—	—	—	—	—	—	—	—	—	P.R.79	16·5	750
50·00K.	—	—	—	P.R.17	15	750	P.R.41	15	750	—	—	—
60·00K.	—	—	—	—	—	—	P.R.42	12·5	750	P.R.80	12·5	750
75·00K.	—	—	—	—	—	—	—	—	—	P.R.81	10	750
80·00K.	—	—	—	—	—	—	P.R.43	9·5	750	—	—	—
90·00K.	—	—	—	—	—	—	—	—	—	P.R.82	8·4	750
100·00K.	—	—	—	—	—	—	P.R.44	7·5	750	—	—	—
120·00K.	—	—	—	—	—	—	—	—	—	P.R.83	6·25	750
150·00K.	—	—	—	—	—	—	—	—	—	P.R.84	5	750

To obtain VERTICAL-mounting types please add 'V' to List No. (e.g. P.R.22/V.)

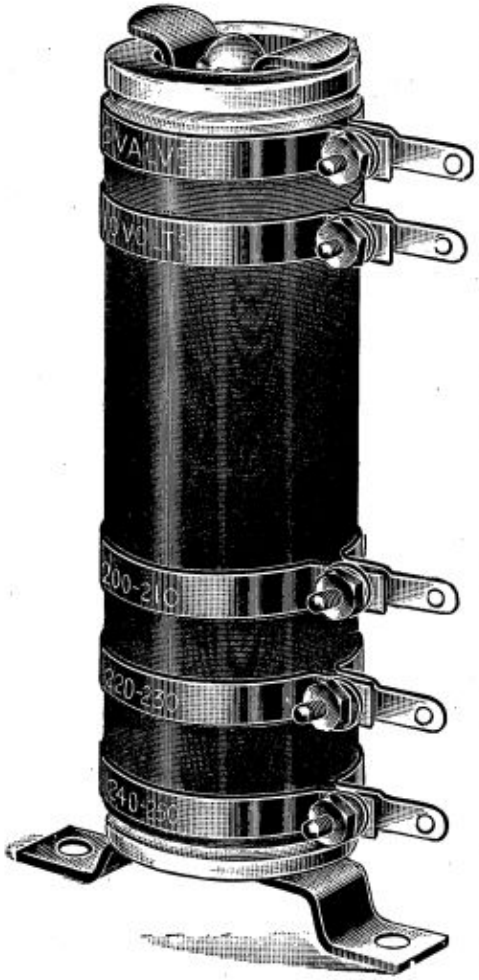
MAINS-DROPPING RESISTORS

FOR UNIVERSAL (A.C.–D.C.) APPARATUS

THESE superior, high-grade dropping resistors are in continuous demand for universal receivers operated from A.C. or D.C. mains. They replace fragile barretters, and their use ensures correct operation of the valve-heaters, giving long life and efficient performance. Being tapped for all usual mains voltages, instant adjustment can be made for supplies at different pressures.

May be housed in the same adequately ventilated cabinet as the remainder of the receiver thus avoiding the dangers which may be inherent in the use of 'line-cord.' Alternatively, in the case of midget receivers, may be used externally when suitably protected. Max. overall dimensions 2" × 5" high. Fixing centres, $1\frac{7}{8}$" approx. ; 2 × 6 B.A. holes.

Solenoidally, single-layer wound on heat-resisting formers with finest, non-corrodible, oxide-insulated resistance wire of 'constant-Ω' characteristics, thereby avoiding the change, upon heating up, of resistance value encountered in the use of inferior types. With clearly marked tapping bands, for lashed-and-soldered or clamped connection. Accuracy of resistance, ± 10%, overall and per section. Anode-feed for H.T. rectification intended to be drawn at mains-voltage, rather from 110 V. or 200 V. tap. Pilot lamp shunts should be separately provided, if required—please see page 44 for suitable small resistors of the usual values of 10–50 Ω.



The connection-bands and solder-tags are heavily SILVER-PLATED, but terminals are also provided, as users sometimes prefer not to use H.M.P. solder, or wish to have their connections quickly adjustable.

MAINS-DROPPING RESISTORS

List No.	Amp.	Volts 'Output' for valve-heater chain at current stated	Ω {Section-wound, as illustrated, the + *sign* indicates an intermediate tap
M.R.26	0·18	90, 100	55+548+110+110
M.R.27	0·18	110, 120	*55+473+110+110
M.R.33	0·20	59, 69	50+190+500+100+100
M.R.34	0·20	72, 82	50+115+500+100+100
M.R.35	0·20	85, 95	50+100+500+100+100
M.R.36	0·20	98, 108	35+ 15+495+100+100
M.R.37	0·20	111, 121	*50+420+100+100
M.R.44	0·3	26	263+334+ 67+ 67
M.R.45	0·3	39	220+334+ 67+ 67
M.R.46	0·3	52	177+334+ 67+ 67
M.R.47	0·3	65	134+334+ 67+ 67
M.R.48	0·3	78	90+334+ 67+ 67
M.R.49	0·3	91	47+334+ 67+ 67
M.R.64	0·3	117	*293+ 67+ 67
M.R.90	0·20	140, 150	*50+225+100+100
M.R.100	0.16	51, 57†	38+300+620+125+125
M.R.101	0·16	63, 69†	38+225+620+125+125
M.R.102	0·16	75, 81†	38+150+620+125+125
M.R.103	0·16	96, 102††	38+ 19+620+125+125
M.R.104	0·16	108, 114††	*38+570+125+125
M.R.105	0·16	120, 126††	*38+490+125+125
M.R.110	0·15	20, 30	66+500+660+135+135
M.R.111	0·15	40, 50	66+370+660+135+135
M.R.112	0·15	60, 70	66+235+660+135+135
M.R.113	0·15	80, 90	66+100+660+135+135
M.R.114	0·15	100, 110	66+635+135+135
M.R.115	0·15	120, 130	*66+500+135+135
M.R.116	0·15	140, 150	*66+370+135+135

* Lacks 100–110 V. tapping, naturally.

† Allows for 1 × U.71 + 1 × KT.72 + further 6 V. valves or bulbs

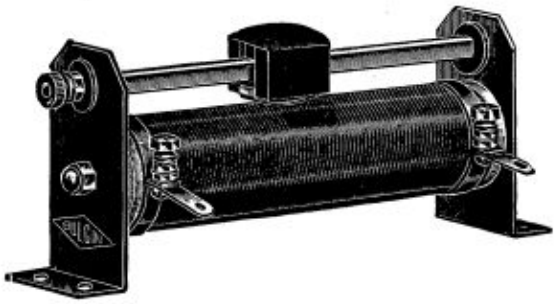
†† Allows for 2 × U.71 + KT.72 + further 6 V. valves or bulbs

} "OSRAM" Types

0·3 A. & 0·15 A. types are popular with U.S.A. A.C.–D.C. valve combinations (M.R. 44–90, M.R. 110–116).

VARIABLE RESISTORS, 60-WATT

(POTENTIOMETERS)



Variable Resistors, List Nos. M.V.1–16

60-W. WIRE-WOUND VARIABLE RESISTORS OR POTENTIOMETERS

THIS useful range of sturdy, heavy-duty potentiometers or variable resistors meets all usual requirements for heavy-loading in radio and light electrical construction, experimental, and test work. Variable contact is smooth and even, and the slider gives continuous contact. There is substantially *no* 'hop-off' - Ω or 'residual'- Ω. The element is linearly wound (tolerance ± 10%) with finest quality oxide-insulated, non-corrodible nickel-alloy wire, on heat resisting former, and has end-terminator clamp-bands. The frame is 'dead,' and may be earthed (Insul. res. ≮ 40M Ω at 500 V═ ; 1 K.V. is the max. test V.). The 10 K Ω and 50 K Ω models have indicator-scale with 0–10 major-, and ½-Unit sub-, calibrations, increasing the usefulness for servicemen, and in laboratories, by giving substitutional experimental determination of unknown Ω-values. Overall Ω-values, ± 10% tolerance. Size :—approx. $1\frac{1}{4}''$ × $5\frac{3}{4}''$ base space, × $2\frac{3}{8}''$ high. Fixing by 4 holes $\frac{1}{8}''$ø at $5\frac{7}{32}''$ × $\frac{3}{4}''$ centres.

IN ORDER OF Ω

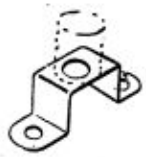
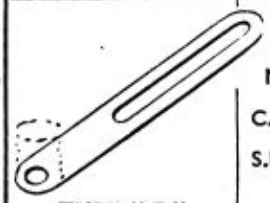
List No.	Ω	Max. at Volt-drop	Max.* current	Other Suggested Uses
M.V.7	6	19	3·16 A.	For chargers, control of models on L.T. supplies, small L.T. motors, etc.
M.V.8	14	29	2·07 A.	
M.V.9	30	42	1·42 A.	
M.V.10	50	55	1·10 A.	
M.V.11	90	74	820 mA.	
M.V.12	150	95	630 mA.	For similar uses at medium voltages
M.V.16	200	118	590 mA.	
M.V.1	250	122	490 mA.	
M.V.2	500	173	346 mA.	For experimental A.C./D.C. circuits with 0·3 A. valves, variable biasing, etc.
M.V.3	750	212	282 mA.	
M.V.4	1·0 K.	245	245 mA.	
M.V.5	1·5 K.	300	200 mA.	
M.V.6	2·0 K.	346	173 mA.	
M.V.13	5·0 K.	550	110 mA.	
M.V.14	10·0 K.	775	77 mA.	For service-work, test-by-substitution, etc.
M.V.15	50·0 K.	1730	34 mA.	

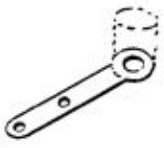
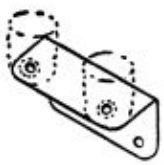
* As the figures in this column represent the max. current through all or part of a resistor winding, they are the *sum* of the steady bleed-current *plus* the current drawn from the slider, in potentiometer connection. If, therefore, appreciable current is drawn from the slider, the max.-voltage-drop figures must be appropriately reduced.

SELECTION OF STOCK BRACKETS & CLIPS FOR ALL M.E.S., M.S.S., M.S.T., M.B.C. (M.C.C.) M.E.S./M., M.B.C./M., C.E.S., S.B.C., S.C.C. TYPES ON THE FOLLOWING PAGES :—

THIS page shows a large selection of stock brackets and clips which are used for the pilot-lamp holders shown in the following pages, and others. They are normally made in steel, Cadmium-plated. Any of these types can be assembled " inverted," having due regard for the size of actual lamp socket with respect to the bracket. The lamp-holder List No. then takes suffix " **/R** " for " **R**eversed."

To order a lampholder that is not shown assembled in the following pages, quote type of socket-shell and bracket required, suffixed by Part No., e.g., " **A** "/**192**. State ' live ' or ' dead,' and any details of materials, finishes, etc., as well as quantity to be manufactured, and we will allocate a " List No." or a drawing number.

Type Bracket	For use with	Part No.
 TYPE " A "	M.B.C., M.E.S., M.S.T.	192
	M.B.C./M . M.E.S./M.	192/1
	C.E.S., S.E.S.	6370
	S.B.C., S.C.C.	192/4
 TYPE " B "	M.B.C., M.E.S., M.S.T.	6369
	M.B.C./M., M E.S./M.	3802/1
	C.E.S., S.E.S.	6369
	S.B.C., S.C.C.	3802/1
	L.E.S. (Smaller dimensions)	8265
 TYPE " D "	M.B.C., M.E.S., M.S.T.	1135
	M.B.C./M., M.E.S./M.	1135/1
	C.E.S., S.E.S.	6366
	S.B.C., S.C.C.	1135/1
 TYPE " E "	M.B.C., M.E.S., M.S.T.	1382
	M.B.C./M., M.E.S./M.	1382/1
	C.E.S., S.E.S.	6364
	S.B.C., S.C.C.	1382/1
 TYPE " G "	M.B.C., M.E.S., M.S.T.	687
	M.B.C./M., M.E.S./M.	687/2
	C.E.S., S.E.S.	6374
	S.B.C., S.C.C.	*

Type Bracket	For use with	Part No.
 TYPE " H "	M.B.C., M.E.S., M.S.T.	174
	M.B.C./M., M.E.S./M.	174/1
	C.E.S., S.E.S.	6372
	S.B.C., S.C.C.	174/1
 TYPE " I "	M.B.C., M.E.S., M.S.T.	5633
	M.B.C./M., M.E.S./M.	5633/1
	C.E.S., S.E.S.	6375
	S.B.C., S.C C.	5633/1
 TYPE " J "	M.B.C., M.E.S., M.S.T.	6613
	M.B.C./M., M.E.S./M.	6613/1
	C.E.S., S.E.S.	6614
	S.B.C., S.C.C.	6613/1
 TYPE " K "	M.B.C., M.E.S., M.S.T.	3950
	M.B.C./M., M.E.S./M.	3950/1
	C.E.S., S.E.S.	6367
	S B.C., S.C.C.	3950/1
	L.E.S. (Smaller dimensions)	8262
 TYPE " L "	M.B.C., M.E.S., M.S.T.	4873
	M.B.C./M., M.E.S./M.	4873/1
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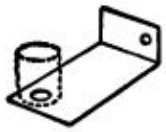
continued—

SELECTION OF STOCK BRACKETS & CLIPS FOR ALL M.E.S., M.S.S., M.S.T., M.B.C. (M.C.C.) M.E.S./M., M.B.C./M., C.E.S., S.E.S., S.B.C., S.C.C., Types on the following pages :—

(*N.B.*—**L.E.S.** pilot lamp holders, see p. 79)

—continued

Type Bracket	For use with	Part No.
 TYPE " N "	M.B.C., M.E.S., M.S.T.	2296
	M.B.C./M., M.E.S./M.	2296/1
	C.E.S., S.E.S.	6373
	—	—
 TYPE " PP "	M.B.C., M.E.S., M.S.T.	5162
	M.B.C./M., M.E.S./M.,	5162/1
	—	—
	—	—
 TYPE " Q "	M.B.C., M.E.S., M.S.T.	133
	M.B.C./M., M.E.S./M.	133/1
	C.E.S., S.E.S.	6371
	—	—
 TYPE " R "	M.B.C., M.E.S., M.S.T.	2877
	M.B.C./M., M.E.S./M.	2877/1
	—	—
	—	—
 TYPE " S "	M.B.C., M.E.S., M.S.T.	1375
	M.B.C./M., M.E.S./M.	1375/–
	—	—
	—	—

Type Bracket	For use with	Part No.
 TYPE " T "	M.B.C., M.E.S., M.S.T.	193
	M.B.C./M., M.E.S./M.	193/1
	C.E.S., S.E.S.	6368
	S.B.C., S.C.C.	193/1
	L.E.S. (smaller dimensions)	8263
 TYPE " U "	M.B.C., M.E.S., M.S.T.	3030
	M.B.C./M., M.E.S./M.	3030/1
	—	—
	—	—
 TYPE " VV "	M.B.C., M.E.S., M.S.T.	686
	M.B.C./M., M.E.S./M.	686/1
	—	—
	—	—
 TYPE " W " (*was* type " M ")	M.B.C., M.E.S., M.S.T.	1426
	M.E.S./M., M.B.C./M.	1426/1
	—	—
	—	—

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

SINGLE-TURN-SCREW M.E.S. PILOT LAMP HOLDERS

THESE pilot-lamp-holders have special single-turn-thread spring-steel vibration-resisting socket, *to accept all M.E.S.-cap lamps to* B.S. 98–E.10*, with this socket acting as one pole. The solder tags are SILVER-plated, and the fixing brackets or clips are Cadmium- or Copper-plated. Insulation is of the highest grade S.R.B.P. or -F. ; moisture-resisting versions, " **T**/ " to be prefixed to List No., can be made to quantity orders.

The illustrations show only a stock few of the types that can be made up to quantity orders ; all the brackets, etc., on pp. 50, 51 can take this socket. Inverted or reversed structures are also often possible—suffix " /**R** " to List No.

All normal structures are with " dead " bracket or clip and two solder-tags, but live-to-shell structures, with one solder-tag only, are made to quantity orders ; suffix " /**L** " to List No.

Rated for 2 A. max., up to 100 V. across poles (lamp fitted, or not). Standard versions : max. text V., 250, ~ ; I.R. ≮ 40 M Ω dry, @ 250 V.=.

We can also supply special versions made with materials and/or finishes to particular Specifications, for exacting uses, by arrangement.

TYPES OF MOUNTING BRACKET OR CLIP (See pp. 50–51)

List No.	Type of Bracket
M.S.T.3	A

List No.	Type of Bracket
M.S.T.94	G

List No.	Type of Bracket
M.S.T.4	B

List No.	Type of Bracket
M.S.T.104	I

List No.	Type of Bracket
M.S.T.15	D

List No.	Type of Bracket
M.S.T.126	J

List No.	Type of Bracket
M.S.T.107	E

List No.	Type of Bracket
M.S.T.64/R was M.S.T.24	N

All " Shells " or sockets can be fitted to various brackets, to quantity orders. A selection of brackets on pp. 50–51.

This is a very popular model, as widely used in U.S.A., and in U.K. The gripping of the Lamp is exceptional, even under adverse vibratory conditions.

* N.B.—B.S.98:1947 Gauges (Figs. 14, 15, ' E.10 ') are not applicable to these Holders. Special gauges, if any, are used.

Versions in special materials/finishes (e.g., ' Tropical ' or specificational) may be manufactured to special quantity orders.

SPRING-SHELL & MOULDED-INSULATION M.E.S. PILOT-LAMP HOLDERS

THESE pilot-lamp holders accept M.E.S.-cap (B.S.98/E.10)* lamps, the phosphor-bronze or **Stainless-steel**-spring helix extending (but not expanding significantly) upon tightening the lamp, to give extra vibration-resisting grip. Solder tags are SILVER-plated, and the fixing brackets or clips are Cadmium-plated. Insulation is of the highest grade S.R.B.P. or -F. They are essentially highly moisture-resisting automatically being **Tropical** without need for the usual added prefix (**T**/-) to designate moisture-resisting variants.

The illustrations show only a stock few of the types that can be made up to quantity orders ; all the brackets, etc., on pp. 50–51 can take this socket. Inverted or reversed structures are also often possible—suffix " **/R** " to List No.

All normal structures are with " dead " bracket or clip, but live-to-shell structures, with one solder-tag only, are made to quantity orders ; suffix " **/L** " to List No.

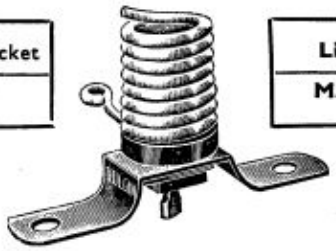
Rated for 2 A. max., up to 100 V. across poles (lamp-fitted, or not) or to earth. Standard versions, max. test V., 250 ~ ; I.R. $\lessgtr$ 40 MΩ dry, @ 500 V.=.

We can also supply special versions made with materials and/or finishes to particular Specifications, for exacting uses, by arrangement. Specificational versions (suffix) " —/D.E.F.5000 ", have stainless-steel coiled " shells ", and can have stainless-steel bracket or clips, if requested.

List No.	Type of Bracket
M.S.S.3	A

List No.	Type of Bracket
M.S.S.94	G

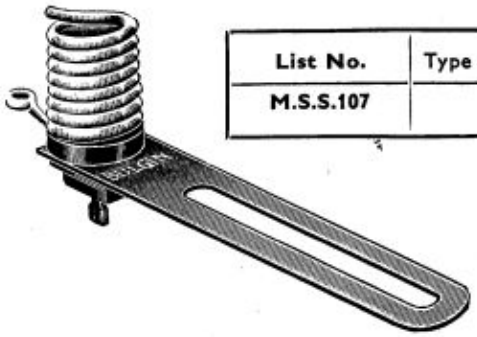
List No.	Type of Bracket
M.S.S.4	B



List No.	Type of Bracket
M.S.S.104	I

List No.	Type of Bracket
M.S.S.15	D

List No.	Type of Bracket
M.S.S.126	J



List No.	Type of Bracket
M.S.S.107	E

List No.	Type of Bracket
M.S.S.64/R (was M.S.S.24)	N

All " Shells " can be fitted to various brackets, to quantity orders. A selection of brackets can be found on pp. 50, 51.

These Lampholders, in the standard (= Tropical) version, or in R.C.S.1000 version, are suitable for the most exacting uses, adversely-climatic and/or adversely-vibrational.

* N.B.—B.S.98:1947 Gauges (Figs. 14, 15, ' E.10 ') are not applicable to these Holders. Special gauges, if any, are used.

PILOT-LAMP HOLDERS, M.E.S.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

M.E.S. MOULDED PILOT-LAMP HOLDERS

AN ENTIRELY NEW range of M.E.S. Pilot-Lamp Holders with all the insulation of moisture-resistant moulding, in one-piece construction. Lamp-acceptance to B.S.98 (E.10 sections). The Lamp-socket ' Shell ' is integral with side-connection tag, moulding-enclosed, and lamp-pip connection is by sprung plunger with integral tag. The spring does not carry any current.

Available with a choice of stock Fixing Brackets or Clips, of which a range is generally shown on pp. 50, 51. The Lamp-Sockets are fitted to clips, or brackets, non-rotatably ; a choice of four angles or positions can be had for quantity orders. All parts non-ferrous, and heavily SILVER-plated, except clips or brackets. These are suitably plated. Particular materials and finishes specs. can be applied, to order.

Lamp Acceptance, B.S.98:E.10 for all M.E.S./M. types Max. A., 5. Max. wkg.-V., 100 (or higher, if via series-Ω, as for Neon-lamps). Max. proof test-V., 500 V. ~ or 250 V. = I.R. test for ≮ 100MΩ dry or after recovery from moisture. ' Live ' (to fixing bracket) models **are *not*** made.

TYPES OF MOUNTING BRACKET OR CLIP (See pp. 50–51)

List No.	Type of Bracket
M.E.S./M.3	A

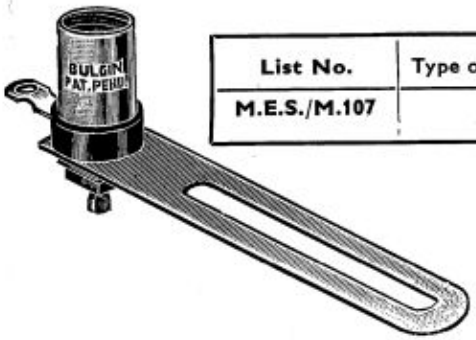
List No.	Type of Bracket
M.E.S./M.94	G

List No.	Type of Bracket
M.E.S./M.4	B

List No.	Type of Bracket
M.E.S./M.104	I

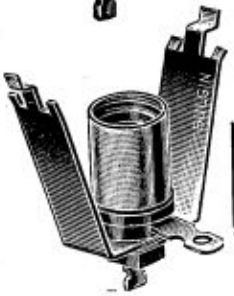
List No.	Type of Bracket
M.E.S./M.15	D

List No.	Type of Bracket
M.E.S./M.126	J



List No.	Type of Bracket
M.E.S./M.107	E

List No.	Type of Bracket
M.E.S./M.64/R was M.E.S./M.24	N



List No.	Type of Bracket
M.E.S./M.102	U

All ' Shells ' can be fitted to various brackets, to quantity orders. A selection of brackets can be found on pp. 50–51.

All these Standard Versions are highly ' Tropical ' (climatic-resisting) without need for a separate (" **T/—** ") version ; but Specificational Versions, e.g., "**—/R.C.S. 1000** " can be supplied to agreed orders.

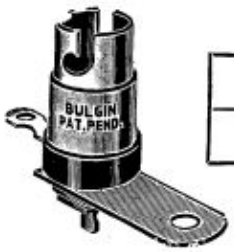
Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

M.B.C. (M.C.C.) MOULDED PILOT LAMP HOLDERS

AN ENTIRELY NEW range of M.B.C. Pilot-Lamp Holders with all the insulation of moisture-resistant moulding, in one-piece construction. Lamp-acceptance to B.S.52 (B.A.9s sections). The Lamp-socket ' Shell ' is integral with side-connection tag, moulding-enclosed, and lamp-pip connection is by sprung plunger with integral tag. The spring does not carry any current.

Available with a choice of stock Fixing Brackets or Clips, of which a range is shown on pp. 50, 51. The Lamp-Sockets are fitted to clips, or brackets, non-rotatably ; a choice of four angles or positions can be had for quantity orders. All parts non-ferrous, and heavily SILVER-plated, except clips or brackets. These are suitably plated. Particular materials and finishes specs. can be applied, to order.

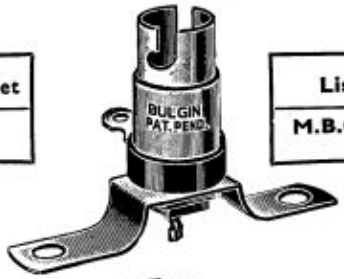
Lamp Acceptance, B.S.52 : B.A.9s. for all M.B.C.(M.C.C.) types. Max. A., 5. Max. wkg.-V., 100 (or higher, if via series Ω, as for Neon-lamps). Max. proof test-V. 500 V.~ ; I.R. taken @ 250 V. ⎓, for ≮ 100 MΩ dry or after recovery from moisture. ' Live ' (to fixing bracket) models are *not* made.



List No.	Type of Bracket
M.B.C./M.3	A

List No.	Type of Bracket
M.B.C./M.94	G

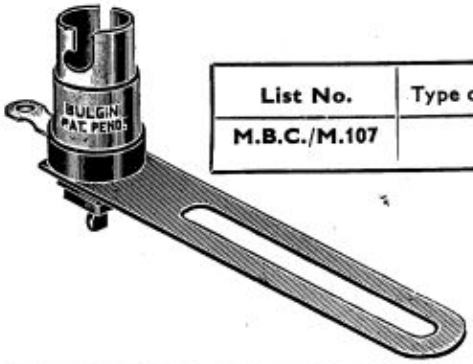
List No.	Type of Bracket
M.B.C./M.4	B



List No.	Type of Bracket
M.B.C./M.104	I

List No.	Type of Bracket
M.B.C./M.15	D

List No.	Type of Bracket
M.B.C./M.126	J



List No.	Type of Bracket
M.B.C./M.107	E

List No.	Type of Bracket
M.B.C./M.64/R was M.B.C./M.24	N

All " Shells " can be fitted to various brackets, to quantity orders. A selection of brackets can be found on pp. 50–51.

All these Standard Versions are highly ' Tropical ' (climatic-resisting) without need for a separate (" **T/—** ") version ; but Specificational Versions, e.g., " **—/R.C.S.1000** " can be supplied to agreed orders.

List No.	Type of Bracket
M.B.C./M.102	U

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

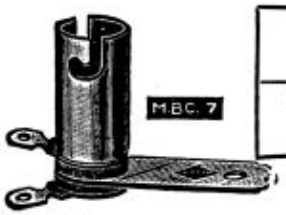
M.B.C. PILOT LAMP HOLDERS (M.C.C.)

THESE pilot lamp holders conform accurately to " B.9s " of B.S.52 for miniature-bayonet-cap (M.B.C.) or miniature-centre-contact (M.C.C.) lamps. M.B.C. is becoming a very popular type. The " shell " or socket is one of the poles, and the centre contact is **standard** with sprung plunger pin, but a *further* alternative centre-contact is available with a moulded platform contact, ref. **B.P.11.** The spring does not carry current, and the wire or cable is soldered into the depressible platform, so that no second soldering tag is then provided. See drawings below.

Normal assemblies are with the brackets or clips *NOT* " live " but any assembly can be made, in quantity, with the *shell* in contact with the bracket, strip, or clip ; add " **/LIVE** " to List No ; the shell-tag is then omitted. Some brackets and clips, obviously invertible may be had (also to quantity orders) reversed : add " **/R** " to List No. For the platform-contact feature add " **/B.P.11** " to List No.

Standard ratings : I.R. = ≮ 40MΩ@ 500 V. = (= max. test V.). Use @ 0·1—50 V. across poles (≯250 V. with series resistor) ; max. Amp. 1. B.P. 11 type allows max. Amp.= 5 and higher I.R. under damp climatic conditions.

We can also supply special versions made with materials and/or finishes to particular Specifications, for exacting uses, by arrangement.



A

List No.	Bracket Type
M.B.C. 7	A

B

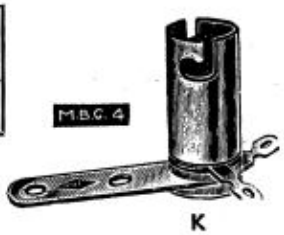
List No.	Bracket Type
M.B.C. 5	B

List No.	Bracket Type
M.B.C. 6	I

M.B.C. 18/R/L (was M.B.C.9)

G

List No.	Bracket Type
M.B.C. 18/R/L was M.B.C.9	G



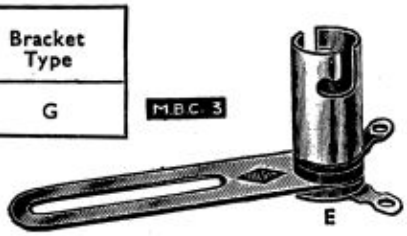
K

List No.	Bracket Type
M.B.C. 4	K

M.B.C. 18/R/ (was M.B.C.28)

G

List No.	Bracket Type
M.B.C. 18/R/ was M.B.C. 28	G

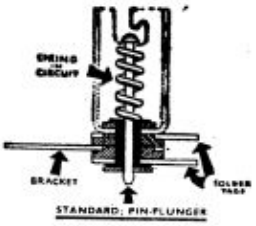


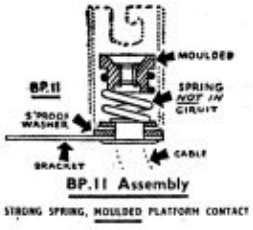
E

List No.	Bracket Type
M.B.C. 3	E

OTHER TYPES OF MOUNTING BRACKET OR CLIP SEE PP. 50–51.

M.B.C. (M.C.C.) Lamp holders can be fitted with various brackets. to quantity orders. Selection of brackets on pp. 50–51





BP.11 Assembly

STRONG SPRING, MOULDED PLATFORM CONTACT

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

M.B.C. PILOT LAMP HOLDERS (M.C.C.)

THESE pilot lamp holders conform accurately to " B.9s " of B.S.52 for miniature-bayonet-cap (M.B.C.) or miniature-centre-contact (M.C.C.) lamps. M.B.C. is becoming a very popular type. The " shell " or socket is one of the poles, and the centre contact is **standard** with sprung plunger pin, but a *further* alternative centre-contact is available with a moulded platform contact, ref. **B.P.11**. The spring does not carry current, and the wire or cable is soldered into the depressible platform, so that no second soldering tag is then provided. See drawings below.

Normal assemblies are with the brackets or clips *NOT* " live " but any assembly can be made, in quantity, with the *shell* in contact with the bracket, strip, or clip ; add " **/LIVE** " to List No. ; the shell-tag is then omitted. Some brackets and clips, obviously invertible, may be had (also to quantity orders) reversed : add " **/R** " to List No. For the platform-contact feature add " **/B.P.11** " to List No.

Standard ratings : I.R. = ≮ 40MΩ @ 500 V. = (= max. test V.). Use @ 0·1—50 V. across poles (≯ 250 V. with series resistor) ; max. Amp. 1. B.P. 11 type allows max. Amp. = 5 ; and higher I.R. under damp climatic conditions.

We can also supply special versions made with materials and/or finishes to particular Specifications, for exacting uses, by arrangement.

TYPES OF MOUNTING BRACKET OR CLIP (see pp. 50–51)

U

List No.	Type Bracket
M.B.C. 102	U

List No.	Type Bracket
M.B.C. 8	No Bracket

D

List No.	Type Bracket
M.B.C. 13	D

H

List No.	Type Bracket
M.B.C. 12	H

N

List No.	Type Bracket
M.B.C. 10	N

M.B.C. 10/L (was M.B.C.11)

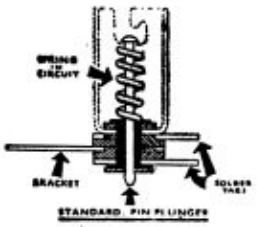
N

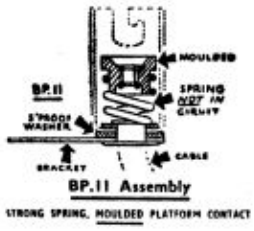
List No.	Type Bracket
M.B.C.10/L (formerly M.B.C.11)	N

Q

List No.	Type Bracket
M.B.C. 14	Q

M.B.C. (M.C.C.) Lamp holders can be fitted with various brackets, to quantity orders. Selection of brackets on pp. 50–51





Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

SPRING-SHELL M.E.S. PILOT LAMP HOLDERS

THESE pilot lamp holders accept M.E.S.-cap (B.S.98/E.10) lamps, the plated *steel*-spring helix extending (but not expanding significantly) upon tightening the lamp, to give extra-vibration-resisting grip. Solder tags are SILVER-plated, and the fixing brackets or clips are Cadmium- or Copper-plated. Insulation is of the highest grade S.R.B.P. or -F. ; moisture-resisting versions, "**T**/" to be prefixed to List No., can be made to quantity orders. The illustrations show only a stock few of the types that can be made up to quantity orders ; all the brackets, etc., on pp. 50–51 can take this socket. Inverted or reversed structures are also often possible—suffix "/**R**" to List No. All normal structures are with "dead" bracket or clip, but live-to-shell structures, with one solder-tag only, are made to quantity orders ; suffix "/**L**" to List No.

Rated for 2 A. max., up to 100 V. use. Standard versions, max. test V., 250 ~ ; I.R. ≮ 40MΩ dry @ 250 V =.

We can also supply special versions made with materials and/or finishes to particular Specifications, for exacting uses, by arrangement. "Tropical" (add T:—to List No.) or (suffix :—) "—/D.E.F. 5000" versions have stainless-steel coiled "shells," can have stainless-steel bracket or clips, as a "special."

TYPES OF MOUNTING BRACKET OR CLIP (See pp. 50–51)

List No.	Type of Bracket
M.E.S. 59	A

List No.	Type of Bracket
M.E.S. 55	H

List No.	Type of Bracket
M.E.S. 62	Q

List No.	Type of Bracket
M.E.S. 58	B

List No.	Type of Bracket
M.E.S. 63	I

List No.	Type of Bracket
M.E.S. 98	T

M.E.S. 80/R was M.E.S. 89

List No.	Type of Bracket
M.E.S. 80/R was M.E.S. 89	G

List No.	Type of Bracket
M.E.S. 53	K

List No.	Type of Bracket
M.E.S. 103	U

List No.	Type of Bracket
M.E.S. 36	E

List No.	Type of Bracket
M.E.S. 54	N

List No.	Type of Bracket
M.E.S. 56	No Bracket

All "Shells" can be fitted to any brackets, to quantity orders. A selection of brackets can be found on pp. 50–51

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

ROLLED SHELL M.E.S. PILOT LAMP HOLDERS

THESE pilot lamp holders conform to B.S.98, section E.10, " M.E.S." with the socket or shell acting as one pole. Fitted with resilient centre-contact leaf ; the solder tags are SILVER-plated, and the fixing brackets or clips are Cadmium- or Copper-plated. Insulation is of the highest grade S.R.B.P. or -F. ; moisture-resisting versions, " **T/** " to be prefixed to List No., can be made to quantity orders.

The illustrations show only a stock few of the types that can be made up to quantity orders : all the brackets, etc., on pp. 50–51 can take this socket. Inverted or reversed structures are also often possible—suffix " **/R** " to List No.

All normal structures are with " dead " bracket or clip and two solder-tags ; but live-to-shell structures, with one solder-tag only, are made to quantity orders ; suffix " **/L** " to List No.

Rated for 2A. max., up to 100 V. use. Standard versions : max. test V. 250 ~ ; I.R. ≮ 40 M Ω dry, @ 500 V. =.

We can also supply special versions made with materials and/or finishes to particular Specifications, for exacting uses, by arrangement. For TROPICAL Versions, add prefix : " T/— " to List No. For spec. versions, add suffix of spec. (e.g.) " —/D.E.F.5000."

List No.	B'k't Type
M.E.S. 3	A

List No.	B'k't Type
M.E.S. 26	D

M.E.S.64/R was M.E.S.24

List No.	B'k't Type
M.E.S. 64/R was M.E.S. 24	N

List No.	B'k't Type
M.E.S. 4	B

(Spring-loaded plunger version of M.E.S. 15 ; applicable to other types on request).

List No.	B'k't Type
M.E.S. 94/R	G

List No.	B'k't Type
M.E.S. 19	S

M.E.S.15/R was M.E.S.10

List No.	B'k't Type
M.E.S. 15/R was M.E.S.10	D

M.E.S.104/R/L was M.E.S.29

List No.	B'k't Type
M.E.S. 104/R/L was M.E.S. 29	

List No.	B'k't Type
M.E.S. 6	T

List No.	B'k't Type
M.E.S. 15	D

List No.	B'k't Type
M.E.S. 14	K

List No.	B'k't Type
M.E.S. 18 Fitted with rubber grommet	No Bracket

Also, not illustrated :—

B'k't Type	E	G	H	J	L	P	Q	U	W
List No.	M.E.S. 107	M.E.S. 94/R	M.E.S. 88	M.E.S. 126	M.E.S. 100	M.E.S. 109	M.E.S. 21	M.E.S. 102	M.E.S. 16

All " Shells " can be fitted to any brackets, to quantity orders. A selection of brackets can be found on pages 50–51

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

LAMP HOLDERS WITH SMALL CANDELABRA " E.12 " SCREW SOCKETS (U.S.A. and CANADIAN STANDARD)

THESE new pilot-lamp holders accept lamps with small-candelabra cap (Canadian C.S.A. Spec. C.22.2 No. 43/49 ; U.S.A. Spec. A.S.A. C.44/31 (E.12) ; see pp. 83–85 for recommended lamps) which is standardised in Canada and U.S.A. and some other countries following their standards. The Socket size is intermediate between M.E.S. (E.10 of B.S.98) and S.E.S. (E.14 of B.S.98). Fitted with resilient centre-contact, accurately rolled-thread " shell," and solder-tags for connection, all heavily Ag.-plated. Insulation of highest grade S.R.B.P. or -F. Moisture-resisting versions, " **T**/ " to be prefixed to List No., can be made to quantity orders. **We can also supply special versions made with materials and/or finishes to particular Specifications, for exacting uses, by arrangement.** The illustrations show only a few stock types. This socket size can be made up, to quantity orders, upon most of the familiar stock "BULGIN" pilot-lamp Brackets or Clips. All standard models have two tags, bracket or clip " dead " from poles. Models with shell live to bracket (and single tag) can be made to quantity order ; add " **/L** " to List No. Also, models differing by inversion of bracket or clip can be supplied to quantity order ; add " **/R** " to List No.

Elec. Ratings (standard versions) : **(Working)** 2 A. Max., 150 V. Max. across poles (or 250 V., if via series-Ω) ; 500 V. Max. to E. **(A.C. Proof-Test)** 500 V. across poles, 1 KV. to E. ; dry I.R. at 500 V. = ⩽ 50 MΩ, dry.

TYPES OF MOUNTING-BRACKET OR CLIP (pp 50–51)

Order by List No.	Tags and Fixing
C.E.S. 22/P.C.	2 × short tags for thru-soldering to P.C.

Order by List No.	Bracket Coding
C.E.S. 3	A

Order by List No.	Bracket Coding
C.E.S. 4	B

Order by List No.	Bracket Coding
C.E.S. 15	D

Order by List No.	Bracket Coding
C.E.S. 107	E

Order by List No.	Bracket Coding
C.E.S. 94	G

Order by List No.	Bracket Coding
C.E.S. 88	H

Order by List No.	Bracket Coding
C.E.S. 104	I

Order by List No.	Bracket Coding
C.E.S. 126	J

All ' Shells " can be fitted with various brackets to quantity orders. A selection of brackets is shown on pp. 50–51.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(SMALL EDISON SCREW TO B.S.98:1947, ' E.14 ')

ROLLED THREAD S.E.S. PILOT LAMP HOLDERS

THESE pilot-lamp-holders conform to Section E.14 ("S.E.S." or Small Edison Screw) of B.S.98, with the socket or screwed shell acting as one pole. Fitted with resilient centre-contact-leaf, and solder-tags SILVER-plated for ease of connection. Fixing brackets or springy clips are Cadmium- or Copper-plated against corrosion. Insulation is of high-grade S.R.B.P. or -F. **We can also supply special versions made with materials and/or finishes to particular Specifications, for exacting uses, by arrangement.** These illustrations show only a selection; almost all the brackets, etc., on pp. 50, 51 can take S.E.S. fitting, for special orders. Inverted or reversed structures (suffix "/**R**" to List No.) are also often possible. All normal structures are with "dead" bracket or clip and two solder-tags, but live-to-shell assemblies (add suffix "/**L**") are made to order, with one tag only.

Ratings: 2 A. max., 250 V. max., but 40 W. max. Standard versions test @: Max. 500 V., I.R. ≮ 40 M Ω dry or recovered, @ 500 V =. (*N.B.* Under 1957 amendment to B.S. 98, 'E.14' (S.E.S.) holders may only be used above 130 V., up to 150 V., if an insulant shroud is fitted to cover the socket, *and the inserted lamp cap when mated**) Specificational versions (e.g., List No. S.E.S. xxx/R.C.S.1000) *may have higher voltages for* **Test** *only.*

(*Not normally supplied by BULGIN, but suppliable to quantity order by arrangement.)

By amendment 6 to B.S.98 (16/4/1957):—The E.14 lamp-cap and -holder may be used for -- up to 250V. provided the -holder is so placed and safeguarded that neither the -cap nor the screw part of the holder can be touched when -- fully engaged --. [When 'live', of course.]

TYPES OF MOUNTING BRACKET OR CLIP (See pp. 50–51)


S.E.S.8


S.E.S. 10

List No.	Type of Bracket
S.E.S. 8	No Bracket


S.E.S. 10/L

List No.	Type of Bracket
S.E.S. 10	N


S.E.S. 39

List No.	Type of Bracket
S.E.S. 10/L	N


S.E.S. 12

List No.	Type of Bracket
S.E.S. 39	D


S.E.S. 46

List No.	Type of Bracket
S.E.S. 12	H

List No.	Type of Bracket
S.E.S. 46	G


S.E.S. 31

List No.	Type of Bracket
S.E.S. 31	B


S.E.S. 6

List No.	Type of Bracket
S.E.S. 6	I


S.E.S. 40

List No.	Type of Bracket
S.E.S. 40	A


S.E.S. 41

List No.	Type of Bracket
S.E.S. 41	K


S.E.S. 3

List No.	Type of Bracket
S.E.S. 3	E

List No.	Type of Bracket
S.E.S. 126 NOT ILLUSTRATED	J

All " Shells " can be fitted with various brackets, to quantity orders. A selection of brackets is shown on pp. 50–51

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(SINGLE- OR DOUBLE-CONTACT, ' B.15 ' OF B.S.52)
SMALL BAYONET-CAP HOLDERS, SINGLE AND DOUBLE CONTACT

THIS new range of small-bayonet-cap lampholders or pilot-lampholders accepts lamps to B.S.52/B.15-sizes.

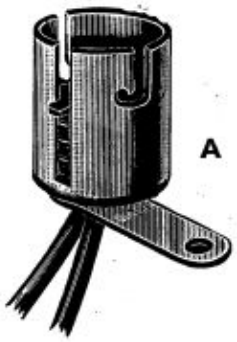
The pip contact(s) is/are carried upon a moulded bakelite type platform, fully sprung ; the spring does not carry current. Connections are made by bringing the insulated cables through the adequate base hole and soldering to the hollow pip-contact(s) of the platform.

The fixing bracket is in every case in contact with the socket ' Shell ' or cup ; in the double-contact models it may be earthed independently, but in the single-contact models it forms one pole of lamp-connection, and only a single cable is taken to the platform.

Standard commercial versions have non-ferrous ' Shell,' SILVER-plated, with steel spring copper-plated, and bracket or clip, cadmium-plated.

We can also supply special versions made with materials and/or finishes to particular Specifications for exacting uses, by arrangement.

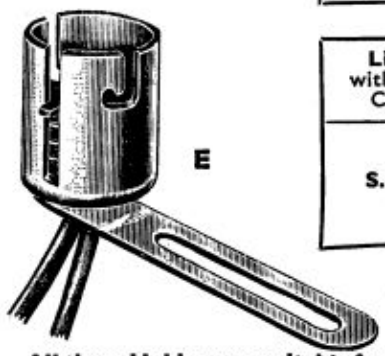
Standard Versions, Electrical Ratings : 250 V. max., wkg., 1 KV.~ proof-test ; I.R.: @ 500 V. =, for ≮ 100 MΩ (dry, or after any moisture recovery). (All these tests ignore cable(s).) Max. current, 2 A. for double-contact types, 4 A. for single-contact types.



A

B

D



E

TYPES OF MOUNTING BRACKET OR CLIP (see pp. 50–51)

List No. with Double-Contacts	List No. with Single-Contacts	Code Letter of Bracket Type	Lamps suitable, recommended on pp. 83–85
S.B.C.3	S.C.C.3	A	(S.B.C.-Cap) 3, 13, 26
			(S.C.C.-Cap) 13

List No. with Double-Contacts	List No. with Single-Contacts	Code Letter of Bracket Type	Lamps suitable, recommended on pp. 83–85
S.B.C.4	S.C.C.4	B	(S.B.C.-Cap) 3, 13, 26
			(S.C.C.-Cap) 13

List No. with Double-Contacts	List No. with Single-Contacts	Code Letter of Bracket Type	Lamps suitable, recommended on pp. 83–85
S.B.C.15	S.C.C.15	D	(S.B.C.-Cap) 3, 13, 26
			(S.C.C.-Cap) 13

List No. with Double-Contacts	List No. with Single-Contacts	Code Letter of Bracket Type	Lamps suitable, recommended on pp. 83–85
S.B.C.107	S.C.C.107	E	(S.B.C.-Cap) 3, 13, 26
			(S.C.C.-Cap) 13

[Further types on opposite page . . .

All these Holders are suitable for Automobile Lamps ; S.B.C. types may be used for 250 V. max., also.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(SINGLE- OR DOUBLE-CONTACT, 'B.15' OF B.S.52)
SMALL BAYONET-CAP HOLDERS, SINGLE AND DOUBLE CONTACT

THIS new range of small-bayonet-cap lampholders or pilot-lampholders accepts lamps to B.S.52, B.15s & B.15d-sizes. The pip contact(s) is/are carried upon a moulded bakelite type platform, fully sprung ; the spring does not carry current. Connections are made by bringing the insulated cables through the adequate base hole and soldering to the hollow pip-contact(s) of the platform.

The fixing bracket is in every case in contact with the socket ' Shell ' or cup ; in the double-contact models it may be earthed independently, but in the single-contact models it forms one pole of lamp-connection, and only a single cable is taken to the platform.

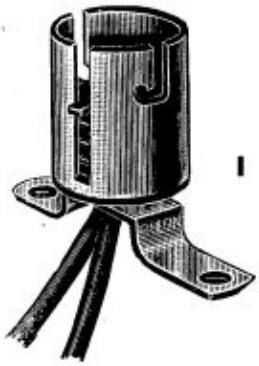
Standard commercial versions have non-ferrous ' Shell,' SILVER-plated, with steel spring copper-plated, and bracket or clip, cadmium-plated.

We can also supply special versions made with materials and/or finishes to particular Specifications for exacting uses, by arrangement.

Standard Versions, Electrical Ratings : 250 V. max. wkg., 1 KV. ~ proof-test: I.R. : @ 500 V. =, for ≮ 100 MΩ (dry, or after any moisture recovery). (All these tests ignore cable(s).) Max. current, 2 A. for double-contact types, 4 A. for single-contact types.

G

H



I

J

TYPES OF MOUNTING BRACKET OR CLIP (see pp. 50–51)

List No. with Double-Contacts	List No. with Single-Contacts	Code Letter of Bracket Type	Lamps suitable, recommended on pp. 83–85
S.B.C.94	S.C.C.94	G	(S.B.C.-Cap) 3, 13, 26
			(S.C.C.-Cap) 13

List No. with Double-Contacts	List No. with Single-Contacts	Code Letter of Bracket Type	Lamps suitable, recommended on pp. 83–85
S.B.C.88	S.C.C.88	H	(S.B.C.-Cap) 3, 13, 26
			(S.C.C.-Cap) 13

List No. with Double-Contacts	List No. with Single-Contacts	Code Letter of Bracket Type	Lamps suitable, recommended on pp. 83–85
S.B.C.104	S.C.C.104	I	(S.B.C.-Cap) 3, 13, 26
			(S.C.C.-Cap) 13

List No. with Double-Contacts	List No. with Single-Contacts	Code Letter of Bracket Type	Lamps suitable, recommended on pp. 83–85
S.B.C.126	S.C.C.126	J	(S.B.C.-Cap) 3, 13, 26
			(S.C.C.-Cap) 13

All these Holders are suitable for Automobile Lamps ; S.B.C. types may be used for 250 V. max., also.

PILOT LAMP HOLDERS

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders

(SHROUDED)

All-Insulated for series-chain, Pilot, Bulb-fuse, etc.

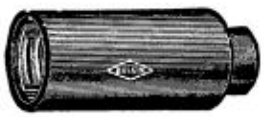
ALL INSULATED LAMP-HOLDERS, M.E.S. & M.B.C. SIZES

THESE lampholders are all-insulated shrouded types as illustrated, covering a wide variety of uses. They are accurate for lamp-acceptance to **B.S.98/E.10 (M.E.S.)** and **B.S.52/Addendum** (M.B.C., also known as M.C.C., miniature-centre-contact) **B.A.9s.** The normal colour is BLACK.

Other colours only supplied to quantity order. The List No. F.5 model is widely used with fuse-lamps; all models are used for pilot-lamps (behind tuning dials or the lens-bezels of pages 83–85). **M.B.C.** and **M.E.S.120, 121** are used for series-chain wiring and **D.630–630/M.B.C.** are special lock-in pilot holders.

The M.B.C. types have flex-accepting plunger, the spring not carrying any current. Use (*all models*) 0·1–50 V. (250 V., series circuits), 2 A. max. 500 V. max. working-V. to E., 500 V. max. test V. across poles (< 40 M Ω dry I.R.). F.5 made in bakelite; the other models are in thermo-plastic, except to quantity-inquiries.

List No. F.5



List No. M.E.S.120

List No. M.E.S.121

List No. D.630

List No. D.630/M.B.C.

List No.		Fixing Provision	Overall Size (without bulb)	Notes on uses	Connections
M.E.S.	M.B.C.				
F.5	—	Two 4 B.A. clearing holes @ $\frac{11}{16}$" crs.	$\frac{3}{4}$" × $1\frac{1}{16}$" × $1\frac{1}{8}$"	Fuse-bulb holder. Pilot-lamp holder. (Raise from chassis at < 250 V. to E.)	6 B.A. terminals

List Nos.		Fixing Provision	Overall Size (without bulb)	Notes on uses	Connections
M.E.S.	M.B.C.				
M.E.S. 120	M.B.C. 120*	Normally hung in run of wiring	$\frac{11}{16}$" × $\frac{13}{32}$" Ø	Pilot-lamps-holders in all types of apparatus; series-chain plurality use	Solder to flex-wires

List Nos.		Fixing Provision	Overall Size (without bulb)	Notes on uses	Connections
M.E.S.	M.B.C.				
M.E.S. 121	M.B.C. 121*	Normally hung in run of wiring but may be wedged back in $\frac{1}{2}$"Ø hole	$1\frac{1}{32}$" × $\frac{15}{16}$"Ø	Pilot-lamp-holders in all types of apparatus; series-chain plurality use	Solder to flex-wires

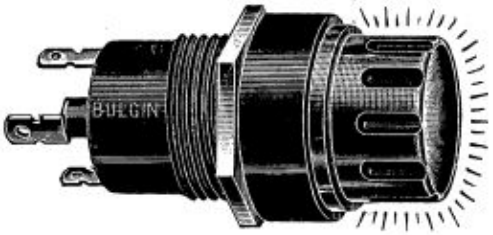
List Nos.		Fixing Provision	Overall Size (without bulb)	Notes on uses	Connections
M.E.S.	M.B.C.				
D.630	D.630 /M.B.C.	To chassis of 18 S.W.G. min., $\frac{3}{32}$" max. (*a*) Press down a slot of $\frac{17}{32}$" width (*b*) Pierce two holes $\frac{3}{16}$"Ø at $\frac{33}{64}$" crs., and superimpose central $\frac{17}{32}$"Ø hole; push-in and turn through 90°.-max. lamp-Ø then ·511" (13 mm.) (*c*) Press back into $\frac{1}{2}$"Ø hole	$1\frac{1}{8}$" × $\frac{15}{16}$"Ø	Rear-disengaging pilot-lamp holders	Solder to flex-wires

* M.B.C. Types, made to Quantity orders only. Not illustrated; same external appearance and size.

SPECIAL-DUTY SIGNAL LAMPS

Special extra-tropical versions supplied to order—see text *

THESE Special Signal Lamps have all-moulded bakelite bodies and insulation throughout. No S.R.B.P. or F. is used Internal Sockets are: M.E.S. (B.S.98/E.10); S.E.S. (B.S.98/E.14); and M.B.C. (M.C.C.) to B.S.52/Ba.9s. Rear soldering tags for connections include a third and *isolated* tag as a junction or 'jumper' point (which can be used with a series-resistor). All metal parts are non-ferrous, heavily SILVER-plated. The special Lens-caps are moulded, in transparent polystyrene, to a range of colours, as shown below. All the three models have identical fixing-hole, panel-thickness acceptance, and front-of-panel appearance; the M.B.C. model has slightly greater rear-of-panel depth. All models have anti-rotation-"key," and take a slotted-edge panel hole.



M.E.S. & S.E.S. MODELS

Lens-caps are transparent only, and only in 'Styron' for wkg. @ 60°C. max. Please state COLOUR required. When ordering—RED, GREEN, BLUE, AMBER or WATER-CLEAR. (e.g.—**D.681/BLUE**)

M.B.C. (M.C.C.) MODEL

***Special Versions of these Signal Lamps, made with materials and finishes to Specification D.E.F.-5000 and conforming to R.C.L.201(prov.) are MADE TO ORDER in quantities, for exacting uses. Installation drgs. will be furnished upon request. Cite:—D."680/R.C.L.201" *or* "D.681/M.B.C./R.C.L.201" *or* "D.681/R.C.L.201". D.682/Colour/R.C.L.201.**

M.E.S. MODEL: Suitable for max. 13-15 mm.Ø bulbs, *see* pp. 83–85 recommendations (types 1, 5, 7). Tested for: (*a*) 250 V. max. wkg. across tags, (*b*) 1 KV. max. wkg. to panel (= E.). Proof test = (*a*) 500 V., (*b*) 2 KV. for 1 minute. (All 50~).

S.E.S. MODEL: Suitable for S.E.S.-cap neon, *see* pp. 83–85, type 12. (Interservice:—X. 962106). Tested for (*a*) 250 V. max. wkg. across tags, (*b*) 1 KV. max. wkg. to panel (= E.). Proof test = (*a*) 500 V., (*b*) 2 KV., for 1 minute. (All 50~).

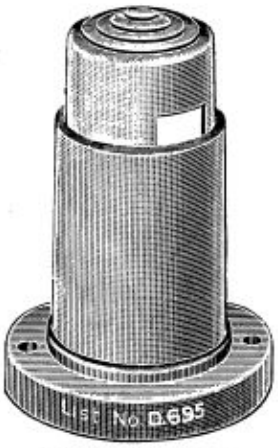
List No.	Internal Socket to B.S./98	Over-all dims.	Panel hole	Max. Panel thick-ness	Front Projec-tion	Rear Projec-tion (Max. panel)
D.680 /Colour D.681 /Colour	'S.E.S.', E.14 'M.E.S.', E.10	1 1/16" Ø (27 mm.) × 2 5/16" (58 mm.) long	0·880" Ø (22·3 mm.) + key-slot ·098" × ·050" deep	13/32" (10·3 mm.)	57/64" (22·6 mm.)	1" (25·4 mm.)

M.B.C. (M.C.C.) MODEL: Suitable for M.B.C.-cap neon or filament lamps, "balloon" up to 15 mm.Ø, *see* pp. 81-83, types 2, 6, 8, 10, 11. (D.682/Colour, accepts lamp No. 19, page 82). Tested for (*a*) 250 V. max. wkg. across tags, (*b*) 1 KV. max. wkg. to Panel (= E.). Proof test = (*a*) 500 V., (*b*) 2 KV., for 1 minute. (All 50~).

List No.	Internal Socket to B.S./52	Over-all dims.	Panel hole	Max. Panel thick-ness	Front projec-tion	Rear Projec-tion (Max. panel)
D.681 /MBC	M.B.C. (M.C.C.) = BA.9s	1 1/16" Ø (27 mm.) 2 7/16" (62 mm.)	0·880" Ø (22·3 mm.) + key-slot ·098" × ·050" deep	13/32" (10·3 mm.)	57/64" (22·6 mm.)	1 1/8" (28·6 mm.)
D.682 /Colour	M.E.S. (E.10)					

PILLAR-SIGNAL-LAMPS

FOR BASEBOARD MOUNTING AND PANELS, INSTRUMENT-BOARDS, ETC.



List No. D.695/Colour

MANUFACTURED with tubular apertured cover and matching bakelite moulded base and fitted with B.S.98/E.10 Socket, rolled-thread M.E.S. shell with silver-plated solder-tags concealed in the base. A 30° port gives adequate illumination for baseboards, panels, instrument-boards. (*map reading light, dial-illumination*, etc.). Fixing is provided for by two 0·116" dia. holes (6 *B.A. Clear*) at 1¼" centres; provide a single centre hole for cables.

A SECOND fitting has same body colours and dimensions as the above model, but is fitted with an added brilliant transparent lens at the top, enabling the fitting also to give colour-signal as well as side illumination. Lens are available in the usual range—red, green, blue, amber and water-clear.

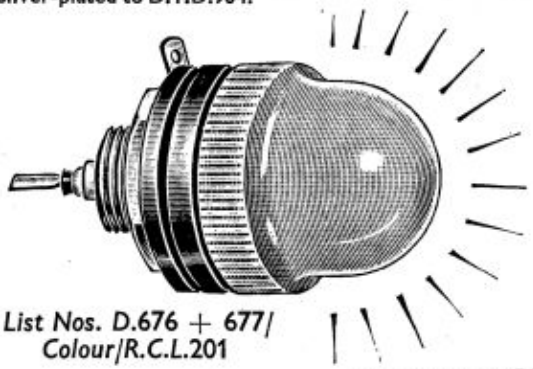
Order by List No.	Type and Description	Body Colour	Top-Lens Colours
D.695/Body-colour (state)	Upright Pillar Lamp fitting, plain top	WHITE	NO TOP LENS TO THIS MODEL
		BROWN	
D.696/Body-colour (state) /Lens-colour (state)	do., with TOP LENS	WHITE	Red *or* Yellow *or* Green *or* Blue *or* Water-clear
		BROWN	
FIXING:—Two 0·116"Ø holes (6 B.A. clear) @ 1¼" crs. Solder-tags in base for connexions.			

SIGNAL LAMPS TO D.E.F.5000 & R.C.L.201 (PROV.)

THESE Signal-lamps are manufactured to special Services' requirements and specifications and conform to the usual high BULGIN standards. The first two models accept M.E.S. cap-lamp bulbs (B.S. 98/E.10) and the third model is designed for S.B.C.-cap lamp bulbs. It is important, when ordering, to quote the full list number and specify the colour of lens required.

SEALED INTER-SERVICES' TYPE

This new fitting, intended for M.O.S.—Ref. Nos.:—M.E.S. Holder: ZA.37642, + LENS CAP: ZA.37643 (RED) or ZA.37644 (GREEN) or ZA.37645 (WHITE), is designed for Services' Watertight equipment, and is provided with mounting Seals. The coloured Phenol-Formaldehyde-Urea (thermosetting) Lens-Cap (with metallic-insert-rim) also seals to the body, but the central rear terminal-exit is sealed in addition, so that even removal or breakage of the Lens-Cap will not permit ingress of moisture to the equipment. With metallic (N.F.) body and moulded panel-insulating bushes, all metal parts are silver-plated to D.T.D.904.



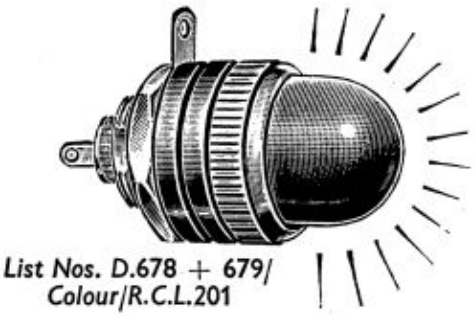
List Nos. D.676 + 677/ Colour/R.C.L.201

List No.	Available Colours TransLUCENT only	M.O.S. No.	Description
D.676 R.C.L.201	—	Z.A. 37642	Panel-mtg. E.10 Holder; with bushing washers and seals.*
D.677 colour **R.C.L.201**	RED; GREEN; WHITE	Z.A.37643 Z.A.37644 Z.A.37645	'Lens-'caps for above

*Special fixing hole required; see R.C.L.201 and BULGIN and Services' drgs.

SPLASH-PROOF, BUT NOT SEALED

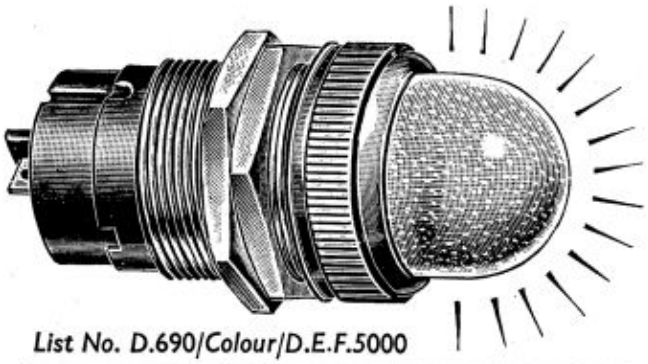
A second model, of matching appearance and lamp-acceptance, splash-proof but not sealed, for M.O.S.—Ref. Nos.:—M.E.S. HOLDER: ZA.39180 + LENS CAP: ZA.39182 (RED) or ZA.39181 (GREEN) or ZA.39183 (WHITE). This model, *also*, may be panel-mounted so as to be 'live' to panel if the moulded-bushings are omitted. Similarly, this model gives brilliant 180° + illumination-angle, half-spherically. Both models conform to R.C.L.201 (Prov.).



List Nos. D.678 + 679/ Colour/R.C.L.201

List No.	Available Colours, TransLUCENT only	M.O.S. No.	Description
D.678 R.C.L.201	—	Z.A.39180	Panel-mtg. E.10 holder; wih bushing washers.*
D.679 Colour **R.C.L.201**	RED; GREEN; WHITE	Z.A.39182 Z.A.39181 Z.A.39183	'Lens'-Caps for above

*Special fixing hole required; see R.C.L.201 and BULGIN and Services' drgs.



List No. D.690/Colour/D.E.F.5000

ELECTRICAL DATA FOR D.676–679 TYPES

Very High I.R. @ 1KV. peak or d.c. dry or recovered. Internal-socket = B.S.98/E.10 (M.E.S.) for Lamps of up to 16 mm. sph.-Ø-balloon, Max. w., 2·8. Max. Working P.D., 150V. (Provisional data.)
Colours: Red, Green, White (all trans*lucent* only). "Perbunan" Seals and socket-insulation to D.676/7 only.

U.S.A. SERVICES' TYPE SIGNAL-LAMP

This brand new model in the BULGIN range conforms to D.E.F.5000 specification and accepts S.B.C. -cap lamp bulbs (B.S.52/15d.) of up to 16 mm. balloon diameter, of 50 V. max., 1 A. max., 3 W. max. Black-Nickel barrel and lens bush. Transparent thermo-plastic lens with interior mottling to give frosted effect, suitable for max. wkg. temperatures of 65°C. Rigid rear-of-panel integral terminals are heavily Silver-plated. These are solid with the plungers, more when lamp is inserted; the springs do not carry current.

List No.	Available Colours, TransPARENT Lenses	INTERNAL SOCKET	Fixing hole	Front proj'n	O.A. length	Max. Panel Thick's
D.690/Colour DEF.5000	Red, Amber, Green, Blue, Water-clear	B.S. 52/B.15d	$1\frac{1}{64}$" Ø (25·8 mm.)	$1\frac{1}{32}$" (26·2 mm.)	$2\frac{39}{64}$" (66·3 mm.)	$\frac{17}{32}$" (13·5 mm.)
D.691/Colour DEF.5000	= CAP ALONE; ,,					
D.692/DEF.5000	= BODY ALONE	B.S.52/B.15d				

DESIGNED FOR LOW-VOLTAGE M.E.S. & M.B.C. (M.C.C.) CAP LAMPS

(Patent No. 706,592)

THE NEW BULGIN THREE-COLOUR SIGNAL LAMP

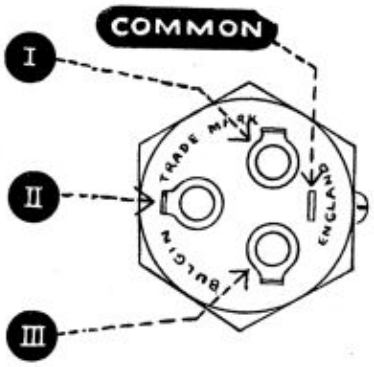
ONCE again, the HOUSE OF BULGIN still leads with this outstanding Multi-Colour Signal Lamp Fitting ! This new Component has clear colourless plastic or *glass front-lens, and three internal plastic colour-filters and three M.E.S. lamp-sockets ; three alternative colour signals appear over about 60°–90° conical viewing angle, through the single neutral front lens ! Made in the usual superlative BULGIN Quality, with highest grade materials and finishes. For 10 mm.⌀ × 18 mm. M.E.S. low-voltage standard Pilot Bulbs, as type 9 on pp. 83–85, and with choice of filter colours ; normally supplied RED + GREEN + BLUE, (**List No. " /4 "** combination, other types made up to order ; ten Combinations of Colours are possible ; full details below). For panels 18 S.W.G. to $\frac{3}{8}$" thick, $1\frac{1}{32}$"⌀ hole. Max. rear-of-panel depth, $2\frac{13}{64}$" (for M.E.S. models) or $2\frac{35}{64}$" (for M.B.C. models), × $1\frac{9}{32}$"⌀ approx. Four Ag-plated tags for connections (one = common). For use at up to 50 V. across poles, 250 V. A.C. max. test-V. I.R. ≮ 40 MΩ pole–pole, 100 MΩ to E, *dry*. 'Tropical' models, and/or models to special specifications, to special quantity orders. Maximum dissipation within fitting is 1·8 watts.

D.671/1 to 10

3 COLOURS IN ONE FITTING FOR SUCCESSIONAL SWITCHING CONTROL

STANDARD COMBINATIONS OF COLOURS AVAILABLE

List Nos.		INTERNAL COLOURS		
M.E.S. Internal Lamp-holders	M.B.C. Internal Lamp-holders	Connection No.:		
PLASTIC front Lens	PLASTIC front Lens	I	II	III
D.671/1	**D.671/1 /M.B.C.**	RED	AMBER	GREEN
D.671/2	**D.671/2 /M.B.C.**	RED	AMBER	BLUE
D.671/3	**D.671/3 /M.B.C.**	RED	AMBER	W/CLEAR
D.671/4	**D.671/4 /M.B.C.**	RED	GREEN	BLUE
D.671/5	**D.671/5 /M.B.C.**	RED	GREEN	W/CLEAR
D.671/6	**D.671/6 /M.B.C.**	RED*	BLUE	W/CLEAR
D.671/7	**D.671/7 /M.B.C.**	AMBER	GREEN	W/CLEAR
D.671/8	**D.671/8 /M.B.C.**	AMBER	BLUE	W/CLEAR
D.671/9	**D.671/9 /M.B.C.**	GREEN	BLUE	W/CLEAR
D.671/10	**D.671/10 /M.B.C.**	AMBER	GREEN	BLUE



NOTE.—The above rear-view illustration shows the arrangement of the solder-tags in relationship to the coloured internal lens combinations shown in table on left ; please order by appropriate List No.

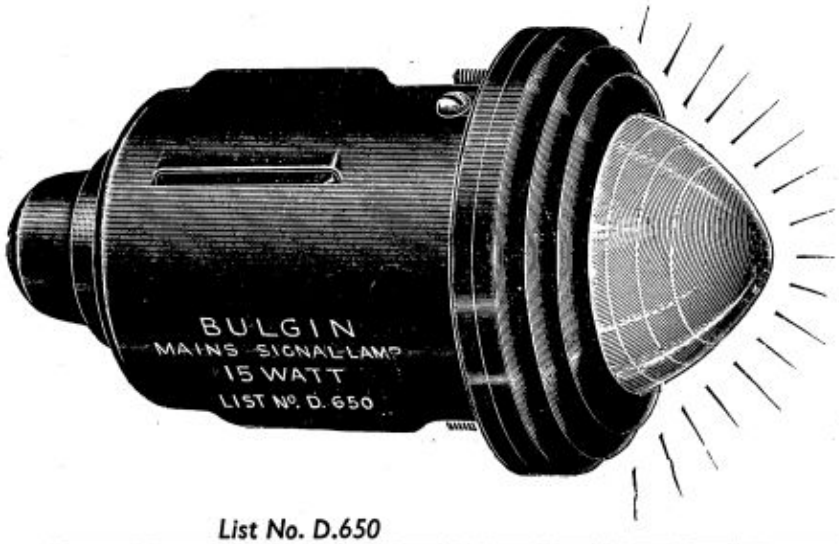
3 DIFFERENT COLOUR SIGNALS IN 1 FITTING

SIGNAL-LAMP FITTINGS

(MAINS AND LOW VOLTAGES)

LARGE MAINS SIGNAL-LAMP—B.C. (BS.52/B.22) HOLDER.

THESE Large Mains Signal Lamp fittings are designed to be used either with PIGMY SIGN lamps or with INDICATOR NEONS (*up to* 250 *V.*) with standard Bayonet-Cap. A full range of coloured-GLASS transparent lenses is available: (*Avoid Green with Neon lamps*). Plastic lenses are *not* supplied for this model. Highly polished Black moulded bakelite front bushes and screw-on black bezels, with non-ferrous metal body, crackle-black finished, and solid-plungers bakelite lamp-holder, with terminals-shroud. Coloured front mouldings to quantity orders only. These fittings are adequately louvred for ventilation, but are light-trapped, so that used side-by-side, they will not cross-light each other, thus avoiding false signals. Suitable for all mains-voltage uses and in all types of apparatus and equipment, with standard, easily obtained lamps. The use of coloured lamps or neons (15 W. Pigmy sign-B.C. size) may be contemplated with colourless (" water-clear ") lenses: this gives excellent contrast between lit and unlit conditions, and avoids even unlikely false signals due to stray outside or room lighting. Fixing screws are concealed by lens-bezel. Size: 2·822″ ⌀ x $4\frac{31}{32}$″ (71·2 mm. ⌀ x 119 mm.) Front of panel projection $1\frac{15}{32}$″ (37·3 mm.).



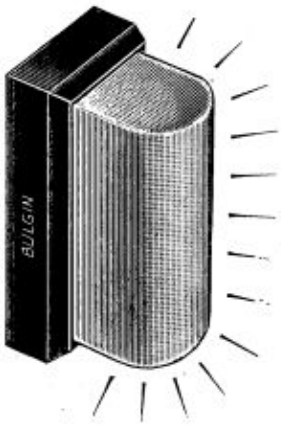
List No. D.650

List Nos. and available GLASS " lens " colours						Bezel Max. ⌀	Panel Hole ⌀	Max. Panel Thickness	Front of Panel Projection	Fixing Dims.	Max. Rear of Panel Depth	Lamp-holder	Recommended lamps pp. 83-85. Illus: Nos.
Red	Amber	Green	Blue	White†	Water-Clear								
D.650 /Red	**D.650 /Amber**	**D.650 /Green**	Not normally available	**D.650 /White**	**D.650 /Clear**	2·822″ (71·2 mm.)	$2\frac{1}{4}$″ (57·2 mm.)	$\frac{13}{16}$″ (20·7 mm.)	$1\frac{15}{32}$″ (37·3 mm.)	3 × 6 B.A. clear on $2\frac{3}{8}$″ (60·5 mm.) P.C.D. at 120°, or equiv. Slots	$4\frac{11}{32}$″ (119 mm.) *less* thickness of Panel	B.C. (B.S. 52 B.22)	16, 20

N.B.—With Neon Lamps (Lamp No. 16, p. 82), avoid GREEN or BLUE Lenses. An S.B.C. version, for Lamps Nos. 3, 18 (pp. 83–85) can be supplied to quantity orders only, by special manufacture. (D.650/S.B.C./COLOUR.)

† = Internally-frosted water-clear.

LOW-VOLTAGE SIGNAL LAMP for Festoon-Bulbs



List No. D.693/colour

THIS NEW and useful fitting takes standard 6 mm. ⌀ x 35·5 mm. long (*nom. dims.*). Festoon-Bulbs (*as used in Trafficators*) of up to 3 W. max. dissipation, held internally between strong bronze clips. With snap-out trans*lucent* front cover, thermo-setting, (colours as below,) and polished black bakelite type base. Internal 6BA terminal-screws, wiring may be surface (knock-outs provided) or rear (*or fix by stems into terminals*). For all Signals, Lifts, Telephones, Interior-Lights- etc., at up to 50 V., P.D.

Lamps (see page 85; made at 6 V., 12 V.,—also 24 V., 30 V., 50 V., are known) to be of 3 W. max.

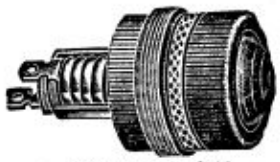
LIST Nos.	Base Space Occupied	Front Proj'n.	Fixing Holes	Max. Cable O.A.	LAMP: see p.85
D.693/Red; D.693/Orange; D.693/Green; D.693/Blue; D.693/White.	$1\frac{7}{8}$″ x $\frac{7}{8}$″	1″	2 x $\frac{9}{64}$″ ⌀ at $1\frac{1}{2}$″ crs., + one central = 6BA clear. OR	4 x 3 mm. ⌀	32
			3 x 6BA clear for live stems, @ 1″ crs.		

(M.E.S., LOW VOLTAGE)

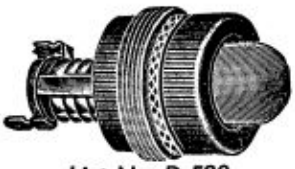
LOW VOLTAGE SIGNAL-LAMP FITTINGS, M.E.S.

THIS range of Signal-Lamp Fittings are characterised by easy bulb access, many having clip-on holders. All metal parts heavily plated, highest-grade insulation throughout. All these models have 'dead' frames; max. peak working V. to E., 250. Dry I.R. ⩽ 40M Ω @ 500 V. (max. peak test V.). Plastic 'Lenses' and black plastic bezels*, for ⩾ 65° C. working, R.H. ⩾ 80%. Glass lenses suppliable in large single-order quantities, 1,000 *min.* Lamp bulbs are *not* supplied, but all standard sizes, of well-known makes, are accepted. Max. A., 1. Max. W., 2. Fixing to panels of 18 S.W.G.–$\frac{1}{16}$".

List No. D.270

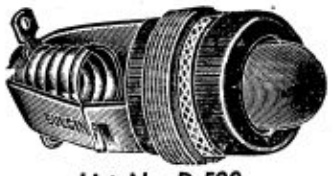


List No. D.350



List No. D.580

List No. D.370



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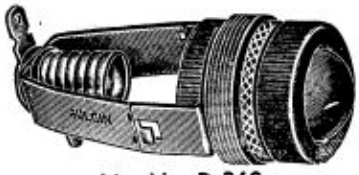


List No. D.360

ORDER BY LIST NO., + LENS-COLOUR REQUIRED†

List No.	Type of Lens	General Description		Recommended Lamps, pp. 83–85
D.270 / **D.277**	**Transparent** / **Translucent**	Small metal-bush type, bezel or bush-face CHROMIUM-plated and polished		5, 19, 28, 29
Approx. Lens Ø	*Fixing Hole Ø*	*Max. balloon Ø of Lamp*	*Access to Lamp*	*Connections*
$\frac{3}{8}$" (9·5 mm.)	$\frac{3}{8}$" (9·5 mm)	*12 mm.*	*Rear*	*SILVER-plated solder-tags*
D.350 / **D.357**	**Transparent** / **Translucent**	Moulded-bush type, normally with black moulded bezel. Metal Bezel* to order		5
$\frac{19}{32}$" (15·25 mm.)	$\frac{3}{4}$" (19 mm.)	*10 mm.*	*Front*	*SILVER-plated solder-tags*
D.580 / **D.330**	**Transparent** / **Translucent**	Moulded-bush type, normally with black moulded bezel. Metal Bezel* to order		5, 9
$\frac{19}{32}$" (15·25 mm.)	$\frac{3}{4}$" (19 mm.)	*10 mm.*	*Front*	*SILVER-plated solder-tags*
D.370 / **D.377**	**Transparent** / **Translucent**	Metal bush and -bezel (polished chromium plated). Bezel (lens *fixed*) unscrews from bush		5, 9
$\frac{1}{2}$" (12·75 mm.)	$\frac{3}{4}$" (19 mm.)	*10 mm.*	*Front*	*SILVER-plated solder-tags*
D.590 / **D.340**	**Transparent** / **Translucent**	Moulded bush type, normally with black moulded bezel. Metal Bezel* to order		5, 9, 19
$\frac{19}{32}$" (15·25 mm.)	$\frac{3}{4}$" (19 mm.)	*10 mm.*	*Rear*	*SILVER-plated solder-tags*
D.360 / **D.367**	**Transparent** / **Translucent**	Moulded bush type, normally with black moulded bezel. Metal Bezel* to order		5, 9, 19
$\frac{19}{32}$" (15·25 mm.)	$\frac{3}{4}$" (19 mm.)	*10 mm.*	*Rear*	*SILVER-plated solder-tags*

For Services' use, or in exacting climatic conditions, we can supply our standard tropical versions (add **T/—** *to* **List No.***) or special tropical versions* **to quantity orders** *comforming to Specification R.C.S.-1000 (add* **—/R.C.S.-1000** *to* **List No.***)*

* Add **/M** to List No. (after adding colour) to obtain with METAL-Bezel. Highly polished CHROMIUM-plate is normal finish. Special other metal finishes supplied to quantity order.

† LENS-COLOURS: Add desired colour to chosen List No.

TRANS**PARENT**: **Red** *or* **Amber** *or* **Green** *or* **Blue** *or* **Water-clear.**

TRANS**LUCENT**: **Red** *or* **Orange** *or* **Green** *or* **Blue** *or* **White.**

Examples:—**D.270/Amber** *or* **D.277/Orange**

Plastic Lenses will work at up to 65° C. lens-temperature, and are generally standard. **GLASS LENSES** can be supplied if specially requested, at extra cost. (With **Glass** Lenses, the front projection may increase by +1 or +2 mm. approx.) STOCK COLOURS: RED, GREEN, BLUE, AMBER, COLOURLESS, in CLEAR-TRANSPARENT. When ordering, add "/**G**" to List No., and specify colour and finish very clearly. (DOUBLE-FROSTED glass lenses, equivalent to translucent plastic types, only supplied to quantity orders, or by special arrangement.)

SIGNAL-LAMP FITTINGS

(M.E.S., M.B.C., LOW VOLTAGE)

LOW VOLTAGE SIGNAL-LAMP FITTINGS, M.E.S., M.B.C.

THIS range of BULGIN Signal-Lamp-Holders covers rear-of-panel lamp-access types, with both M.E.S. (B.S.98/E.10) and M.B.C. (M.C.C., B.S.52/Ba.9s.) sockets. Lamps with almost any shape or size of " balloon " may be used. All metal parts are highly plated ; front-of-panel details are highly polished chromium-plated as standard. Insulation is of high grade S.R.B.P. or -F. All types have ' dead ' frames and fixing. Plastic lenses are standard ; glass lenses can be supplied to order. See pp. 83–85 for recommended lamps. ORDER BY LIST NO., + LENS-COLOUR REQUIRED†

List No.	Type of Lens	Connections	General Description	Recommended Lamps
D.170/M.B.C.	Transparent	Terminals	Small-Panel-Lens and rear-bracket M.B.C. Holder. Adjustable, to centre filament behind Lens	6, 8, 10, 11, 17, 18, 27, 30.
D.180/M.B.C.		Tags		
D.177/M.B.C.	Translucent	Terminals		
D.187/M.B.C.		Tags		

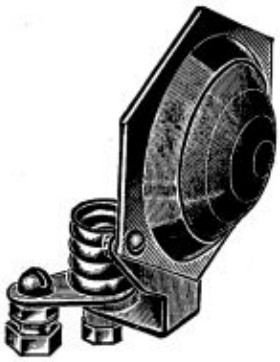
Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Notes
⅜" (9·5 mm.)	⅜" (9 mm.)	20 mm. approx.	Rear	Apart from centreability of filament when first fixing, bracket is bendable

List No.	Type of Lens	Connections	General Description	Recommended Lamps
D.170	Transparent	Terminals	Small-Panel-Lens and rear bracket M.E.S. Holder. Adjustable, to centre filament behind Lens	5, 7, 9, 19, 28, 29.
D.180		Tags		
D.177	Translucent	Terminals		
D.187		Tags		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Notes
⅜" (9·5 mm.)	⅜" (9·5 mm.)	20 mm. approx.	Rear	Apart from centreability of filament when first fixing, bracket is bendable

List No.	Type of Lens	Connections	General Description	Recommended Lamps
D.7/M.B.C.	Transparent	Terminals	Large-Panel-Lens and rear bracket M.B.C. Holder. Adjustable, to centre filament behind Lens	2, 6, 8, 10, 11, 17, 18, 27, 30.
D.450/M.B.C.		Tags		
D.108/M.B.C.	Translucent	Terminals		
D.457/M.B.C.		Tags		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Notes
1⅛" (23·5 mm.)	3×0·1"Ø on rad. 1⅜"@120°, + centre hole	20 mm. approx.	Rear	Bracket may be bent



List No.	Type of Lens	Connections	General Description	Recommended Lamps
D.7	Transparent	Terminals	Large-Panel-Lens and rear bracket M.E.S. Holder. Adjustable, to centre filament behind Lens	1, 5, 7, 9, 19, 28, 29
D.450		Tags		
D.108	Translucent	Terminals		
D.457		Tags		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Notes
1⅛" (23·5 mm.)	3×0·1"Ø on rad. 1⅜"@120°, + centre hole	20 mm. approx.	Rear	Bracket may be bent

For Services' use, or in exacting climatic conditions, we can supply our standard tropical versions (add **T/—** *to* **List No.)** *or special tropical versions* **to quantity orders,** *conforming to Specification* R.C.S.1000 *(add* **—/R.C.S.1000** *to* **List No.)**

† LENS COLOURS : Add desired colour to chosen List No.
TRANS**PARENT** : **Red** *or* **Amber** *or* **Green** *or* **Blue** *or* **Water-clear.**
TRANS**LUCENT** : **Red** *or* **Lt. Orange** *or* **Green** *or* **Blue** *or* **White.**
Examples : **D.180/M.B.C./Amber**
or **D.187/M.B.C./Lt. Orange**

Plastic Lenses will work at up to 65° C. lens-temperature, and are generally standard. **GLASS LENSES** can be supplied if specially requested, at extra cost. (With **Glass** lenses, the front projection may increase by +1 or +2 mm. approx.) STOCK COLOURS: RED, GREEN, BLUE, AMBER, COLOURLESS, in CLEAR-TRANSPARENT. When ordering, add "/**G**" to List No., and specify colour and finish very clearly. (DOUBLE-FROSTED glass lenses to counterpart translucent plastic types, only supplied to quantity orders, or by special arrangement.)

LOW VOLTAGE, M.B.C.

LOW VOLTAGE SIGNAL-LAMP FITTINGS, M.B.C.

THIS range of Signal-Lamp Fittings is characterised by easy bulb access, all having clip-on holders. All have M.B.C. Sockets (B.S.52/Ba.9s.), also called 'M.C.C.' All metal parts heavily plated, highest-grade insulation throughout. All these models have 'dead' frames; max. peak working V. to E., 250. Dry I.R. $\not<$ 49MΩ at 500 V. (max. peak test V.). Plastic 'Lenses' and black plastic bezels,* for $\not>$ 80°C. working, R.H. $\not>$ 70%. Lamp bulbs are *not* supplied, but all standard sizes, of well-known makes, are suitable, see pp. 83–85. Max. A., 1. Max. W., 2.

ORDER BY LIST NO., + LENS-COLOUR REQUIRED†

List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.270 /M.B.C.	Trans-parent	Small-Lens-type, Metal Bezel only, normally highly polished Chromium-plated	6, 18, 27, 30
D.277 /M.B.C.	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Max. Panel	Connections
3/8" (9·5 mm.)	3/8" (9·5 mm.)	11 mm.	Rear	1/4"	SILVER-plated Solder-tags

+

List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.370 /M.B.C.	Trans-parent	Medium-Lens-type, Metal Bezel only (normally Chromium-plated-polished). Lens unscrews from Fixing-bush	10, 11
D.377 /M.B.C.	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Max. Panel	Connections
1/2" (12·75 mm.)	3/4" (19 mm.)	11 mm.	Front	1/4"	SILVER-plated Solder-tags

List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.360 /M.B.C.	Trans-parent	Moulded-bush and -Bezel* type with discard-washers for panels above 18 S.W.G.	6, 10, 11, 18
D.367 /M.B.C.	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Max. Panel	Connections
19/32" (15·25 mm.)	3/4" (19 mm.)	11 mm.	Rear	1/8"	SILVER-plated Solder-tags

List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.590 /M.B.C.	Trans-parent	Moulded-bush and -Bezel* type with discard-washers for panels above 18 S.W.G.	6, 10, 11, 17, 18
D.340 /M.B.C.	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Max. Panel	Connections
19/32" (15·25) mm.)	3/4" (19 mm.)	11 mm.	Rear	1/8"	SILVER-plated Solder-tags

For Services' use, or in exacting climatic conditions, we can supply our standard tropical versions (add **T/—** *to* **List No.**) *or special tropical versions* **to quantity orders,** *conforming to Specification R.C.S.*1000 (*add* **—/R.C.S.**1000 *to* **List No.**)

* Add **/M** to List No. (after adding colour) to obtain with METAL-Bezel. Highly polished CHROMIUM-plate is normal finish. Special other metal finishes supplied to quantity order.

† LENS-COLOURS: Add desired colour to chosen List No.
TRANS**PARENT**: **Red** *or* **Amber** *or* **Green** *or* **Blue** *or* **Water-clear.**
TRANS**LUCENT**: **Red** *or* **Orange** *or* **Green** *or* **Blue** *or* **White.**

Examples: **D.270/Amber** *or* **D.277/Orange**

Plastic Lenses will work at up to 65° C. lens-temperature, and are generally standard. **GLASS LENSES** can be supplied if specially requested, at extra cost. (With **Glass** lenses, the front projection may increase by +1 or +2 mm. approx.) STOCK COLOURS: RED, GREEN, BLUE, AMBER, COLOURLESS, in CLEAR-TRANSPARENT. When ordering, add "/**G**" to List No., and specify colour and finish very clearly. DOUBLE-FROSTED, glass counterparts of translucent plastic lenses, can only be supplied to quantity order or by special arrangement.

SIGNAL-LAMP FITTINGS
(LOW VOLTAGE)

LOW VOLTAGE SIGNAL-LAMP FITTINGS, M.E.S.

THE wide range of M.E.S.-socket (BS.98/E.10) Signal-Lamp Fittings includes both new and well-tried popular models, all fully enclosed, and all for ¾"Ø fixing hole. All models normally have a black moulded bezel (lens-retaining cap), but metal bezels *at front* are supplied to order(*). Front or rear-and-front access for lamp replacement is shown in the tables below. ††Glass-lenses are supplied to order for trans*parent*-lens types only. Double-frosted glass lenses to counterpart trans*lucent* plastic lenses, are only available to special large-quantity orders, or by prior arrangement.

Elec. Data for all models (Working). Max. V., 180 (or 250 via series Ω). Max. V. to E., 250 (for ' not live-to-case ' models). Max. A., 1. Max. W., 2 (but max. temp. for plastic lenses = 65° C.). **(Test)** 250 V. across poles, 500 V. to E (for ' not-live ' metal-body types) or 1KV. to E (for moulded-body types). I.R. (dry or recovered), ≮ 40MΩ at 250 V. **Mechanical :** ¾"Ø threads, 26 t.p.i., Whit.-form.

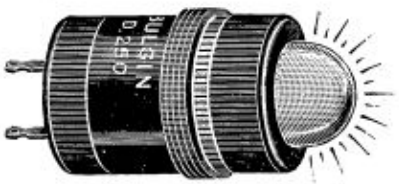
ORDER BY LIST NO., + LENS COLOUR REQUIRED†

List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.420	Trans-parent	Metal body (brass, nickel plated), live to fixing, MOULDED rear insulation	5, 9
D.45	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Connections
19/32" (15·25 mm.)	¾" (19 mm.)	11 mm.	Front	6 B.A. screws as terminals

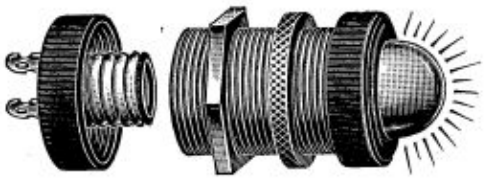
List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.420/1	Trans-parent	Metal body (brass, nickel-plated) live to fixing. S.R.B.P. or -F rear insulation	5, 9
D.45/1	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Connections
19/32" (15·25 mm.)	¾" (19 mm.)	11 mm.	Front	6 B.A. clamp terminals



List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.440	Trans-parent	All moulded body, with discard-washers for panels above 18 S.W.G. Rear insulation, S.R.B.P. or F.	5, 9
D.250	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Connections
19/32" (15·25 mm.)	¾" (19 mm.)	11 mm.	Front	SILVER-plated Solder-tags



List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.430**	Trans-parent	Metal body (brass, nickel-plated) threaded full length	5, 9
D.49**	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Connections
19/32" (15·25 mm.)	¾" (19 mm.)	11 mm.	Front or Rear	SILVER-plated Solder-tags

For Services' use, or in exacting climatic conditions, we can supply our standard tropical versions (add **T/—** *to* **List No.***) or special tropical versions* **to quantity orders,** *conforming to Specification R.C.S.*1000 *(add —/***R.C.S.1000** *to* **List No.***)*

†† With **Glass** lenses, the front projection may increase by +1 or +2 mm. approx.

* Add **/M** to List No. (after adding colour) to obtain with METAL-Bezel. Highly polished CHROMIUM-plate is normal finish. Special other metal finishes supplied to quantity order.

† LENS-COLOURS : Add desired colour to chosen List No.
TRANS**PARENT** : **Red** *or* **Amber** *or* **Green** *or* **Blue** *or* **Water-clear**
TRANS**LUCENT** : **Red** *or* **Orange** *or* **Green** *or* **Blue** *or* **White.**
Examples :—**D.440/Amber** *or* **D.250/Orange**

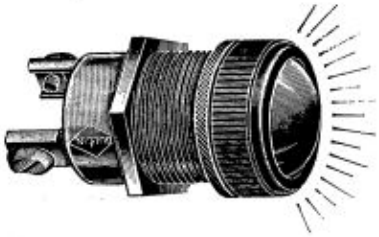
** Also available with M.B.C. fitting to accept lamps 6, 8, 10, 11, 27, 30, pages 83–85. Add '—/**MBC**' to List No.

(LOW VOLTAGE)
LOW VOLTAGE SIGNAL-LAMP FITTINGS, M.E.S.

THE wide range of M.E.S.-socket (BS.98/E.10) Signal-Lamp Fittings includes both new and well-tried popular models, all fully enclosed, and all for ¾"Ø fixing hole. All models normally have a black moulded bezel (lens-retaining cap), but metal bezels *at front* are supplied to order(*). Front or rear-and-front access for lamp replacement is shown in the tables below. ††Glass-lenses are supplied to order for trans*parent*-lens types only. Double-frosted glass lenses, to counterpart trans*lucent* plastic lenses, are only available to special large-quantity orders, or by prior arrangement.

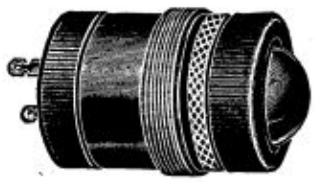
Elec. Data for all models (Working). Max. V., 180 (or 250 via series Ω). Max. V. to E., 250 (for ' not live-to case ' models). Max. A., 1. Max. W., 2 (but max. temp. for plastic lenses = 65° C.). **(Test)** 250 V. across poles, 500 V. to E (for ' not-live ' metal-body types) or 1KV. to E (for moulded-body types). I.R. (dry or recovered), ≮ 40M Ω at 250 V. **Mechanical :** ¾"Ø threads, 26 t.p.i., Whit.-form.

ORDER BY LIST NO., + LENS COLOUR REQUIRED†



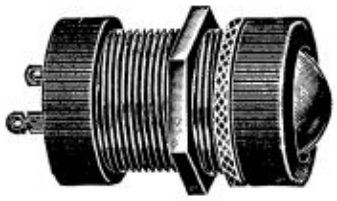
List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.9/1	Trans-parent	Metal body (brass, nickel plated) live to fixing, MOULDED rear insulation	5
D.105/1	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Connections
19/32" (15·25 mm.)	¾" (19 mm.)	10 mm.	Front	6 B.A. clamp terminals



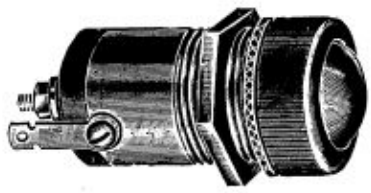
List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.200	Trans-parent	All-moulded body with discard-washers for panels above 18 S.W.G. Rear insulation, S.R.B.P. or -F.	5
D.207	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Connections
19/32" (15·25 mm.)	¾" (19 mm.)	10 mm.	Front	SILVER-plated Solder-tags



List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.109**	Trans-parent	Metal body, nickel-plated on brass, *not* live to fixing, S.R.B.P. or -F, rear insulation	5
D.114**	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Connections
19/32" (15·25 mm.)	¾" (19 mm.)	10 mm	Front	SILVER-plated Solder-tags



List No.	Type of Lens	General Description	Recommended Lamps, pp. 83–85
D.9	Trans-parent	Metal body as above, rear insulation by moulding	5
D.105	Trans-lucent		

Approx. Lens Ø	Fixing hole Ø	Max. balloon Ø of Lamp	Access to Lamp	Connections
19/32" (15·25 mm.)	¾" (19 mm.)	10 mm.	Front or Rear	6 B.A. Screws as terminals

For Services' use, or in exacting climatic conditions, we can supply our standard tropical versions (add **T/—** *to* **List No.)** *or special tropical versions* **to quantity orders,** *conforming to Specification R.C.S.*1000 *(add* **—/R.C.S.1000** *to* **List No.)**

†† With **Glass** lenses, the front projection may increase by +1 or +2 mm. approx.

* Add **/M** to List No. (after adding colour) to obtain with METAL-Bezel. Highly polished CHROMIUM-plate is normal finish. Special other metal finishes supplied to quantity order.

† LENS-COLOURS : Add desired colour to chosen List No.
TRANS**PARENT** : **Red** *or* **Amber** *or* **Green** *or* **Blue** *or* **Water-clear.**
TRANS**LUCENT** : **Red** *or* **Orange** *or* **Green** *or* **Blue** *or* **White.**
Examples :—**D.109/Amber** *or* **D.114/Orange**

** Also available with M.B.C. fitting to accept lamps 6, 8, 27, 30, pages 83–85. Add '**—/MBC**' to List No.

SIGNAL-LAMP FITTINGS
(LOW VOLTAGE)

SPECIAL TRANSPARENT-COLOUR CAP-LENS FOR ¾"Ø-THREADED SIGNAL LAMPS

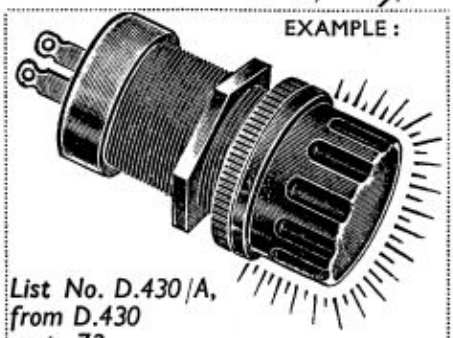
WE are now able to release, for general commercial uses, this special new plastic Cap-Lens which may be applied to any standard BULGIN Signal Lamp (on preceding pages) with threaded 26 t.p.i. ¾"Ø body. It then replaces the separate lens and retaining-bezel, and is normally automatically supplied complete with full-Ø chromed and polished front-of-panel fixing ring. To obtain this alternative lens, add suffix : "—/A" to chosen List No., still stating colour required :—e.g., **D.430/RED/A.** Max. wkg. temperature, 65° C. ; Colours are (*transparent*) :—Red, Amber, Green, Blue, Water-clear No glass counterparts available. No *translucent* versions are at present made for general sale from stocks.

Note :—Can only be supplied *with* Signal-Lamp fittings, or as replacement therefor. **Not** supplied **solus.**

Part Nos. 8010–8014 (Lens) With Part No. 8033 (Ring)

TABLE OF SIGNAL-LAMP FITTINGS THUS MODIFIABLE		
From Page 69	From Page 71	From Page 73
All Models :— **D.360, D.367 D.340, D.590,** But NO others on Page 69	All Models :— **D.340/M.B.C. D.590/M.B.C. D.360/M.B.C. D.367/M.B.C.** But NO others on Page 71	All Models on Page 71 Except **D.9 & D.9/1**

EXAMPLE :



List No. D.430/A, from D.430 on p. 72

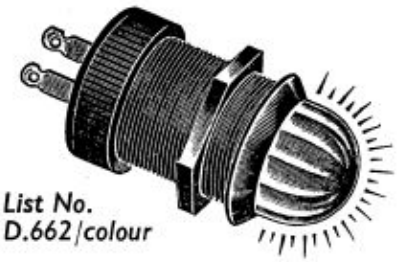
NEW ¾"Ø-FIXING FULL VISION SIGNAL LAMPS

THESE new Signal Lamps cater for 10 mm.Ø × 18 mm. tubular-envelope pilot lamp bulbs (types 9, 10, 11 on pp 83–85), and have the case **not** live to either pole. The integral panel-bezel rim of the brass threaded body is highly-polished chromium-plated and the screw-on lens is in polished trans**parent** plastic, in usual five colours. Soldering tags are provided for connection. Lamp access is both front and rear. **Elec. Ratings : (Working)** 180 V. max. (250 V. via series Ω) across poles ; 250 V. max. to E. 1A. max., 2W. max., Lens-temp. 65° C. max. **(Test)** 250 V. across poles, 500 V. to E. I.R. (dry or recovered) 40M Ω. Complete with one hex. fixing nut, 26 t.p.i., ¾" A.F., d.n.p.

(WITH TRANS**PARENT** LENSES ONLY)

List Nos.	Internal Socket	Max. Panel thickness	Front of Panel Projection	Recommended Lamps, pp. 83–85
D.662/Red D.662/Amber D.662/Green* D.662/Blue* D.662/Water-clear	M.E.S. (B.S. 98/E.10)	½" (12·75 mm.)	21/32" (16·75 mm.)	5, 9, 28*, 29*

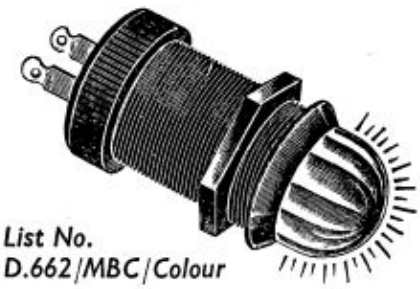
Approx. Lens Ø	Fixing hole Ø	Max. Balloon Ø of Lamp	Access to Lamp	Connections
1" (25·4 mm.)	¾" (19 mm.)	11 mm.	Front or Rear	SILVER-plated Solder-tags



List No. D.662/colour

List Nos.	Internal Socket	Max. Panel thickness	Front of Panel Projection	Recommended Lamps, pp. 83–85
D.662/M.B.C./ Red D.662/M.B.C./ Amber D.662/M.B.C./ Green* D.662/M.B.C./ Blue* D.662/M.B.C./ Water-clear	M.B.C. (M.C.C.) (B.S. 52/Ba.9s.)	⅞" (22.2 mm.)	21/32" (16·75 mm.)	10, 11,* 27,* 30*

Approx. Lens Ø	Fixing hole Ø	Max. Balloon Ø of Lamp	Access to Lamp	Connections
1" (25·4 mm.)	¾" (19 mm.)	11 mm.	Front or Rear	SILVER-plated Solder-tags



List No. D.662/MBC/Colour

GLASS LENSES CANNOT AT PRESENT BE SUPPLIED

* Avoid Green or Blue, with neons.

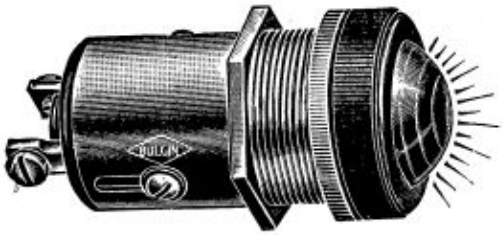
N.B.—Versions for climatic test or use, or in special materials, or to special specifications, may be quoted for, to special inquiries in quantities which would then be specially manufactured.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

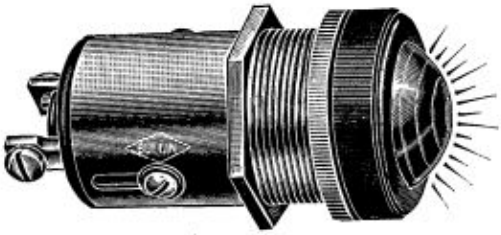
(LOW AND MAINS VOLTAGES)

ENCLOSED SIGNAL-LAMP FITTINGS

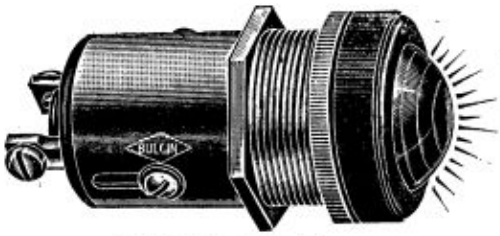
MADE with frosted aluminium tubular bodies, rear moulded bakelite insulation, and bakelite or metal front bezels with plastic or glass lenses. Plastic lenses available transparent or translucent. For panels up to $\frac{3}{8}$" thick ($1\frac{1}{32}$"Ø hole). Front and rear lamp access. Lamp-holder adjustable for approx. $\frac{3}{8}$" along body.



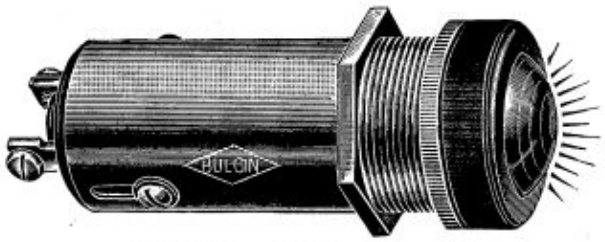
(*M.E.S.*)



(*M.B.C. (M.C.C.)*)



(*S.E.S., Short-body*)



(*S.E.S., Long-body*)

Showing *Metal*-Bezel (- -/**M**)

MECHANICAL DATA for M.E.S., M.B.C., and S.E.S. Short-body models :—

Fixing hole Ø	Rear of Panel Proj'n	Max. balloon Ø of Lamp	Access to Lamp	Thread
$1\frac{1}{32}$" (26·25 mm.)	$1\frac{11}{16}$" max. (50 mm.)	22 mm.	Front & Rear	32 t.p.i. (Whit).

List No. with Lens :—		Internal Lamp-holder	Recommended Lamps (pp. 83–85)
Transparent	Translucent		
D.240/Red **D.240/Amber** **D.240/Green*** **D.240/Blue*** **D.240/Water-clear**	**D.78/Red** **D.78/ Orange** **D.78/Green*** **D.78/Blue*** **D.78/White**	M.E.S. (' E.10 ' of B.S.98)	1, 5, 7, 9, 19, 28, 29 (*Any* with M.E.S.-cap.)
GLASS lenses, *add* " /**G** "	(No GLASS Lenses)		
D.300-Red **D.300/Amber** **D.300/Green*** **D.300/Blue*** **D.300/Water-clear**	**D.133/Red** **D.133/ Orange** **D.133/Green*** **D.133/Blue*** **D.133/White**	M.B.C. (M.C.C.) (' BA.9s' of B.S.52)	2, 6, 8, 10, 11, 17, 18, 27, 30. (*Any* with M.B.C. (M.C.C.)-Cap
GLASS lenses, *add* " /**G** "	(No GLASS Lenses)		
D.210/Red **D.210/Amber** **D.210/Green*** **D.210/Blue*** **D.210/Water-clear**	**D.58/Red** **D.58/ Orange** **D.58/Green*** **D.58/Blue*** **D.58/White**	S.E.S. (' E.14 ' of B.S.98)	12 (or any with S.E.S.-Cap to 22 mm. max. Ø)
GLASS lenses, *add* " /**G** "	(No GLASS Lenses)		

MECHANICAL DATA :—As above, but Rear-of-Panel Proj'n. = $2\frac{11}{16}$" (70 mm.) max., for Long-body S.E.S. models.

List No. with Lens :—		Internal Lamp-holder	Recommended Lamps (pp. 83–85)
Transparent	Translucent		
D.280/Red **D.280/Amber** **D.280/Green*** **D.280/Blue*** **D.280/Water-clear**	**D.54 /Red** **D.54/ Orange** **D.54/Green*** **D.54/Blue*** **D.54/White**	S.E.S. (E.14 of B.S.98)	4, or lamps of similar cap and shape, if available
GLASS lenses, *add* " /**G** "	(No GLASS Lenses)		

Any of the above models can be supplied with *metal* front-bezel, normally chromium-plated and highly polished. *Add* "/**M**" to List No.-combination. Other metallic finishes, or coloured *bakelite*-bezels, to special quantity order, *by arrangement*.

* With *Neon*-Lamps, avoid *Green* or *Blue* Lenses.

IMPORTANT ! With all Neon-Lamps, follow makers' instructions as to series-Ω, if any, to be used.

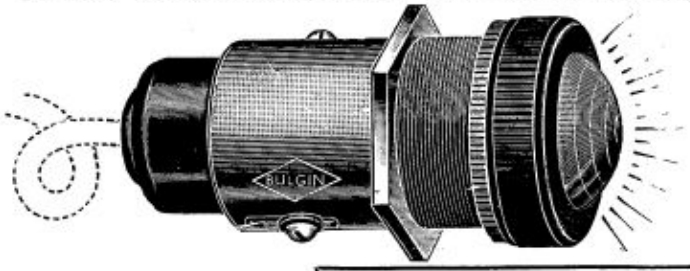
Plastic Lenses will work at up to 65° C. lens-temperature, and are generally standard. **GLASS LENSES** can be supplied if specially requested, at extra cost. (With **Glass** lenses, the front projection may increase by +1 or +2 mm. approx.) STOCK COLOURS: RED, GREEN, BLUE, AMBER, COLOURLESS, in CLEAR-TRANSPARENT. Add "/**G**" to List No., and specify colour and finish very clearly. DOUBLE-FROSTED glass lenses (to counterpart plastic-translucent types) can only be supplied to quantity orders, or by special arrangement.

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

(LOW AND MAINS VOLTAGES)

ENCLOSED SIGNAL-LAMP FITTINGS, S.B.C. (DOUBLE OR SINGLE CONTACT*)

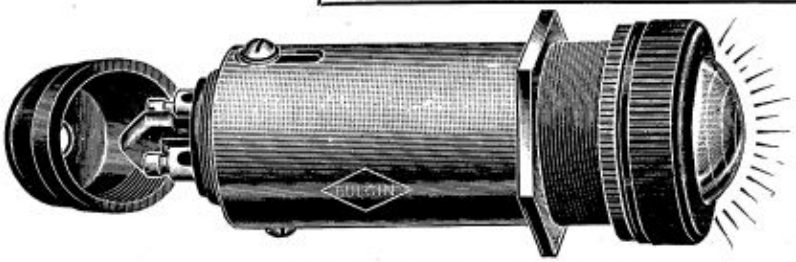
MADE with tubular bodies of frosted aluminium, and rear lamp holders of moulded bakelite with "solid-plunger" contacts. For use with panels up to ⅜" (9·5 mm.) thick. Normally fitted with black bakelite bezel, or metal bezel† to order. Plastic lenses (work at up to 65° C.) in *transparent* or *translucent*; or *glass* lenses** in *transparent* only. Front and rear lamp-access. Lamp holder adjustable ⅜" (9·5 mm.) along body.



Lens-bezel or -retaining-cap is normally BLACK-bakelite. See below† for METAL-bezels. Lenses are normally PLASTIC (65° C. max. working temperature). **GLASS-Lenses can be supplied.

Note the terminals-cover of the rear lamp holder, which has ample cable acceptance and 6 B.A. clamp screws. For 250 V. max. working, and ⚡ 500 V. to E. (S.B.C.)

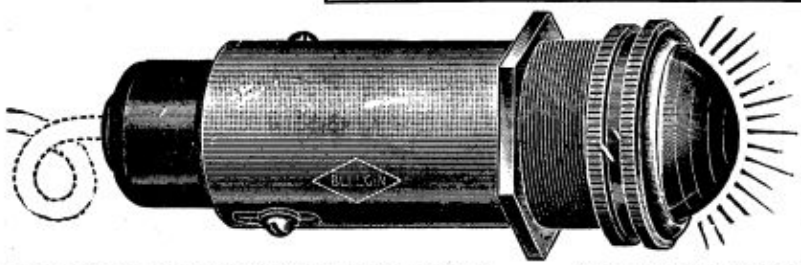
List No. with Lens =		Internal Lamp holder*	O.A. Dimensions	Recommended Lamps, pp. 83–85
Transparent	Translucent			
D.230/Red **D.230/Amber** **D.230/Green** **D.230/Blue** **D.230/Water-clear** GLASS Lenses, add "/G"	**D.220/Red** **D.220/Orange** **D.220/Green** **D.220/Blue** **D.220/White** (No GLASS Lenses stocked)	S.B.C., but S.C.C to **quantity order only**	3" (76 mm.) long × 1 3/16" (30 mm.) max. ∅. Panel hole : 1 1/32" (26·5 mm.) ∅. Panels, up to ⅜" (9·5 mm.) thick. Front proj'n : 1 11/16" (17·5 mm.)	13 (up to 22 mm. max. ∅)



Lens-bezel or -retaining-cap is normally BLACK-bakelite. See below† for METAL-bezels. Lenses are normally PLASTIC (65° C. max. working temperature). GLASS Lenses can be supplied.

Lamp holders can be adjusted ⅜" (9.5 mm.) along the tubular housing or body, and held by the clamp-screws in the body slots.

List No. with Lens =		Internal Lamp holder*	O.A. Dimensions	Recommended Lamps, pp. 83–85
Transparent	Translucent			
D.290/Red **D.290/Amber** **D.290/Green** **D.290/Blue** **D.290/Water-clear** GLASS lenses, add "/G"	**D.84/Red** **D.84/Orange** **D.84/Green** **D.84/Blue** **D.84/White** (No GLASS Lenses stocked)	S.B.C. but S.C.C. to **quantity order only** for any Special Lamps	3 7/8" (98·5 mm.) long × 1 3/16" (30 mm.) max. ∅. Panel hole : 1 1/32" (26 mm.) ∅. Panels, up to ⅜" (9·5 mm.) thick. Front proj'n. : 11/16" (17·5 mm.)	3, 26 (up to 22 mm. ∅). Avoid GREEN or BLUE Lenses with Neon Lamps



† This illustration shows polished chromium-plated metal bezel, which is standard finish for metal bezels. To obtain with this modification, add "/M" to List-No.-combination. To *quantity* orders, bakelite-bezels can be supplied in colours, and metal-bezels can be supplied in other metallic finishes. Please cite quantities and describe finishes fully. Also to *Large Quantity* orders, double-frosted GLASS lenses (which are not stocked) can be supplied to equivilate **translucent**-plastic lenses.

Users of neon lamps should follow Lamp-makers' instructions for series-Ω, if any. Lamps styles 3, 26 (p. 83) are often used with WATER-CLEAR-lenses, with good contrast on lit-unlit states.

* S.B.C. is "Small Bayonet Cap," double contact (to B.S.52, B.15d.). The Lamp holder is all-moulded, with solid-plungers. *Single*-contact small-bayonet-cap, known as S.C.C. (Small Centre Contact), as often used for car side-lamps, etc., can be supplied to order, in *brass* lamp holder rear-fitting, with conventional plunger contact for 1 Amp. max. S.C.C. is only used for low voltages, as lampholder-frame and signal-lamp case are then together the second pole or connexion.

** With **Glass** lenses, the front projection may increase by +1 or +2 mm. approx.

S.E.S. & B.C. SIGNAL-LAMP HOLDERS

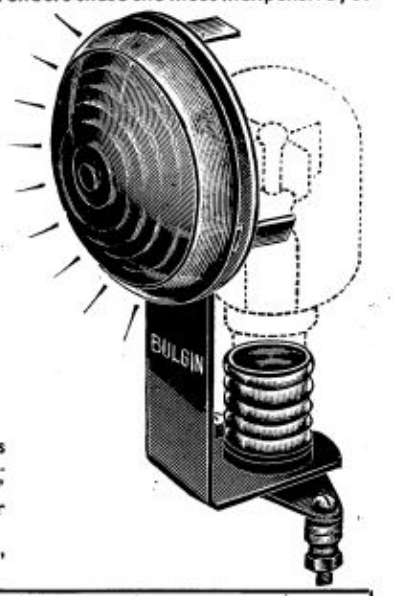
(E.14 SIZE, B.S.98 ; B.22 SIZE, B.S.52)

SIGNAL-LAMP FITTINGS FOR S.E.S.-CAP "PIGMY SIGN" AND "INDICATOR NEON" LAMPS

INEXPENSIVE but useful and reliable fittings which include the Chromium-plated Lens Bezels, D.645, 646, etc., shown on page 82 and will fix through panels by the tongues of the Lens Bezels concerned. Made in 20 S.W.G. Cadmium-plated steel, and fitted with B.S.98/E.14 "S.E.S." lamp socket. Silver-plated contacting members. The bezels are normally highly polished chromium plated. These fittings accept 15 W. "Pigmy Sign" mains-voltage filament lamps with S.E.S. cap (B.S.98/E.14), or Neon Indicator Lamps. See illustration Nos. 4, 15, pages 83–85. This type of Lamp cap renders these the most inexpensive yet reliable holders ; the Lamps with S.E.S.-cap are as easily obtained. For max. 250 V. working, 1,000 V. test (peak).

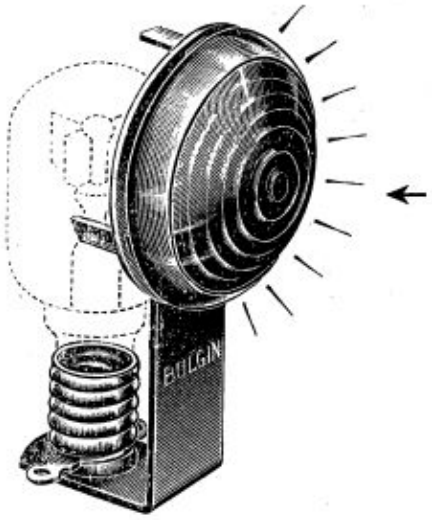
List No. with Transparent Lens-Bush	List No. with Translucent Lens-Bush	List No. *without* Lens-Bush	Connections	Panel-area occupied	Fixing Dimensions	Depth at rear
D.687/ Colour†	**D.688/ Colour†**	**S.E.S. 49**	6 B.A. Terminals	$1\frac{5}{16}$" × $3\frac{1}{4}$" (33·5 × 82·5 mm.)	1 hole, $1\frac{1}{2}$"Ø ; *max.*-panel = $\frac{3}{8}$" thick (39 mm.Ø ; 9·5 mm.)	$1\frac{1}{8}$" ; $1\frac{1}{2}$" with max. lamp (38 mm.)

Ratings (50 ~)	Lamps (pp. 83–85)
Carrying :—3 A. max. @ 2 V. to 1 A. max. @ 250 V. 250 V. max. P.D. across poles, and to E. 1 KV. proof test	4, 15



THESE useful bracket-Lamp-holders with Lens-bush fitting by three-tongues take 15 W. "Pigmy-Sign" Mains bulbs, or "$\frac{1}{3}$ W. Indicator Neons," with S.E.S.-Cap.

The Lens-bezels *alone*, D.645, D.646, are shown on page 82.

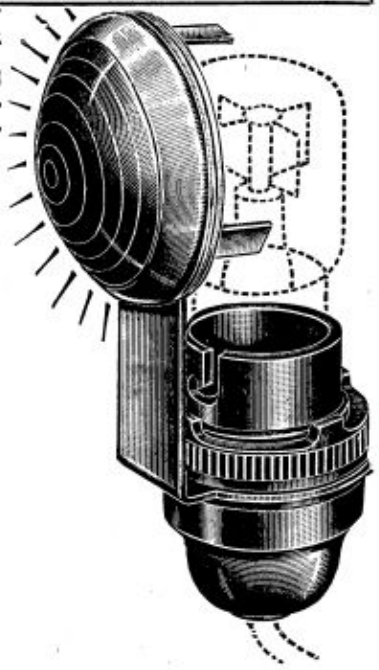


List No. with Transparent Lens-Bush	List No. with Translucent Lens-Bush	List No. *without* Lens-Bush	Connections	Panel-area occupied	Fixing Dimensions	Depth at rear
D.685/ Colour†	**D.686/ Colour**	**S.E.S. 48**	Soldering Tags	$1\frac{5}{16}$" × $3\frac{1}{4}$" (33·5 × 82·5mm.)	1 hole, $1\frac{1}{2}$"Ø ; *max*-panel = $\frac{3}{8}$" thick (39 mm.Ø ; 9·5 mm.)	$1\frac{1}{8}$" ; $1\frac{1}{2}$" with max. lamp (38 mm.)

Ratings (50 ~)	Lamps (pp. 83–85)
Carrying :—3 A. max. @ 2 V. to 1 A. max. @ 250 V. 250 V. max. P.D. across poles, and to E. 1 KV. proof test	4, 15

FITTING FOR B.C. "PIGMY SIGN" AND "INDICATOR NEON" LAMPS

A similar fitting, but having a moulded bakelite B.C. lampholder (B.22, B.S.52) to take the same size lamps, but with standard Bayonet-Cap.



List No. with Transparent Lens-bush	List No. with Translucent Lens-bush	List No. *without* Lens-bush	Connections	Panel-area occupied	Depth at rear	Fixing Dimensions
D.687 /B.C. /Colour	**D.688 /B.C. /Colour**	**B.C. 49**	Shrouded terminals	$1\frac{5}{16}$" × $3\frac{1}{4}$" (33·5 × 82·5 mm.)	$1\frac{5}{8}$" approx. (41 mm.)	1 hole, $1\frac{1}{2}$" Ø, in panel up to $\frac{3}{8}$" thick (39 mm. Ø ; 9·5 mm.)

Ratings (50 ~)	Lamps (pp. 83–85)
Carrying : —from 3 A. @ 6–12 V. to 1 A. max. @ 250 V. 250 V. max. P.D. across poles and to E. 1 KV. proof test	16, 20

† COLOUR-RANGE FOR ALL THREE TYPES :—

TRANS**PARENT** COLOURS :—Red, Amber, Green, Blue, Water-clear. (For **GLASS** Lenses, add " —/**G** " to List No.)

(With **Glass** lenses, the front projection may increase by +1 or +2 mm. approx.)

TRANS**LUCENT** COLOURS :—Red, Orange, Green, Blue, White. (No versions available in **Glass** at present.) (Avoid Green, Blue, with *Neon*-lamps.) Plastic lenses will work at up to 65° C. lens-temperature.

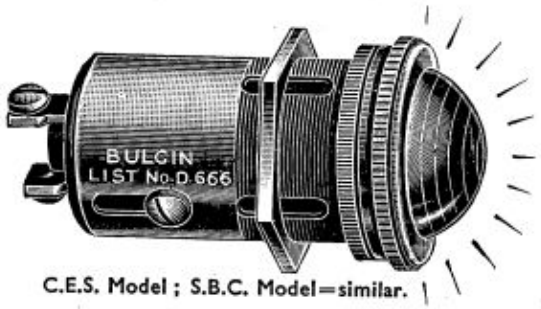
C.E.S. & B.C. SIGNAL-LAMP FITTINGS

(Small-Candelabra-Screw, E.12 Socket Size, for 100-125 v. Use)

ENCLOSED AND SPECIAL S.B.C. MODEL SIGNAL LAMP FITTINGS

A NEW Signal-Lamp Fitting for small-Candelabra and small-bayonet-Cap Lamps (see pages 83–85) for 100–115 V. working. With choice of Lenses and metal bezel, ring-nut and rear-of-panel hex.-nut ventilated aluminium-body and rear terminals. Adjustable lamp-depthing. Only supplied with glass lenses, due to lamp-heat.

For panels 18 S.W.G. to $\frac{3}{8}$", $1\frac{1}{32}$"Ø hole. Max. working V., 250 across poles (according to lamp used), 500 V. to E. Suitable lamps, types 23, 24, 25 for the C.E.S. types and 13, 31 for the S.B.C. types (pages 83–85), but use at 10 W. max. dissipation. Note : glass lenses only—plastic cannot be supplied. " /G " suffix is therefore *not* required when ordering.



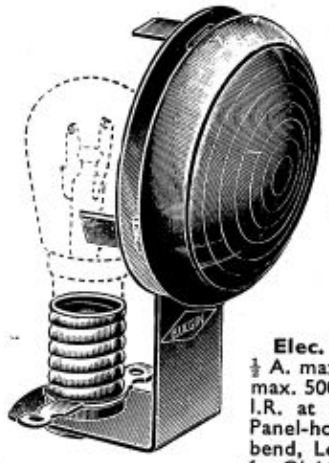
C.E.S. Model ; S.B.C. Model=similar.

List No. with E.12 (or = C.E.S. Socket)	List No. with B.15d (or = S.B.C. Socket)	Fixing hole Ø	Depth at Rear	Connections
D.666/Red D.666/Amber D.666/Green D.666/Blue D.666/Water-clear	D.666/S.B.C./Colour (Colours:—Red Amber, Green, Blue, Water-Clear)	$1\frac{1}{32}$" (26·25 mm.)	C.E.S.:—Approx. 2" (51 mm.) S.B.C.:—Approx. 2" (51 mm.)	6 B.A. clamp terminals

Elec. Ratings (working) :—2 A. max. @ 6–12 V., or $\frac{1}{2}$ A. max. @ 125 V. working P.D., 250 V. max. across poles, 500 V. max. to E. **Test** :—500 V across poles, 1 KV. to E. 1 R. @ 500 V., $\not<$ 50 MΩ dry or recovered.

OPEN, BRACKET, TYPES

TWO more types of Signal-Lamp Fittings taking Small-Candelabra (E.12) Cap Lamps. With either tags or terminals for connections, and including D.645 or 646 Lens-Bushes. With rolled-thread E.12 size shell, and resilient centre-contact, both heavily SILVER-plated (tags also, for easy soldering, in C.E.S.48), and highest grade insulation. Bezels finished highly polished chromium-plated. Plastic Lenses must not be allowed to exceed 65° C. temperature.

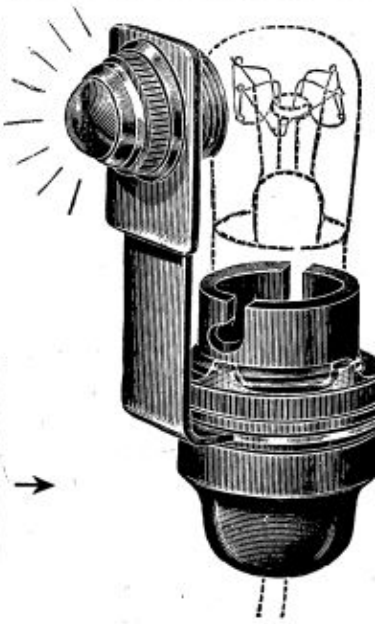


TRANS**PARENT** COLOURS :—**Red, Amber, Green, Blue, Water-clear,**
(For **GLASS*** Lenses, add " —/**G** " to List No.)
TRANS**LUCENT** COLOURS :—**Red, Orange, Green, Blue, Water-Clear.**
(No versions available in **GLASS**, at present.)

List No. with Trans-**parent** Lens-Bush	List No. with Trans-**lucent** Lens-Bush	List No. *without* Lens-Bush	'Panel-area' occu-pied	Fixing Dimen-sions	Depth at rear	Con-nec-tions
C.E.S.130/Colour	C.E.S./131 Colour	C.E.S.48	$1\frac{5}{16}$" × $2\frac{7}{8}$" (33·5 × 73 mm.)	1 hole, $1\frac{1}{8}$"Ø ; max. panel = $\frac{3}{8}$" thick (38mm.Ø; 9·5 mm.)	$1\frac{1}{2}$" (32 mm.)	SILVER-plated Solder Tags
C.E.S.132/Colour	C.E.S.133/Colour	C.E.S.49				6 B.A. Termi-nals

Elec. Ratings (Working) :—2 A. max. @ up to 12 V., $\frac{1}{2}$ A. max. @ 125 V. Working P.D. :—250 V. across poles, max. 500 V. to E. **(Test)** :—500 V. across poles, 1 KV to E. I.R. at 500 V., $\not<$ 50 MΩ, dry or recovered, $\frac{3}{8}$" max. Panel-hole required $1\frac{1}{8}$" Ø. Note 3-tongue fixing, twist or bend, Lenses are plastic normally; add " /**G** " to List No. for GLASS Lenses.

Recommended lamps to use:—23, 24, 25, p. 85.



OPEN, BRACKET, TYPE WITH MOULDED B.C. HOLDER

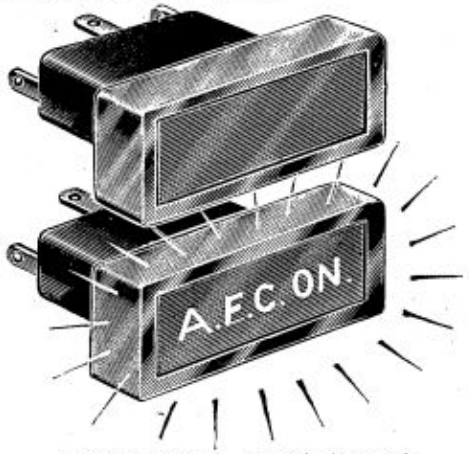
A NEW type, similar to that at foot of p. 77, but to take $\frac{3}{4}$" Ø bush. Lens-Bushes from pp. 81–82. When ordering, state Lens-Bush and colour chosen; remember: plastic lenses may not exceed 65°C. Suitable Lamps (p. 48): 16, 20.

List No.	*Add* Lens Bush No. & Colour of any $\frac{3}{4}$"Ø-bush type on pp. 81, 82. E.G.: "BC50/D.380/Red"	Con-nexions	Panel Area Occupied	Depth at rear	Fixing
B.C.50/→ (without lens bush)		Shrouded Terminals	$1\frac{5}{16}$" × $3\frac{1}{4}$" (33·5 × 82·5 mm.)	$1\frac{5}{8}$" (41 mm.) APPROX.	one $\frac{3}{4}$"Ø (16·4 mm.Ø) hole (max. panel thickn's see Lens-Bushes)

SIGNAL-LAMP HOLDERS

& PILOT-LAMP HOLDERS, M.E.S. & L.E.S.

THESE new signal Lamp fittings each use two bulbs, for even-spread illumination of LEGEND (in filter colour on black ground), which is invisible except when lit. With moulded-phenolic body; 2-hole fixing to panel, concealed by polished chromed, snap-on-bezel. *Ag.*-plated rear tags for connexion (3, for *series* or *parallel*). A choice of Legends is offered; other, special, legends can be had to order (cost proportionate to quantity). These are modern, efficient fittings, suitable for all classes of apparatus and equipment. Max V. across poles, 50 wkg., 250 test; max. V. to panel, 500 wkg., 2K. test (~ rating).



List Nos. D.720/–, D.721/–,/ Legend

FIXING, ETC., DETAILS:—

List No.	Panel Area	Panel hole	Fixing holes	Panel thick.	Closest repeat crs.
D.720 type	$1\frac{3}{4}$″ × $\frac{23}{32}$″ (44·4mm. × 18·2mm.)	$1\frac{3}{16}$″ × $\frac{21}{64}$″ (30·15mm. × 8·3mm.)	2, 6 B.A. clear, @ $1\frac{25}{64}$″ crs.	No limit	$1\frac{13}{16}$″ × $\frac{25}{32}$″ (46mm. × 19·8mm.)
D.721 type	$1\frac{21}{64}$″ × $\frac{1}{2}$″ (33·7mm. × 12·7mm.)	$\frac{13}{16}$″ × $\frac{13}{32}$″ (20·6mm. × 10·3mm.)	2, 8 B.A. clear, @ 1″ crs.	No limit	$1\frac{25}{32}$″ × $\frac{9}{16}$″ (35·3mm. × 14·3mm.)

COLOUR AND LEGENDS, ETC., DETAILS:—

List No.	*Add* Filter Colour	Internal sockets	Max. *total* watts	*Add* Legend	Lamps (pp. 83–85)
D.720/ Colour/ Legend	Red, Amber, Green, Blue, Water-clear	M.E.S., B.S.98/ E.10	2·5*	e.g.: SERVO GROUP 2 FAN ON RELOAD ENGAGED WAIT ENTER STOP GO	5
D.721/ Colour/ Legend		L.E.S., B.S.98/ E.5	2·0*		22

*Subject to working temperature of fitting NOT EXCEEDING 65°C.

MINIATURE SIGNAL-LAMP FITTINGS FOR "LILLIPUT" LAMPS, L.E.S.-CAP

List No. L.E.S.1/1

THIS COMPACT miniature-all-moulded Signal-lamp has been added to the BULGIN range to cater for all users who wish to incorporate a small Visual Signalling or warning device in equipment that is too small to carry normal components, or where space is at a premium, Completely Splash-proof, and available without Lens-cap, or with a choice of five different coloured *translucent* plastics "Caplenses," max. working temperature 65° C. L.E.S. internal socket to B.S. 98/E.5 (*Lilliput* **E***dison* **S***crew*) for 25 V. max., 1A. max., 1W. max., working; and 100 V. = max. test between poles. To E., max. working 250 V. ≃ Max. test, 500 V. =. Both these **L**illiput **E**dison **S**crew fittings are fitted with silvered tag-ends for reliable soldering.

List No. D.675/1/Colour

List No.	Panel data: Hole Ø	Panel data: Max. Thickn's	Front Ø	Front Proj'n.	Max. Rear Proj'n.	Lamp Recommended (p. 85)
L.E.S.1/1	$\frac{3}{8}$″	$\frac{5}{16}$″	$\frac{17}{32}$″	$\frac{17}{32}$″	$\frac{3}{8}$″ min.	21, 22
D.675/1 /Colour†	9.52 mm.	8 mm.	13.5 mm.	13.5 mm.	$\frac{21}{32}$″ max.	21, 22

†Only translucent colours:—Red, Green, Orange, Blue, White (No *glass* lens-caps available); do not exceed 65 °C. working.

LILLIPUT E.S. PILOT LAMP HOLDERS

AMONG the most recent developments is this entirely New Series of "**L**illiput **E**dison **S**crew" pilot-lamp holders, complete with miniature brackets *not* 'live' to poles; two solder-tags fitted. Manufactured to the same high standards as their M.E.S. (*now* "*big*") companion models, and conform to B.S. 98/E.5.

List No.	Fixing Dimensions
L.E.S.22	No bracket
L.E.S.4	2 × ·116″ Ø @ $\frac{21}{64}$″ crs.
L.E.S.133	2 × ·116″ Ø @ $\frac{11}{16}$″ crs.
L.E.S.102	Spring-clip into slots $\frac{1}{10}$″ minimum width

List No.	Fixing Dimensions
L.E.S.14	2 × ·116″ Ø @ $\frac{15}{32}$″ crs., starting $\frac{15}{32}$″ from Socket centre
L.E.S.6	2 × ·116″ Ø @ $\frac{15}{32}$″ crs.
L.E.S.18	Drill one $\frac{3}{32}$″ Ø hole in max. thickness $\frac{1}{32}$″, to accept RUBBER GROMMET. (Note: No Bracket.)

Illustrations approx. actual size.

SPECIAL SIGNAL-LAMP HOLDERS

These Fittings can be specially made in ' Tropical ' versions (add " **T**/ " to List No.), or to special specifications such as R.C.S.1000, to quantity orders.

SPECIAL SIGNAL-LAMP HOLDERS

All these holders may test @ 2 KV. to panel, and work @ ≯ 250 V. to panel; test @ 1 KV. across poles (*except* 'D.721' and work @ up to 100 V. across poles.

M.B.C. PANEL LAMP HOLDER WITHOUT LENS

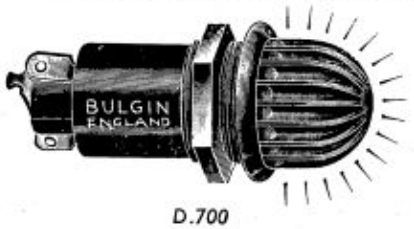
A USEFUL moulded-phenolic insulation panel-mounting lamp-holder (no lens cap), with socket: 'M.E.S.' or 'M.B.C.' ('M.C.C.'). Solder tags for connexions. With fixing nut. Takes filament or neon lamps. BODY-moulding normally BLACK, but other colours to *quantity* order. Ag.-plated solder-tags.

D.621

List No.	Socket	Panel-hole, ∅	Max. panel	Choice of Lens-Colours	Lamp Choice (pp. 83 85)
D.621/ M.B.C.	B.S.52/ B.A.9s	17/64" (17·1mm.)	9/32" (7·2mm.)	*NO* Lens	2, 6, 8, 10, 11, 18, 27, 30
D.621/ M.E.S.	B.S.98/ E.10				1, 5, 7, 9, 19, 28, 29

M.E.S. PANEL-LAMP HOLDER WITH LENS

A SIMILAR item to above, but with wide-angle, screw-in, moulded, transparent plastic flutes 'Lens'-cap (*no glass version available*). Keep lamp-Watts down, to lens temperature ≯ 65°C. (incl. any other heating of lens). State Lens-colour.



D.700

D.700/ M.B.C./ Colour	B.S.52/ B.A.9s	17/64" (17·1mm.)	9/32" (7·2mm.)	Red, Amber, Green, Blue, Water-clear (*Avoid* green, blue, with neons)	2, 6, 8, 10, 11, 27, 30
D.700/ M.E.S./ Colour	B.S.98/ E.10				1, 5, 7, 9, 28, 29

M.B.C. PANEL LAMP HOLDER WITH LENS AND BEZEL

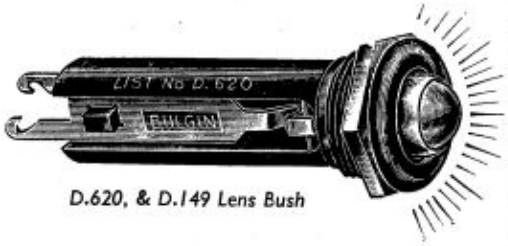
ANOTHER similar item, with non-fluted domed 'Lens', normally plastic (≯ 65°C.) but glass to order (see footnote). The Lens-cap is secured by moulded bezel-ring, black (colours, to quantity orders), or metal (add "-/**M**" to List No.).

D.655

D.656/ M.E.S.	E.10	17/64" (17·1mm.)	9/32" (7·2mm.)	*transparent:* Red, Amber, Green, Blue, Water-clear	1, 5, 7, 9, 28 29
D.656/ M.B.C.	B.A.9s				2, 6, 8, 10, 11, 27, 30
D.655/ M.E.S.	E.10			*translucent:* Red, Yellow, Green, Blue, White	1, 5, 7, 9, 28, 29
D.655/ **M.B.C.**	B.A.9s				2, 6, 8, 10, 11, 27, 30

TELEPHONE TYPE SIGNAL-LAMP FITTING

THIS useful fitting takes the flat-side-contact "telephone-jack-lamps" ('P.O. No. 2'), for 2–50 V. at various currents, see type 14, p. 84. All-moulded in phenolic, thermo-setting, it has higher insulation than most 'jack-lamp-holders': *test*–1 KV. across poles, 2 KV. to panel; *working*—250 V. across poles (50 V. lamps with series-Ω added), 1 KV. to panel.

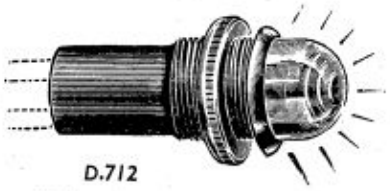


D.620, & D.149 Lens Bush

List No.	*Add* List No. of Lens-cap, D.149 &c., page 81	Panel hole, ∅	Max. Panel	Notes: Integral solder tags, nickel-silver. Use glass-lens versions of D.149 type lens-bushes if lens-temp. will exceed 65°C. (= top limit for plastic)
D.620		17/64" (17·1mm)	9/32" (7·2mm.)	

NEW PANEL SIGNAL LAMP WITH INCLUDED NEON AND RESISTOR

A NEW fitting, for mains-voltages, all-moulded in thermo-plastic (max. use temperature, 65°C.) with plastic transparent Lens-cap, and 6" leads for connexions. Very low consumption (under 1mA.) and very long life.


D.712

List No.	*Add* Lens Colour	Supply Volts, ≅	Panel-hole, ∅	Max. Panel	Colour Code, identification
D.712/ 110 V	Trans-parent:– Water-clear, OR red	100–125 V.	33/64" (13.1mm.)	13/32" (10.3mm.)	Black Leads
D.712/ 250 V.		200–250 V.			Red Leads

*** Plastic** Lenses will work at up to 65° C. lens-temperature, and are generally standard. **GLASS LENSES** can be supplied if specially requested, at extra cost (with **Glass** lenses, the front projection may increase by +1 or +2 mm. approx.). STOCK COLOURS: RED, GREEN, BLUE, AMBER, COLOURLESS, in CLEAR-TRANSPARENT. When ordering add "/**G**" to List No., and specify colour and finish very clearly.

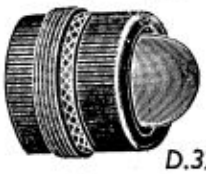
Glass lenses in DOUBLE-FROSTED, to counterpart trans*lucent* plastic lenses, are not stocked, and can only be supplied to special quantity order, or by arrangement, for **D.655** and **D.149** above, *ONLY*.

LENS AND BUSHES FOR USE WITH SEPARATE LAMP-HOLDERS

THESE useful ' Lens '-Bush fittings provide brilliant panel-windows for rear-fixed lamps in separate holders—types on pages 52–63 may be used. All have plastic type moulded 'lenses' for working at 65° C. max. and highly-plated chromed bezel, except D.320, etc., D.66, etc., which are moulded *black* bakelite plastic bezel normally. (Special metal finishes and/or glass lenses, *only to quantity orders.*) D.157, etc., and D.640, etc., have no limit to rear lamp size. For D.387, 380, 320, 410, 66, 400, *but* with chromed front bezel, add suffix " **M** " to List No.

D.151 &c., D.725 &c.

D.387 &c.



D.320 &c.

D.66 &c.

D.626 &c.

D.397 &c.

D.197 &c.

NEW SECRET-COLOUR SIGNAL-BUSHES

THESE New Signal Bushes all have colourless, frosted, front lens, but colour-disc filter behind. Un-lit, no colour-showing is possible even in strong front sunlight, but bright colour-signal when lit from behind, avoiding false signalling. Max. wkg. temp. 60° C.

List No.	Add COLOUR choice when ordering	Fixing Dim.	Bush Bore ∅	Front access to bulb	Panel thick-
D.725/Colour →	RED; YELLOW; GREEN; BLUE	1 hole, 0.343" ∅	8·5mm.	No	0·2 min.

COLOURED-LENS SIGNAL-BUSHES

LIST NOS., ADD COLOUR OF LENS REQUIRED

List No. TRANSLUCENT (see below)	List No. TRANSPARENT (see below)	Fixing Dims.	Bush Bore ∅	Front access to bulb	Panel thick-ness
D.151	**D.149**	1-Hole 0 343"∅	8·5 mm.	No	0·2" min.

The above items are similar to " P.O." Model, especially when with glass lens ; e.g., " D.149/RED/G."

D.387	**D.380**	1-Hole ¾"∅ *	11·5 mm.	Yes	$\frac{1}{16}$" max.
D.320	**D.410**	1-Hole ¾"∅ *	14 mm.	Yes	$\frac{3}{16}$" max
D.66	**D.400**	1-Hole ¾"∅ *	14 mm.	Yes	⅜" max.
D.626	**D.625**	1-Hole 1 $\frac{1}{32}$"∅	24 mm.	Yes	⅜" max.
D.397	**D.390**	1-Hole ·625"∅	13 mm.	No	⅛" min.
D.197	**D.190**	1-Hole ⅜"∅	7 mm.	No	$\frac{5}{32}$"max.

TRANSLUCENT

'Lenses' are available in RED, ORANGE, GREEN, BLUE, WHITE ; add desired colour to List No. e.g., **D.66/White**

TRANSPARENT

'Lenses' are available in RED, AMBER, GREEN, BLUE, WATER-CLEAR ; add desired colour to List No. e.g., **D.400/Water-clear**

Plastic Lenses will work at up to 65° C. lens-temperature, and are generally standard. **GLASS LENSES** can be supplied if specially requested, at extra cost. (With **Glass** lenses, the front projection may increase by +1 or +2 mm. approx.) STOCK COLOURS: RED, GREEN, BLUE, AMBER, COLOURLESS, in CLEAR-TRANSPARENT. When ordering, add "/**G**" to List No., and specify colour and finish very clearly.

Glass Lenses in DOUBLE-FROSTED, to counterpart translucent plastic lenses, are not stocked, and can only be supplied to special quantity order, or by arrangement.

[P.T.O. for further types

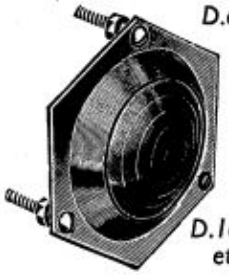
SIGNAL-BUSH FITTINGS

(*Continued from preceding page.*)

D.317, etc.

D.103, etc.

D.665



D.162 etc.

D.646

D.701, 704

D.702, 705

D.703, 706

LIST NOS., ADD COLOUR OF LENS REQUIRED

List No. TRANSLUCENT (see below)	List No. TRANSPARENT (see below)	Fixing Dims.	Bush Bore ∅	Front access to bulb	Panel thickness
D.317	**D.310**	1-Hole $\frac{3}{4}$"∅	14 mm.	Yes	$\frac{1}{16}$"max.
D.103	**D.62**	1-Hole $\frac{3}{4}$"∅	14 mm.	Yes	$\frac{3}{8}$" max.
NO TRANSLUCENT TYPES AVAILABLE	**D.665**	1 hole $\frac{3}{4}$" ∅	14 mm.	Yes	$\frac{3}{8}$" max.
D.162	**D.157**	$\frac{7}{8}$"∅ hole, 3 holes 8 B.A. clear, equi-spaced on 1 $\frac{7}{16}$" p.c.d.	—	No	$\frac{3}{8}$" max.
D.646	**D.645**	1 Hole 1$\frac{1}{2}$"∅	—	No	$\frac{3}{8}$" max.

(*Glass* lenses not available for D.665)

TRANSLUCENT

'Lenses' are available in RED, ORANGE, GREEN, BLUE, WHITE; add desired colour to List No. e.g., **D.317/White**

TRANSPARENT

'Lenses' are available in RED, AMBER, GREEN, BLUE, WATER-CLEAR; add desired colour to List No. e.g., **D.310/Water-Clear**

Plastic Lenses will work at up to 65° C. lens-temperature.
(See note on foot of previous page.)

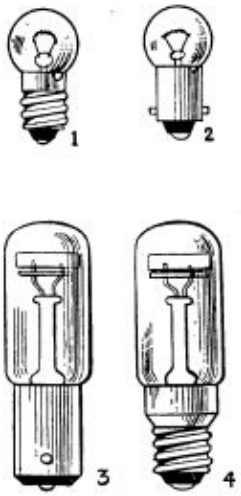
NEW POLYSTYRENE LENS IN 3 SIZES

ONE-PIECE all-moulded in brilliant Polystyrene, with highly-plated ring-nut for fixing. These new BULGIN Signal-Lens-Bushes are available in three different sizes, each in a choice of five different brilliant transparent or translucent colours. Maximum working temperature, 50°C. (from *all* sources of heating).

List No.	Lens dia.	Bush dia.	Overall depth	Colours
		TRANSLUCENT LENS		
D.704	1 $\frac{3}{16}$"	1 $\frac{1}{32}$"	$\frac{17}{64}$"	Usual range (*Red, Green, Blue, Orange, White*) Translucent.
D.705	$\frac{21}{32}$"	$\frac{3}{4}$"	$\frac{5}{8}$"	
D.706	$\frac{19}{32}$"	$\frac{11}{32}$"	$\frac{9}{16}$"	
		TRANSPARENT LENS		
D.701	1 $\frac{3}{16}$"	1 $\frac{1}{32}$"	$\frac{17}{64}$"	Usual range (*Red, Green, Blue, Amber, Water-clear*) Transparent.
D.702	$\frac{21}{32}$"	$\frac{3}{4}$"	$\frac{5}{8}$"	
D.703	$\frac{19}{32}$"	$\frac{11}{32}$"	$\frac{9}{16}$"	

FOR USE WITH BULGIN SIGNAL-LAMPS AND HOLDERS ON PRECEDING PAGES

AVOID USING NEON-LAMPS BEHIND BLUE OR GREEN LENSES



★ Data on page 84

ON this page and pages 84, 85 we detail types of actual lamps which can be bought through usual supply channels, and used with BULGIN Signal-Lamp-Fittings. The listing is in order of actual lamp itself, showing what Bulgin Fittings are typical to be used : you have, or have chosen, your lamp, and seek a holder. On the preceding pages of Signal-Lamp-Fittings and Holders, the order is reversed ; you choose a BULGIN Signal-Lamp-Holder first, then look up suitable lamps for it. The caps of the lamps are detailed M.E.S., M.B.C., etc., in the usual *standard* abbreviations. WE REGRET THAT WE CANNOT SUPPLY THESE ACTUAL LAMPS, WHICH MUST BE BOUGHT THROUGH USUAL LAMP-SUPPLY CHANNELS. Typical Lamp-manufacturers are mentioned below, *not necessarily exhaustively*. Different Makers' Lamps may vary as to exact V., A., W., within the extreme figures we give ; please check *Lamp-data* with *Lamp-makers*, if necessary, and please check if you need any series-resistor, as most uses of Neons do. Please also bear in mind that if Lamp-heat (and any other heating) will raise lens-temperature above 65° C., you need fittings with GLASS lenses.

Illus. No.	Volts, Amps., Max. Watts (V.)	(A.)	(W.)	Cap, and Nominal Bulb ∅	Typical Makers	Use in BULGIN Signal-Lamp-Holders Nos. :—(The heavy-type figures in brackets are the relative Page Nos. in this Catalogue)
1	2–24	0·06 –0·5	—	M.E.S., 15 mm.∅	Atlas, Crompton *Mazda* and Ediswan, Ever-Ready, Luxram, G.E.C. (Osram), Philips, Siemens, Vitality, Lucas, Stella, Cryselco, etc. *for both types*	All " M.E.S." **(54, 58, 59)** ; D.7 **(70)** ; D.78 **(75)** ; D.630 **(64)** ; D.636 **(80)** ; D.681 **(65)**
2	2–24	"	—	M.B.C. (M.C.C.) 15 mm.∅		All " M.B.C." **(55–57)** ; D.7/M.B.C. **(70)** ; D.133 **(75)** ; D.630/M.B.C. **(64)** ; D.681/M.B.C. **(65)**
3	200–250 **	—	0·5	S.B.C.* 0·5 W. "Indicator Tubular Neon "†	G.E.C. (Osram), Philips,‡ Siemens, Ediswan, Atlas, Mazda	All " S.B.C." **(62, 63)** ; D.84 **(76)**
4	" **	—	"	S.E.S., ditto †		All " S.E.S." **(61)** ; D.54 **(75)** ; S.E.S.48 **(77)** ; S.E.S.49 **(77)**
5	2–24	0·06 –0·5	—	M.E.S., 11 mm.∅	Atlas, Crompton *Mazda* and Ever Ready, Luxram, G.E.C. (Osram), Philips, Siemens, Vitality, Lucas, Stella, Cryselco, etc. *for both types*	All " M.E.S." **(54, 58, 59)** ; D.7 **(70)** ; D.9 **(73)** ; D.9/1 **(73)** ; D.45 **(72)** ; D.45/1 **(72)** ; D.49 **(72)** ; D.78 **(75)** ; D.109 **(73)** ; D.170 **(70)** ; D.200 **(73)**; D.250 **(73)** ; D.350 **(69)** ; D.360 **(81)** ; D.370 **(69)** ; D.580 **(69)** ; D.590 **(69)** ; D.630 **(64)** ; D.636 **(80)**; D.662 **(75)** ; D.681 **(65)** ; D.720 **(79)**
6	2–50	"	—	M.B.C. (M.C.C.), 11 mm.∅		All " M.B.C." **(55–57)** ; D.7/M.B.C. **(70)** ; D.49/M.B.C. **(72)** ; D.109/M.B.C. **(73)** ; D.133 **(75)** ; D.170/M.B.C. **(70)** ; D.360/M.B.C. **(71)** ; D.590/M.B.C. **(71)** ; D.630/M.B.C. **(64)**; D.662/M.B.C. **(74)** ; D.270/M.B.C. **(71)** ; D.681/M.B.C. **(65)**
7	"	"	—	M.E.S., 12-13 mm. ∅	Atlas, Osram, Mazda, Ever-Ready, Luxram, Siemens, Vitality, Lucas, Stella, etc.	All " M.E.S." **(54, 58, 59)** ; D.7 **(70)** ; D.78 **(75)** ; D.170 **(70)** ; D.630 **(64)** ; D.636 **(80)** ; D.681 **(65)**
8	"	"	—	M.B.C. (M.C.C.), 12-13 mm. ∅		All " M.B.C." **(55–57)** ; D.7/M.B.C. **(70)** ; D.49/M.B.C. **(72)** ; D.133 **(75)** ; D.170/M.B.C. **(70)** ; D.630/M.B.C. **(64)** ; D.681/M.B.C. **(65)** ; D.109/M.B.C. **(73)**
9	2–24 ††50	0·15 –0·3 0·05	— 2·5	M.E.S.; 10 mm.∅ × 18 mm. Glass envelope size	Luxram, Philips, Siemens, Vitality, Lucas, Mazda, Cryselco, Atlas, etc.	All " M.E.S." **(54, 58, 59)** ; D.7 **(70)** ; D.45 **(72)** ; D.49 **(72)** ; D.78 **(75)** ; D.170 **(70)** ; D.250 **(73)** ; D.330 **(69)** ; D.340 **(69)** ; D.360 **(69)** ; D.370 **(69)** ; D.630 **(64)** ; D.636 **(80)** ; D.662 **(74)** ; D.670 **(67)** ; D.700 **(80)**

* S.B.C., Double Contact only; this lamp *not* made with S.C.C. Cap, for reasons of working voltage. † Lamp-cap contains series resistor ; state mains V. when ordering Lamp. ‡ Philips can supply Fluorescent : *red, green, amber* ; use with water-clear lenses, see Illustration No. 26. ** These lamps contain series-resistors, in Caps. ††Believed to be manufactured by VITALITY only.

[continued overleaf

RECOMMENDED TYPES OF LAMPS

FOR USE WITH BULGIN SIGNAL-LAMPS AND HOLDERS ON PRECEDING PAGES

(continued from previous page)


13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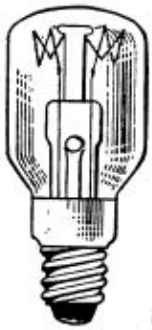
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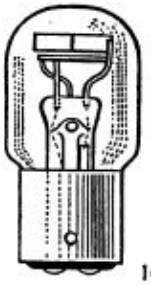
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Illus. No.	Volts, Amps., Max. Watts (V.)	(A.)	(W.)	Cap and Bulb Ø	Makers	Use in BULGIN Signal-Lamp-Fittings and Holders Nos. :—(The heavy-type figures in brackets are the relative Page Nos. in this Catalogue)
10 (Page 83)	2–24	0·15 –0·3	—	M.B.C. (M.C.C.); 10 mm.Ø × 18 mm. Glass envelope size	G.E.C. (Osram), Luxram, Philips, Siemens, Vitality, Lucas, Cryselco, Stella, Atlas, etc.	All " M.B.C." (**55-57**) ; D.7/M.B.C. (**70**) ; D.49/M.B.C. (**72**) ; D.133 (**75**) ; D.340/M.B.C. (**71**) ; D.360/ M.B.C. (**71**) ; D.621 (**80**) ; D.630/ M.B.C. (**64**) ; D.655 (**80**) ; D.662/ M.B.C. (**74**) ; D.681/M.B.C. (**65**)
	§§50	0·05	2·5			
11 (Page 83)	60-70, *or* 180, and up*	—	very small	M.B.C. (M.C.C.)	G.E.C. (Osram), Hivac, Atlas	All " M.B.C." (**55-57**) ; D.7/M.B.C. (**70**) ; D.133 (**75**) ; D.170/M.B.C. (**70**) ; D.340/M.B.C. (**71**) ; D.360/ M.B.C. (**71**) ; D.621 (**80**) ; D.630/ M.B.C. (**64**) ; D.655 (**80**) ; D.662/ M.B.C. (**74**) ; D.681/M.B.C. (**65**)
12 (Page 83)	"	—	"	S.E.S.,* Type " F " or " Button " Neon	G.E.C. (Osram), Stella, Atlas	All " S.E.S." (**61**) ; D.58 (**75**) ; D.680 (**65**)
13	6, 12,	1, ½,	3, 6	S.B.C.† or S.C.C.‡ car side or rear bulbs	Atlas, Luxram, Cryselco, Crompton & as above	All " S.B.C." (**62, 63**) ; D.220 (**76**) ; D.666/S.B.C. (**78**)
	24	½				
14	4 6, and up to 50	Various Ratings		" Jack-lamp " or 'P.O. No. 2' telephone lamp. (To B.S. 1050.)	Atlas, Luxram, G.E.C. (Osram), Ediswan. Hivac, Mazda, Siemens, etc.	D.620 (**80**)
15 ††	200–250	—	15	15 W. Pigmy-Sign lamp with S.E.S. cap	All as (3) page 81, also Mazda, Luxram, Crompton, Ismay, Philips	All " S.E.S." (**61**) ; S.E.S. 48, 49 (**77**)
16	200–250 **	—	0·5	B.C.**	G.E.C. (Osram) Cryselco, Stella, Atlas, Mazda, Philips	D.650 (**68**); D.680/B.C. (**77**); B.C.49 (**77**); B.C.50 (**78**)
17	24	—	3–5	M.B.C. (M.C.C.)	Hivac Mazda	All " M.B.C." (**55, 57**) ; D.7/M.B.C. (**70**) ; D.133 (**75**) ; D.170/M.B.C. (**70**) ; D.340/M.B.C. (**71**) ; D.630/ M.B.C. (**64**)
	or 50	—	3–5			
18	50 (" Teleprint Lamp ")	60 mA.	3	M.B.C. (M.C.C.) Mazda: 24 v., 0·1 A.,	Metrovick Hivac Vitality, Mazda	All " M.B.C." (**55, 57**) ; D.7/M.B.C. (**70**) ; D.133 (**75**) ; D.170/M.B.C. (**70**) ; D.270/M.B.C. (**71**) ; D.340/ M.B.C. (**71**) ; D.360/M.B.C. (**71**) ; D.630/M.B.C. (**64**)
	& :–24	120	2·9	2·4 W.	Hivac, Mazda	
19	50 (" Teleprint Lamp ")	60 mA.	2·5	M.E.S. Mazda: 24 v., 0·1 A., 2·4 W.	Metrovick Hivac Vitality	All " M.E.S." (**54, 58, 59**) ; D.7 (**70**) ; D.78 (**75**) ; D.170 (**70**) ; D.270 (**69**) ; D.340 (**69**) ; D.360 (**69**) ; D.630 (**64**) ; D.682 (**65**)
	& :–24	120	2·9		Hivac, Mazda	
20	100–120, 200–250	—	15	B.C. 28 mm.	As 15 above§	D.650 (**68**); D.687/B.C. (**77**); B.C.49 (**77**); B.C.50 (**78**)

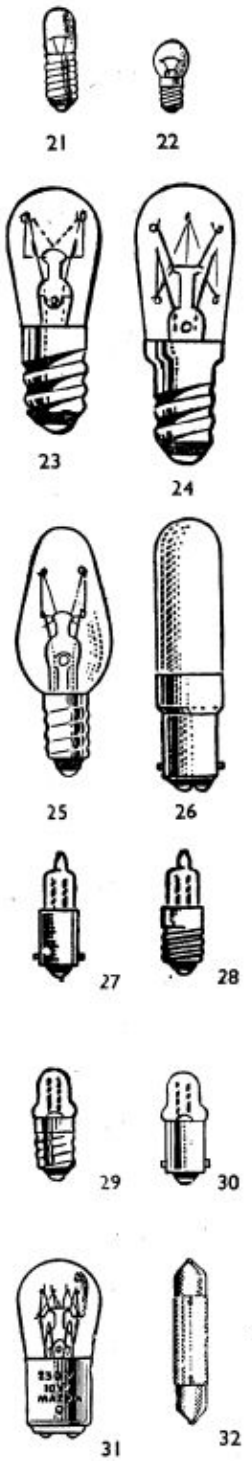
* External Series Resistor essential in most uses ; follow Lamp-Manufacturer's instructions on value. † Double Contact, ‡ Single Contact. *Specify which when ordering Lamp, and when ordering Fitting from us.* In Small Bayonet Caps, *double*-contact is '**S.B.C.**' and *single*-contact is '**S.C.C.**'

** Lamp Cap contains series resistor ; state mains V. when ordering Lamp. Atlas, Stella and Philips can supply these lamps with a fluorescent coating inside the envelope, if required.

†† This lamp may also be had with S.B.C. cap (for all holders on page 62, 63 (**S.B.C.**, only)), or with B.C. cap, for holders as lamp type **16**.

§ Philips can supply Neon : Fluorescent : *red, green, amber;* use with water-clear lenses. Also, for 75 V. and up.

§§ Believed to be manufactured by VITALITY only.



Illus. No.	V.	A.	W.	Cap ; & Bulb ⌀	Makers	Makers' type No.	USE IN BULGIN FITTINGS NOS.
21	1·5–24	from 40 or 60mA to 0.3A	—	L.E.S., E.5.; 5 mm.⌀ tub'r bulb	Philips, Vitality	—	All "L.E.S."; D.675/1; D.721 (79)
22	1·5–24	0·3 to 0·04 or 0·06	—	L E.S. 7·5mm. / 5·5mm.	Hivac, Philips Vitality Mazda	—	All " L.E.S." D.675, D.675/1 (79)
	12;28	—	1·5; 1·12	7mm.			
23	100–120	—	6	Small-Candelabra cap, E.12 ; ⌯ 20 mm.	Philips	'Signal' No. 7248M	All " C.E.S." (60) ; D.666 (78)
					Mazda	—	
	100–120	—	7		U.S.A. Makers	—	All " C.E.S." (78)
24	100–120	—	6	ditto cap ;	Philips	'Signal' No. 7248Z	All " C.E.S." (60) ; D.666 (78) AU " C.E.S." (78)
	100–120	—	10*		B.T.-H. 'Mazda'	††† "11G., 100–130V., –T.18, C.E.S. (E.12)"	
	100–120	—	10*	⌯ 20 mm.	Edison-Swan; Mazda	—	
	100–130	—	10*		G.E.C. 'Osram'	—	
	230‡‡	—	10*		B.T.-H. 'Mazda',‖	††† "11G., –1., 230V., –T.18–C.E.S. (E.12)"	
25	100–120	—	7	ditto cap ; ⌯ 23 mm.	U.S.A. Makers	—	All " C.E.S." (60) ; D.666 (78)
26	200 §	—	approx. 0·5	S.B.C.	Philips, Stella‡ Atlas‡	" Fluorescent Tubular Indicator Neon "	All " S.B.C." (62, 63) ; D.84 (76) ; D.290 (76)
27	60–70 and upwards **	—	Very low	M.B.C. (M C.C.)	Hivac, G.E.C.**	(Hivac) C.C.4.L.	All " M.B.C." (55, 57) ; D.7/M.B.C. (70) ; D.49/M.B.C. (72) ; D.133 (75) ; D.170/M.B.C. (70) ; D.270/M.B.C. (71) ; D.630/M.B.C. (64) ; D.662/M.B.C. (74) ; D.109/M.B.C. (73)
28				M.E.S.		(Hivac) C.C.5.L.	All " M.E.S." (54, 58, 59) ; D.7 (70) ; D.78 (75) ; D.170 (70) ; D.270 (69) ; D.630 (64); D.662 (74)
29	** ††	Neon, 0·75 mA., *max.*	½ W. nom'l.	M.E.S.	Philips, Hivac	PP.0434 C.C.10.L.	As for 28 above
30				M.B.C. (M.C.C.)	Philips, Hivac	PP.0435 C.C.5.L.	As for 27 above
31	230	—	7–10	S.B.C.	B.T.-H. 'Mazda',‖‖	††† "11G–1., 230V.,–T.18 S.B.C. (B.15/d.)"	All " S.B.C." (62, 63) D.666/S.B.C. (78)
	120	—	6	S.B.C.	Philips	7248 / W / B.15d	"
32	6 or 12	—	3	Nom'lly 35·5 mm. long × 7·5 mm. ⌀	As for type 7 page 81	See their Cat'g's.	D.693(68) (3 watts. max.)

* Wattage-rating is usually as at max. V. Some lamps may be marked 100–125 V. ; 100–130 V. ; but 120 V is max. V. (in most cases) for 10 W. max. working dissipation. Lamps working at above 120 V. may be used at such voltages, in Bulgin " C.E.S." Holders only; D 666, Holders handle only 10 W. max., and hence usually 115–120 V. is max. supply or volts across amp. Two lamps may be used in series on 200–240 V. supplies, or one with series resistor of 10–20 W. rating.

† G.E.C. (' Osram ') Low-V. ' Neons ' are generally shaped as Illustration-11, pages 83–84, *and are titled* " N.L.1/*cap.*" (*State* ' M.E.S.' *or* " M.B.C. [= M.C.C.] " *Cap* ; they have ' rod-electrodes.')

** Series-resistor essential in most uses ; work to Lamp-Manufacturers' data for value.

†† 65–500 V. A.C. or 95–500 V. D.C. State V. and " A.C." or " D.C." when ordering from lamp supplier.

††† Also made with "S.E.S.(E.14)–" Cap, usable in S.E.S., holders on *pp.* **61, 75.** ("——/G" types), **77.**

‡ Also (Atlas & Stella only) :—B.C., E.S., S.B.C., S.E.S., size Caps, as Fig. 20, all *fluorescent.*

‡‡ And see *ditto* lamp with S.B.C. Cap (" B.A.15d."), No. 31.

§ This lamp contains series resistor, in cap.

‖ Cat. No. "S.6"/E.12; ‖‖ Cat. No. "S.6"/B.15/D.

(SENSITIVE, NON-LOCKING ACTION)

BULGIN 'BASIC' MICRO SWITCHES.

THESE Micro Switches represent the finest of this class of switch. Their action is simple, yet reliable and trouble-free, and their performance is consistent and long-lived. All the internal springs are of the best hardened beryllium-copper alloy, and the heavy contacts are of pure silver. The action is precise and snappy. Operating buttons, and the cases, are of moulded thermo-setting bakelite material, black. Each model is S.P.C.-O., universal for on-off or off-on or C.-O. uses. They can be operated by light pressures (down to about 1·5 oz.) and/or movements as small as 0·015". Yet they are consistent, and can be relied on for 500,000 operations at ratings, or more. Normal Max. and Min. Sinusoidal Rates of Operation (incl. permitted 'pre-travel' and 'over-travel,' for all models on pp. 87, 88):—**FASTEST:** 1 full cycle of total drive-plus-total-retraction in 0·2 Sec. (200 mS.),=all drive in 0·1 Sec.,=5 cycles of movement (total) per Sec. **SLOWEST:** 1 full cycle in 4·0 Secs.,=total drive in 2 Secs.,=$\frac{1}{4}$c/S.

List Nos. S.500–502

Dimensions:—1$\frac{21}{64}$" × $\frac{23}{32}$", × $\frac{9}{16}$" max. height (50 mm. × 17·5 mm., × 22·75 mm. max. height). Fixing:—2 × 4 B.A. clearance holes @ 1" ± 0·005" crs. (2 × 3·8 mm. ∅ holes @ 25·4 mm. ± 0·125 mm. centres).

List Nos. S.503–505

MECHANICAL DATA

	1	2	3	4	5	6	7
	List No.	Approx. figures in INCHES				Approx. figures in OZS.	
		Contact gap	Average Pre-travel	Max. Differ-ential	Over-travel	Average Operating Pressure	Average Main-taining Pressure
Medium Pressure	S.500	0·01	0·015	0·003	0·009	9	6½
	S.501	0·04	0·017	0·010	0·009	12	5¾
	S.502	0·07	0·020	0·015	0·006	14	5
Light Pressure	S.503	0·01	0·023	0·005	0·020	3	2
	S.504	0·04	0·030	0·015	0·016	4	1½
	S.505	0·07	0·033	0·020	0·010	5	1¼

Notes.—Column 2 : Working tolerance, ± 25%. Column 3 : Subject to approx. ± 33⅓% variation. 'Pre-travel' is *all* the movement of the button before the contacts snap over. Column 4 : The normal max. figure ; 'Differential' is reversed movement to restore the contacts to the unoperated state. Column 5 : This is the max. movement allowable to users as further depression of the button after the action has snapped over. Some switches may possess more over-travel, but greater figures are not *guaranteed*.

ELECTRICAL DATA, 50~ RATINGS

1	2	3	4	5	6	7	8	9
List Nos.	Max. voltage, across open contacts	Max. voltage, to mount-ing bolts	Max. voltage, contacts to button	Carrying and Peak-breaking Amps @ V. ~				
				up to 125	130–250	260–460	470–600	110–460
S.500, S.503	800 V. (Test) 400V. (work-ing)	1,000V. (Test) 600V. (work-ing)	1,000V. (Test) 600V. (work-ing)	10 A.	5 A.	—	—	—
S.501, S.502, S.504, S.505	2,000V (Test) 600V. (work-ing)	1,000V. (Test) 600V. (work-ing)	1,000V. (Test) 600V. (work-ing)	10 A.	5 A.	3 A.	2 A.	Motors, ¼ h.p. max., direct switch-ing

For DRY conditions, at N.T. & P. De-rate for damp & L.P. states.

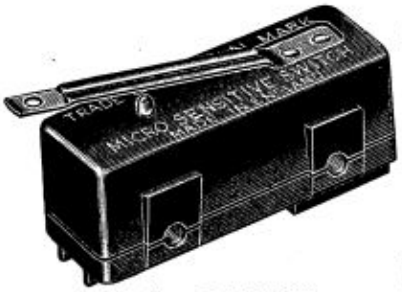
Notes.—*Cols.* 2–4, 1-minute test. *Cols* 5–9, *Making*-current may be 3 times the carrying-current if initial surge drops to normal within 10 mS. All D.C. ratings must be agreed for specific actual uses, but are 1/30th–1/100th of A.C. ratings, except below 25 or 30 V., or in high-Ω circuits.

The above are the simplest and 'basic' types of Micro-sensitive switches. They are further available, as shown in the following page 87, with 'operator'-leaf attachments, operator-leaf-with-roller attachments, and with one-hole fixing and over-travel plunger drive. In addition Miniature or 'M' models are made—see pp. 89–91.

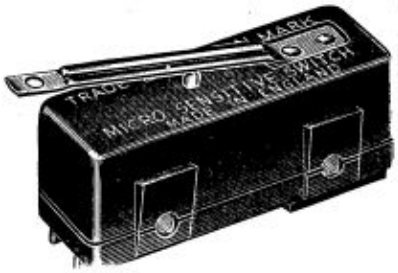
THIS further group of BULGIN Micro Switches covers the basic type (on opposite page) but with added external-leaf-'operator.' This extra fitment is made in stainless-steel spring alloy, for a working life of normal deflexions equal at least to the normal working life of the basic Switch. Some 500,000 operations is usually assured, under proper working conditions. The leaf-operator, acting as a lever, multiplies the distance of movement for operating the Switch, and slightly lessens the operating force, as well as increasing the permitted overtravel.

Dimensions : $1\frac{11}{64}$" × $\frac{33}{64}$", × $\frac{41}{64}$" max. height (50 mm. × 17·5 mm., × 25 mm. max. height).

Fixing : 2 × 4 B.A. clearance holes @ 1" ± 0·005" crs. (2 × 3·8 mm. ∅ holes @ 2·5 mm. ± 0·125 mm. centres).



List Nos. S.506–508



List Nos. S.509–511

MECHANICAL DATA

MODELS FITTED WITH EXTERNAL BLADE of stainless (spring) steel, to multiply the movement distances when operating upon tip of blade.

	1	2	3	4	5	6	7
	List No.	Approx. figures in INCHES				Approx. figures in OZS.	
		Contact gap	Average Pre-travel	Max. Differ-ential	Over-travel	Average Operating Pressure	Average Main-taining Pressure
Medium Pressure	S.506	0·01	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{32}$	4–5	2
	S.507	0·04	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{32}$	5·7	2
	S.508	0·07	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{32}$	6–8	3
Light Pressure	S.509	0·01	$\frac{1}{8}$	$\frac{1}{32}$	$\frac{1}{16}$	$1\frac{1}{2}$–3	1
	S.510	0·04	$\frac{1}{8}$	$\frac{1}{64}$	$\frac{1}{16}$	$1\frac{1}{2}$–3	1
	S.511	0·07	$\frac{1}{8}$	$\frac{3}{64}$	$\frac{1}{16}$	3–4	1

Notes.—Column 2 : Working tolerance, ± 25%. Column 3 : Subject to approx. ± 33⅓% variation. ' Pre-travel ' is *all* the movement of the button before the contacts snap over. Column 4 : The normal max. figure ; ' Differential ' is reversed movement to restore the contacts to the unoperated state. Column 5 : This is the max. movement allowable to users as further depression of the button after the action has snapped over. Some switches may possess more over-travel, but greater figures are not *guaranteed.*

ELECTRICAL DATA, 50~ RATINGS, same as for S.500–505, page 86.

Part No. 8541 (shown with List No. S.500 in-fitted but not in-fixed.)

BASE COVER AND SURFACE BASE MOUNTING ACCESSORY

FOR STANDARD BULGIN 'BASIC' MICRO-SWITCHES

THIS moulded thermosetting Bakelite Unit covers the rear terminals of standard BULGIN Micro Switches (see *pages* 86–88 *and above*), where shrouding is needed, using the same side-fixing 4 B.A. bolts ($\frac{3}{16}$" longer); or it may itself be base-fixed, the Micro Switch then fixing to this Accessory only. Ample 'knock-outs' for entry of Cables. Intending users may have 'Installation Drg.' print on request, refer to **"P/No. 8541."**

NEW OPEN-BLADE MICRO-SWITCH

AN entirely new, first-in-U.K., "open-blade" micro-switch, with the famous BULGIN rolling-spring Q.M.Q.B. action, of high electrical-rating and long working life. This open unit, S.P.C.-O., is intended to be built into apparatus, switching-equipment, etc., of all kinds, and thus enclosed. It has snappy action, pure-silver contacts, beryllium-copper springs. *O.A. dims.*: $1\frac{25}{32}$" × $\frac{11}{32}$". *Fixing:* 2 holes 6 B.A. clear, at 0·236" crs. *Elec. rating* (provisional): from 3 A. at 250 V. max., to 6 A. max. at 12 V. and less, down to 0·01 V. (min.), all A.C. (*D.C. ratings by agreement, above* 28 V.) 500 V. max. test-V. between contacts, and to Earth.

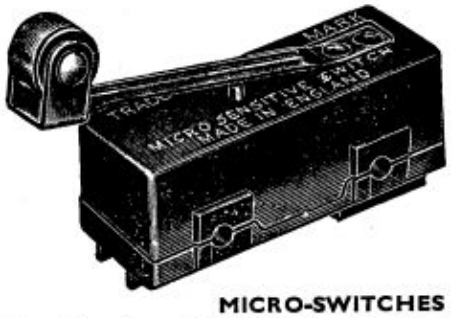
S.735–739
(D.P. Assemblies can be supplied.)

List Nos.	Action
S.735	S.P.C.-O., biased action (*self return*)
S.736	S.P.C.-O., locking action
S.737	S.P.M.-B., biased, press for "ON"
S.738	S.P.M.-B., biased, press for "OFF"
S.739	S.P.M.-B., locking action

INSTALLATION DRG. OR ADDITIONAL DETAIL DATA UPON REQUEST

WITH ROLLER ATTACHMENTS

TO increase the already numerous applications of the basic types of Bulgin-Micro-Sensitive-Switches comes this New Roller-attachment, designed to increase the varieties of the external-leaf models, List Nos. S.506–511 (p. 87). These rollers are pivoted and mounted on the leaf-end ready for use. Rollers are fully free running and obtainable in the following materials:—Nickel-plated Brass, Graphite-compound, Tufnol and Stainless-Steel. Please Note ordering details in table.



TYPE OF ROLLER	Add Suffix-Code-letters below to any List No. in the **S.506–511** range
Nickel-plated Brass Roller	**-/RB.**
Graphite-compound Roller	**-/RG.**
Tufnol type Roller	**-/RP.**
Stainless-Steel Roller	**-/RSS.**

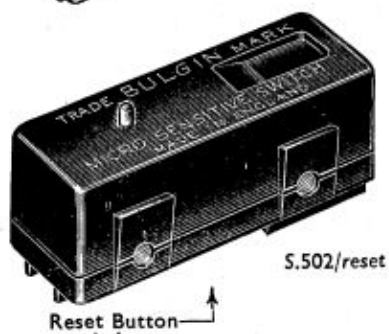
MICRO-SWITCHES WITH ONE-HOLE FIXING BUSHES

THIS useful variety of BULGIN Micro-Sensitive-Switches has one-hole fixing bush for $\frac{1}{16}$" max. panel thickness, bush — $\varnothing = \frac{13}{32}$", 32. T.P.I., supplied complete with front-of-panel knurled ring-nut, and (*essential*) rear-of-panel hex.-nut. Plunger normally with nickelled brass head ; this is changeable, for special heads *in quantity only* to any individual requirements. Full S.P.C.O. action, universal for on-off, off-on, or C.-O. elec. ratings as types S.500–502 on page 86. Mechanical data :—

S. 610–612

1	2	3	4	5	6	7	8
List No.	Approx. figures in INCHES				Approx. figures in OZS.		For Elec. data, see p. 84 under Type
	Contact Gap	Average Pre-travel	Max. differ-ential	**Total Travel**	Average Operating Pressure	Average Pressure for **Total Travel**	
S.610	0·010	0·015 to 0·030	0·003	$\frac{1}{32}$	9		S.500
S.611	0·040		0·010		12		S.501
S.612	0·070		0·030		14		S.502

Electrical data :—See types S.500, S.501, S.502, on page 86, to same units-digit in List No.

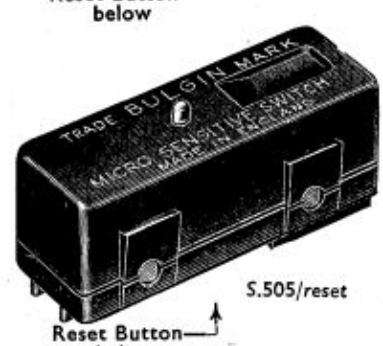


S.502/*reset*

Reset Button below

MICRO-SWITCHES WITH RESET-BUTTON IN BASE

WHILST all foregoing BULGIN Micro-Sensitive Switches have ' biased ' or ' non-locking ' action (the button and contacts returning to unstressed position as soon as pressure is removed), we can now offer two models with locking action ; return of drive button and contacts is effected by a second, " RESET," button, at base. Only after operation of the Reset-button, may the Drive-button again be depressed to re-operate the switch. Mechanical-data as below ; elec.-data as types of same List No. (without ' RESET '-suffix) on page 86.



S.505/*reset*

Reset Button below

1	2	3	4	5	6	7
List No.	Approx. figures in INCHES				Approx. figures in OZS.	
	Contact Gap	Operat-ing-Button: Average Pre-travel	Reset-Button: Max. **Total-travel**	Operat-ing-Button: Average **Total-travel**	Average Operat-ing pressure	Average Reset pressure
S.502/ Reset	0·07	0·020	$\frac{1}{32}$	0·030	6-9	$2\frac{1}{2}$-$3\frac{1}{2}$
S.505/ Reset	0·07	0·030	$\frac{1}{32}$	0·040	$2\frac{1}{4}$-$3\frac{1}{2}$	$2\frac{1}{4}$-$3\frac{1}{2}$

MINIATURE MICRO-SENSITIVE SWITCHES

(LIGHT-PRESSURE OR COIN-OPERATION TYPES)

OVER 500,000 OPERATIONS GUARANTEED

BULGIN MINIATURE or 'M'-TYPE MICRO SWITCHES

THE newest additions to the range of BULGIN Micro-sensitive switches are these **MINIATURE** Type- "M" Models. Manufactured to the usual BULGIN superlative quality and high standards and specifications, these switches are made with high grade black moulded 'Bakelite' bodies (with styrene type-colour-code covers), fitted with internal springs of hardened Beryllium-copper alloy and with heavy contacts of pure silver. Operating buttons can be of stainless steel, *specially to quantity order* or are moulded as STANDARD (for high insulation) from 'Bakelite'. The many models now available are augmentable by detachable plates to take different switching operators (see p. 90). The switching action is fully 'snap,' q.m.b., with the unique "C-spring," or rolling spring principle, and solder-tags are provided for connections, firmly anchored against direct pull, ⩾ 5 lb. test.

S.520–S.529, all /A type

S.520–S.529, all Standard *type with* ***Bakelite*** *Button*

S.530, S.532, all /A type

S.530, S.532, all Standard *type with* ***Bakelite*** *Button*

S.520–S.528 TYPES, SMALL-, MED.-, & LARGE-CONTACT-GAP CENTRE-BUTTON TYPES, FOR GENERAL USE

S.530–S.532 TYPES, SMALL-CONTACT-GAP & VERY LIGHT PRESSURE END-BUTTON TYPES (Suitable for coin-operation)

MECHANICAL DATA

1		1a	2	3	4	5	6	7
List No. with Bakelite Button STANDARD	List No. with Stainless-Steel Button†	Colour Code	Nominal Contact Gap	Average Pre-travel	Max. differential	Over-travel, MAX.	Average Operating Pressure	Average Release Pressure min.
S.520	—	Red	0·01″	1/32″	0·015″	0·025″ (For longest life, limit to 0·010″)	3–6 oz.	¾ oz.
S.521	—	Yellow			0·015″		6–10 oz.	3 oz.
S.522	—	Green			0·020″		10–16 oz.	4 oz.
S.524	—	Yellow	0·02″	1/32″	0·015″		6–10 oz.	3 oz.
S.525	—	Green			0·020″		10–16 oz.	4 oz.
S.527	—	Yellow	0·03″	1/32″	0·020″		6–10 oz.	3 oz.
S.528	—	Green			0·030″		10–16 oz.	4 oz.
S.530	—	Red	0·01″	0·055″	0·030″	0·050″ preferably 0·025″	gms. 25–50	15 gms.
S.532	—	Green					50–100	38 gms.

†only made to order, if essential.

MAX. ELECTRICAL DATA, @ 50 ~

List Nos.		Making, carrying & Peak-breaking A. @ Up to 12 V. ~ ⎓	@ 13 to 125 V. ~	@ 125 to 250 V. ~	R.M.S. Working V. Across Contacts ; Contacts to E.	R.M.S. Proof Test V.* Contacts to drive means	Between contacts & Contacts to E.	Contacts to drive means
S.520 to S.528	/A	6 A.	6 A.	3 A.	250 V.	250 V.	500 V.	500 V.
	STANDARD					500 V.		1 KV.
S.530 to S.532	/A	4 A.	3 A.	1·5 A.	250 V.	250 V.	500 V.	500 V.
	STANDARD					500 V.		1KV.

* I.R. is taken @ 500 V. = (i.e., D.C.), for ⩽ 100MΩ dry or recovered.

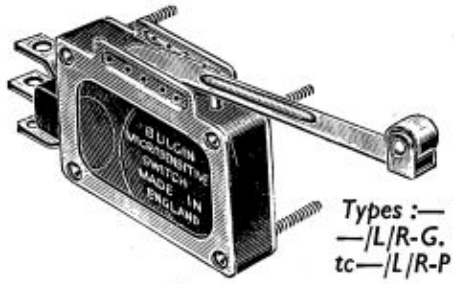
† **Specially, to quantity order only. The BAKELITE Button type, with its higher insulation, is now the STANDARD.**

Every model has S.P.D.T. contacting, and so is *universal* for ON-OFF, OFF-ON, or CHANGE-OVER, giving minimum stocking.

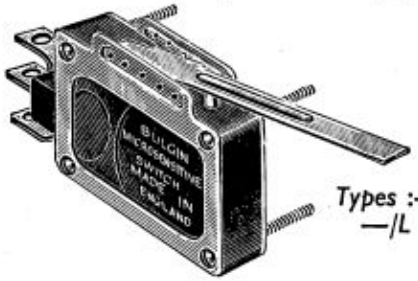
Normal Max. and Min. Sinusoidal Rates of Operation (incl. permitted 'pretravel' and 'overtravel', for all models):—**FASTEST**: 1 full cycle of total-drive-plus-total-retraction in 0·1 Sec. (100mS.),=all drive in 0·05 Sec.,=10 cycles of movement per Sec. **SLOWEST**: 1 full cycle in 4·0 Secs.=total drive in 2 Secs.,=½ c/S.

MINIATURE MICRO-SENSITIVE SWITCHES

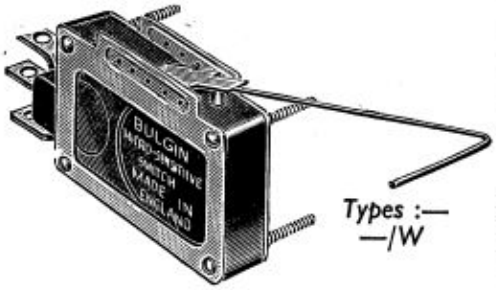
LEVER OPERATORS etc., FOR BULGIN MINIATURE ("M") MICRO-SWITCHES



Types :— —/L/R-G. to —/L/R-P



Types :— —/L



Types :— —/W

TO INCREASE the utility of the large range of "M" Micro-Switches on p. 89, we now offer six different Operator-Attachments. Each Operator is complete with a pair of side-brackets, and four 8-B.A. bolts and nuts, for the sandwiching assembly and fixing. Each operator-lever can be pivoted, in its brackets, in up to 5 different ways; over 750 possible combinations! Side-brackets of brass, barrelled-nickel-plated; Operators-levers, are nickel-silver-blades. Rollers, wire-extensions, are as tabled. Patents Pending.

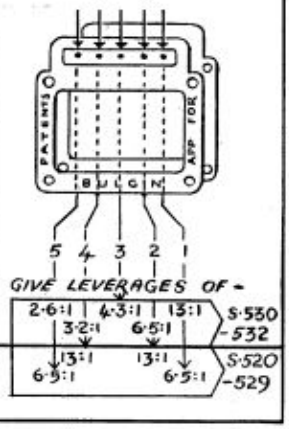
Add suffix to **List No.** of Switch	Description—in every case, 4 bolts and nuts, and pair of brackets (M.8058 × 2) accompany
—/W	Operator-leaf (short) with stainless steel **Wire** extension, M/SA/2004
—/L	Operator-leaf-**Blade**, M.8057, Nickel-silver
—L/R-G	Operator-leaf fitted with "u"-bracket, and **Graphitic Roller,** M/SA/2021
—/L/R-B	Operator-leaf fitted with "u"-bracket, and **D.N.P. Brass Roller,** M/SA/2021/1
—L/R-SS	Operator-leaf fitted with "u"-bracket, and **Stainless Steel Roller,** M/SA/2021/2
—L/R-P	Operator-leaf fitted with "u"-bracket, and **Tufnol Type Roller,** M/SA/2021/3

The operators, freely pivoted, add no forces to the switches, except their own weight. Leverages of from 2½ : 1 to 13 : 1 are given—see diagram, right.

Operation-*pressures* are *divided*, and operation-*distances* are *multiplied*, by the leverage obtained.

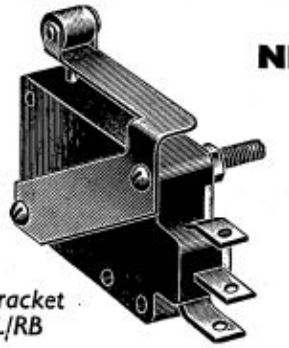
Plus pair of Mounting Brackets M.8058

Complete with 4 × 8 B.A. ½" R.H. bolts and nuts. These alternative pivot positions



Add suffix to List No. of Switches	TO OBTAIN EXTERNAL OPERATOR
Stainless Steel Wire —/W	
Nickel-silver blade —/L	
—/L/R.G.* —/L/R.B.* —/L/R.SS* —/L/R.P.*	

*Having **G**RAPHITE, NICKEL-PLATED **B**RASS, **S**TAINLESS-**S**TEEL, & TUFNOL (PLASTIC), ROLLERS, respectively. **Note**: Operators may also be reversed to project towards terminal tags.



Bracket SL/RB

NEW ONE-PIECE SIDE-BRACKET AND LEVER

THIS New one-piece phosphor-bronze bracket, with the free running stainless-steel roller giving positive pressure on the actuating button, is shown here fitted to the S.530–S.532 type Micro-Switch for which it is designed. Speedily fixed by two 8 B.A. nuts and bolts. Order by adding **"SL/RB"** to List No. of 'M' Micro-switch selected from those on p. 89, types S.530 or S.532 only.

MINIATURE OPEN BLADE MICRO-SWITCHES 91

GANGABLE LILLIPUT-SIZE OPEN-BLADE MICRO-SWITCHES

THESE amazing sub-miniature or Lilliput open Micro-sensitive switches fill a variety of uses. Extremely small—enclosing dims. $\frac{13}{64}$" long × $\frac{19}{32}$" high × $\frac{1}{4}$" thick—they can be incorporated into all kinds of equipment and appliances for all manner of electric switchings. Made as a universal S.P. unit, they can switch ON-OFF, OFF-ON, or CHANGE-OVER. High-quality thermo-setting bakelite insulation. The moving blades are of heat-treated *Be.-Cu.*, fitted with heavy, pure-silver rivet-contact; the fixed contacts, of *Cu.*, have heavy inlaid-Silver contact faces. Integral soldering tag extensions are provided, finished clean, ready for soldering, not plated. They are not tinned, to avoid possible Tin-deterioration at very low temperatures. Operations of the Switch should be by *insulated* push—or cam-means, near the end of its long arm. For long-life usage, adhere to operating-data given.

These switches may be ganged-grouped. Fixing:—2 × 8 B.A. clearance holes at $\frac{3}{8}$" crs.

List Nos. S.690, 691

(Approx. full size)

List No. S.695

(Nearly full size)

GANGABLE MEDIUM-SIZE OPEN-BLADE MICROSWITCHES

THESE new, larger, open Micro-sensitive Switches fill many applications. With enclosing dimensions of $1\frac{7}{16}$" × 1" = 36·5 × 25·4 mm., approx. × $\frac{5}{16}$" thick (= 8 mm.), fixing details as column 8 below, they will incorporate into all kinds of apparatus. Also made as universal S.P.C.O. units, they can be wired as normally-on, or normally-off, as well as for change-over. High quality phenolic (thermo-setting) insulation, *Be.Cu.* centre-blade, stainless-steel drive-blade, and pure-silver copper-carried fixed contacts. Integral solder-tag extensions. To be operated (Col. 7, below) by insulated drive means. Suitable, also, for gang-grouping.

ELECTRICAL DATA FOR S.690, S691, S.695 (Provisional)

D.C. Ratings			50~ Ratings			Max. Wkg. P.D. across contacts	Max. Test V., dry or recovered	Max. frequency or speed of operation, at the rate of:
V.	**S.690, S.691:** A.*	**A.695:** A*	V.	**S690, S.691:** A.*	**S.695:** A*			
12	3	3	12	3	6	250	1 KV.	10 total operations per Sec. or 1 total op. in 0·1 Sec.
50	1	1	50	2	5			
110	0·25	0·5	110	1·5	4			
250	0·1	0·3	250	1·0	3			

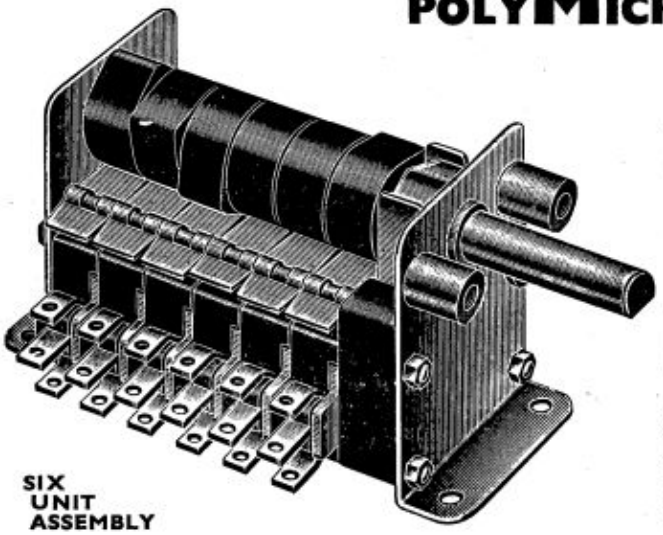
* *Peak*, if the circuit has any peak-currents which exceed mean-current.

MECHANICAL DATA (Provisional)

List No.	1 Nominal Contact Gap	2 Pre-travel allowable to user for longest life	3 Differential	4 Max. Over-travel, for longest life	5 Drive Force	6 Release Force or holding force	7 Point of Drive, dim. from line of fixing crs.	8 Fixing crs.
S.690	0·0125" (0·32 mm.)	0·015" (0·4 mm.)	0·018" to 0·031" 0·5 (0·8 mm.)	0·015" (0·4 mm.)	⩾ 10 ozs. (284 gms.)	2 ozs. (56·8 rms.)	$\frac{19}{32}$" (15·1 mm.)	–2×8 B.A. clear (= 0·090"⌀) @ $\frac{3}{8}$" crs. (9·5 mm.)
S.691	Do.	Do.	Do.	Do.	⩾ 5 ozs. (142 gms.)	1·5 ozs. 42·5 gms.	Do.	Do.
S.695	0·020" (0·5 mm.)	0·030" (0·75 mm.)	0·025" to 0·040" (say, 1 mm.)	0·025" (0·63 mm.)	⩾ 12, ⩽ 6, oz. 170-340 gm.	Approx. 1/5 of drive	$\frac{3}{4}$" (19 mm.)	24×B.A. clear @ $\frac{11}{16}$" crs. (17·5 mm.)

Notes to Columns:—(1) Manufacturing variances cover 0·010"—0·020", approx. Top-limit-gap switches have higher *differential* figs. (2) Relaxed, the pre-travel is much greater. For long operating life, User should limit the pre-travel (=Movement before switch clicks over, upon driving) to figure given; i.e., should not allow the drive-area, upon return action, to relax more than gives 0·015" pre-travel on re-drive. (3) The backwards movement necessary to restore to relaxed switching after drive-switching takes place. (4) If over-travel (= any continued driving movement after switches takes place) is allowed to be 0·031" (*absolute max.*), total operating life approx. halves. (5) Allow ozs. figure given in tables above, although some switches may seem to operate at less. (6) After switch has operated, the drive force (then, holding 'force') needed lessens. (If the drive-force is springy—e.g., a bimetal-strip—it may then stress into the over-travel zone. (7) The drive should usually be *insulated*, of course. The figure ($\frac{19}{32}$") may be reduced, but not less than $\frac{9}{32}$"; the forces then *increase*, and distances (at drive point) then decrease, in *ratio*.

POLYMICRO—NEW GANGED MAINS ROTARY MICRO-SWITCH



SIX UNIT ASSEMBLY

"POLYMICRO." This revolutionary new design in Micro-Switches incorporates the Bulgin S.P.C.O. Miniature "M" type Micro-Sensitive switches, ganged together in a highly-plated metal frame in any number, up to 12 units.

Operated by Polished Bakelite Cams threaded on to a hexagon shaft in any number of different positions at + 60°, up to six, and actuated either manually or automatically.

Each individual switch is basically S.P.C.O. for S.P.M.B. or S.P.B.M. and can be stacked to give many different switching arrangements. Dimension of 6-unit switch —$2\frac{51}{64}$" long × $1\frac{47}{64}$" high × $1\frac{3}{4}$" wide.

SIX UNIT ASSEMBLY

List No.	Description
S.670/6/*	6 Units, operated 1 per unit-movement of 60°, giving total and unstopped rotation
S.671/6/*	6 Units, operated 2 per unit-movement of 60°, 3 positions between stops
S.672/6/*	6 Units, arranged: 1st pos'n, 1 pole; 2nd pos'n, 2 more poles; 3rd pos'n, 3 more poles and STOP
S.673/6/*	6 Units, arranged as 2 × 3 pole, 2 positions between stops
S.674/6/*	6 Units, arranged as 1 pole + 5 poles; 2 positions between stops
S.675/6/*	6 Units, arranged as 1 pole + 4 poles + 1 pole; 3 positions between stops

Similar Assemblies, with up to six positions selected by control-shaft, are also made up as required. Any "POLYMICRO" Gang can have index-positioning omitted if wanted, and can also be made 'without stops' for continuous rotation. (Then, cams must be positioned for 6 switches per rotation, or lesser-no. of switchings 'staggered' or duplicated).

TWELVE UNIT ASSEMBLY

List No.	Description
S.670/12/*	12 units operated 2 per unit movement of 60° giving total and unstopped rotation
S.671/12/*	12 units operated 4 per unit movement of 60° 3 positions between stops
S.672/12/*	12 units arranged 1st. position=2 pole, 2nd position=4 pole, 3rd position= 6 pole, and stop
S.673/12/*	12 units arranged as 2 × 6 pole, 2 positions between stops
S.674/12/*	12 units arranged as 2 poles + 10 pole, 2 positions between stops
S.675/12/*	12 units arranged as 2 poles + 8 pole + 2 poles, 3 positions between stops

** User should cite desired List No. of Switch to be used throughout the group, from p. 89, according to Elec.-data desired.*

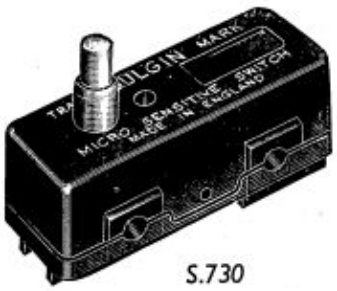
ELECTRICAL DATA

User should select suitable switch(es) Unit(s) from those on p. 89, and cite when citing above List No.(s) of types of Gang assembly.

THESE new special Micro Sensitive Bulgin rolling-spring switches will meet many special needs, and are available by arrangement. They all have the characteristic, particular to our Micro-Sensitive Switches, of biased or non-locking (except List No. S.705, toggle-action type) action, and very long operating and contact life, at rating. Many users achieve ½-, ¾- or even 1-million operations. Other special types are being evolved, for new needs and uses. The models shown below include: One-hole-fixing toggle-action; roller-headed plunger action without over-travel; over-travel type slender plunger; face mounting model—often used for window and door alarm circuits, etc.; manual-press or bell-push type; and new dual-gang. All are S.P.C.-O, with 250 V. max., 5 A. Max. (A.C.) contacts-rating, and may be proof-stressed at 2 kv., contacts to external metal parts, and worked at 500 V. P.D. thereat. All side-fixing holes shown are 4 B.A.-clear ($\frac{1}{32}$"∅) at 1" nom. crs.

S.705

S.715



S.730

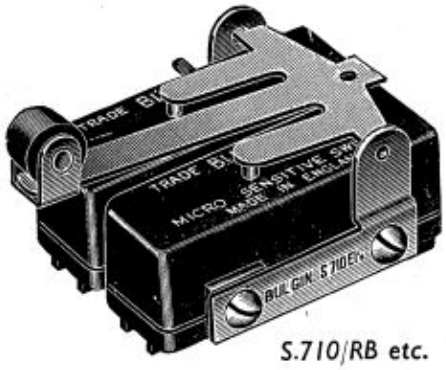
List No. S.705. One-hole fixing, toggle action, for $\frac{13}{64}$" diameter panel hole, max. panel-thickness of $\frac{7}{16}$" (·437) (always retain hex.-nut (*shown*) behind panel). Strong snap action with spring behind dolly, and standard Micro-Sensitive Rolling-Spring action. This is the only model on this page in which the action (and contacting) does not "return", automatically.

List No. S.715. The depressional plunger has inset roller for best non-weaving co-operation with sliding or rotant surfaces, max. depressability = $\frac{1}{32}$". Avoid over-travel; operation is averagely effected within 75% of depress figure given Operating force to be provided as 1 lb. min.

List No. S.730. The slender piston plunger operates the switch after ·017" average movement; the user may then have up to $\frac{1}{16}$" over-travel. Operation is best done by axial moving, rather than sliding or rotant surfaces.

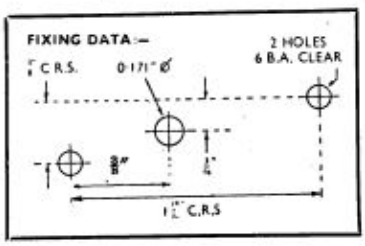
S.725

S.720



S.710/RB etc.

List No. S.725. Face mounting, fix by: 2 × 6 B.A. screws (*not provided unless requested*) to enter by ⊀ 0·1". Operating button is ·156" diameter—allow ·171" diameter hole through fixing surface. Button projects ¼", average pre-travel ·017", average over-travel ·009".



List No. 720. One-hole fixing, to $\frac{13}{64}$" diameter hole in panels up to "$\frac{7}{16}$ thick—it is essential to retain hex. nut (*shown*) behind panel. Fitted with large red-erinoid press button top, for manual operation. Depressional distance = $\frac{1}{16}$" total, max. depress.-force ⊁ 2 lb.

We invite enquiries for special micro-sensitive switches required in quantities.

List No. S.710/RB, etc. A useful 2-gang or double pole structure but not intended for simultaneous-poles operation. Useful for double-circuit or successional switching. (*User can adjust blades angles.*)

List No.	Description
S.710L/*	Leaf-drive, *without Roller*
S.710RB/*	Leaf drive with Roller: Brass, N.P.
S.710RG/*	Leaf drive with Roller: Graphite-compound
S.710RP/*	Leaf drive with Roller: Tufnol-type
S.710RSS/*	Leaf drive with Roller: Stainless-steel

**Add* List No. (from range "S.500"—"S.505") of BULGIN Micro-Switch required—duplicates must be used.

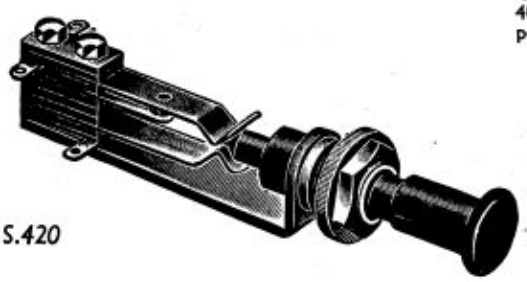
"PRESS-KEY" SWITCHES

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

(WITH BIASED ACTION)

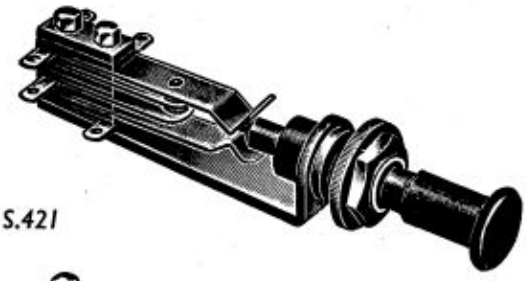
BIASED PUSH-SWITCHES OR "-KEYS"

AN outstanding range of switches, spring-loaded-outwards for push (biased) action, with contact combinations covering 1- and 2-pole circuiting, on-off and change-over. Occupying minimum panel space (approx. $\frac{5}{16}$" × $\frac{3}{4}$") and of only $2\frac{1}{8}$" approx. depth, and fitted $\frac{3}{8}$"Ø 26 t.p.i. fixing bush (not live to any pole) for panels of 22 S.W.G.–$\frac{1}{4}$" thickness. With switching-leaves of hard rolled 'nickel-silver,' and *Ag.*-alloy contacts, and *Ag.*-plated solder-tags. Rust-proofed steel frames. Approx. $\frac{1}{16}$" movement of action. Suitable for circuits of 0·01–250 V. 5–0·2 A. max. respectively (50 ~ A.C. ratings). Cover a wide diversity of uses, and fill a long-felt need. I.R. ≮ 40MΩ @ 500 V. peak (= max. test V.). Knobs normally black, polished moulded thermo-setting plastic material.



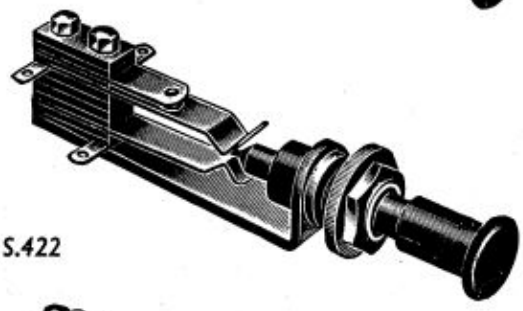
S.420

List No. with PRESS action (spring return)	Ideogram	Contacting
S.420		S.P. Make-break (push to break)



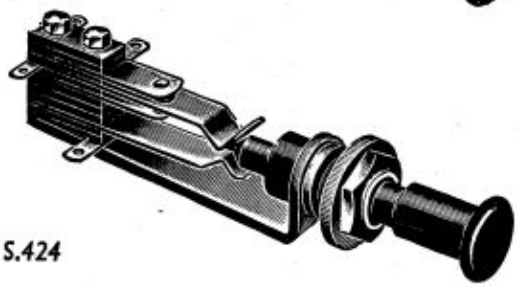
S.421

List No. with PRESS action (spring return)	Ideogram	Contacting
S.421		D.P. Make-break (push to break)



S.422

List No. with PRESS action (spring return)	Ideogram	Contacting
S.422		S.P. Break-make (push to make)



S.424

List No. with PRESS action (spring return)	Ideogram	Contacting
S.424		S.P.C.O.

* Not illustrated; similar.

List No. with PRESS action (spring return)	Ideogram	Contacting
***S.423**		D.P. Break-make (push to make)
***S.425**		D.P.C.O.

Alternative front-nuts (normally chrome-plated, other finishes to quantity-order). Part Nos., *left* to *right*, 1145, 524, 6629. Unless otherwise requested, 1145 is supplied.

Moulded front-bushing-'nut,' normally black. Fixing hole Ø becomes $\frac{1}{4}$". Switches then work ≯ 500 V. ~ to E. Part No. 6247.

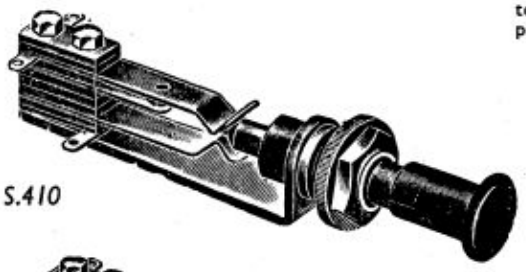
Insulating washers, Part Nos. 1557, 1058, respectively. 1557 normally supplied. 1058 completes bushing with moulded front-'nut' shown *left*.

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

(WITH PUSH-PULL ACTION)

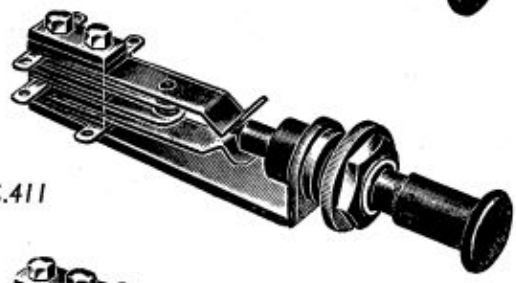
PUSH-PULL SWITCHES OR "-KEYS"

AN outstanding range of switches with direct push-pull action, with contact combinations covering 1- and 2-pole circuiting, on-off and change-over. Occupying minimum panel space (approx. $\frac{3}{16}$" × $\frac{3}{4}$") and of only $2\frac{3}{8}$" approx. depth, and fitted $\frac{3}{8}$"Ø 26 t.p.i. fixing bush (not live to any pole) for panels of 22 S.W.G.–$\frac{1}{4}$" thickness. With switching-leaves of hard rolled 'nickel-silver,' and SILVER-alloy contacts, and SILVER-plated solder-tags. Rust-proofed steel frames. Approx. $\frac{1}{8}\frac{1}{4}$" movement of action. Suitable for circuits of 0·01–250 V. 5–0·2 A. max. respectively (50 ~ A.C. ratings). Cover a wide diversity of uses, and fill a long-felt need. I.R. ≮ 40MΩ @ 500 V. peak (= max. test V.). Knobs normally black, polished moulded thermo-setting plastic material.



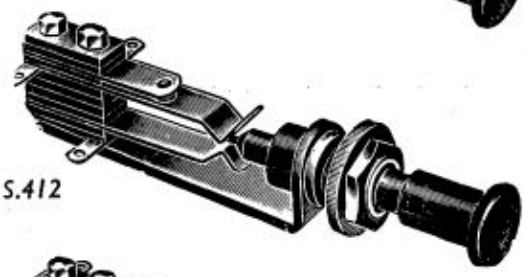
S.410

List No. with PUSH-PULL action	Ideogram	Contacting
S.410		S.P. Make-break (push to break)



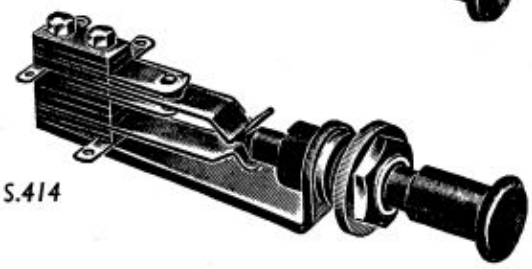
S.411

List No. with PUSH-PULL action	Ideogram	Contacting
S.411		D.P. Make-break (push to break)



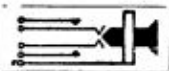
S.412

List No. with PUSH-PULL action	Ideogram	Contacting
S.412		S.P. Break-make (push to make)



S.414

List No. with PUSH-PULL action	Ideogram	Contacting
S.414		S.P.C.O.

List No. with PUSH-PULL action	Ideogram	Contacting
*S.413		D.P. Break-make (push to make)
*S.415		D.P.C.O.

* Not illustrated; similar.

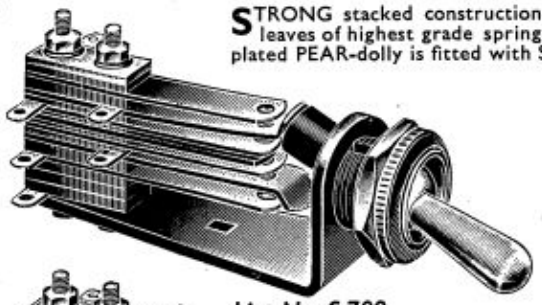
Alternative front-nuts (normally chrome-plated, other finishes to quantity-order). Part Nos., *left* to *right*, 1145, 524, 6629. Unless otherwise requested, 1145 is supplied.

Moulded front-bushing-'nut', normally black. Fixing hole Ø becomes $\frac{1}{2}$". Switches then work ≯ 500 V. ~ to E. Part No. 6247.

Insulating washers, Part Nos. 1557, 1058, respectively, 1557 normally supplied. 1058 completes bushing with moulded front-'nut' shown *left*.

SWITCHES, JACK-STACKED TYPE

PANEL-MOUNTING 3-POSITION SWITCHES



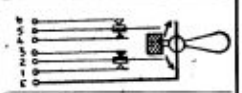
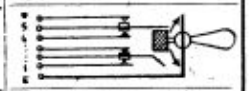
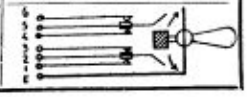
List No. S.700

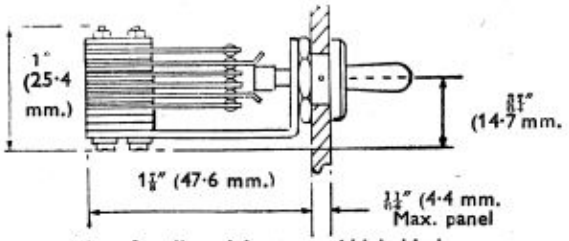
List No. S.701

List No. S.702

STRONG stacked construction on a rust-proofed steel frame with contacting and switching leaves of highest grade spring-nickel silver with pure silver contact points. The nickel-plated PEAR-dolly is fitted with S.R.B.F. insulated rear; the action operates firmly to the switching leaves in either of the 'On' positions. Fixing:—Provide $\frac{13}{32}$" ∅ clearing hole with $\frac{1}{4}$" key for panels up to $\frac{11}{64}$". The first model has double locking action. Two similar but biased (= 'non-locking') models are also available, as shown in tables. Contacting:—1 pole C.—O., + 2nd Pole, C.—O. (3 positions), for all three types—see ideograms.

Working Rating: 0·01—250 V., 50 ~, 5—0·2 A., 50 W. max. load. *PEAK* Test V., 500 max., dry or recovered.

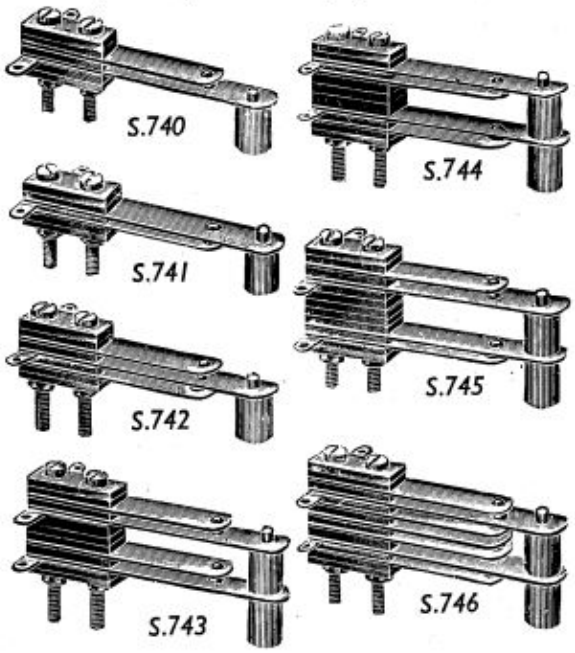
List No.	Description (each 'side' is separate 'S.P.C.O.')	Ideogram
S.700	Non-biased model. Locks in both side positions with normal position in centre	
S.701	One side biased to off, second side locking. Centre normal	
S.702	Both sides biased (non-locking action) centre = normal position	



Dims. for all models; max. *width* behind panel = $\frac{5}{8}$" (15·9 mm.)

SKELETON SWITCHES FOR IN-BUILDING

A NEW RANGE of leaf switches with stacked S.R.B.P. insulation and blades of highest-grade spring nickel-silver, fitted with pure-silver contacts, silver-plated solder-tags, and S.R.B.F. 'buttons' for push operation. Average push distance, $\frac{3}{32}$" = 4·6 mm. Max. permitted travel (to avoid over-set), $\frac{1}{8}$" = 6·4 mm. These switches find uses in all classes of apparatus, and are easily accomodated, fixed, and employed. They may be used at prospective V.: 0·01–250, 50 ~, 5–0·2 A. (50 W. max. load, and take *peak* test V. 500, dry or recovered. Average push-force, 2 ± 1 oz. *per pole*.

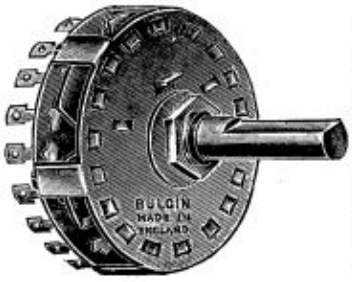


List No.	No. of Poles	Contacting	Max. O.A Height at Fixing
S.740	1	Normally open, push to make	½" (12·8mm.)
S.741	1	Normally closed, push to break	$\frac{9}{16}$" (14·5mm.)
S.742	1	Change-over (break before make)	$\frac{9}{16}$" (14·5mm.)
S.743	2	*Both* poles normally open, push to make	$\frac{13}{16}$" (21mm.)
S.744	2	*Both* poles normally closed, push to break	$\frac{13}{16}$" (21mm.)
S.745	2	*One* pole (nearest fixing) normally closed, push to break; *Second* pole, normally open, pushing closes	$\frac{7}{8}$" (22·5mm.)
S.746	2	*Both* poles change-over (break before make), simultaneity not guaranteed	$\frac{7}{8}$" (22·5 mm.)

Fixing:—8 B.A. Stems extend for ¼" (6·4 mm.) and are provided each with one nut, $\frac{9}{32}$" (7·1 mm.) centres. Fixing-surface area occupied 1⅜" × ⅝" (44·5 mm. × 15·9 mm.) (including solder-tags)

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

SMALL ROTARY SNAP-ACTION SELECTOR SWITCHES



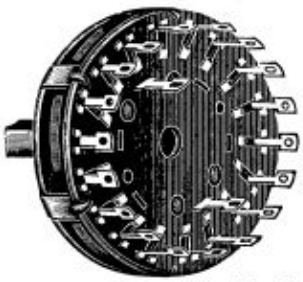
Front view of all models.

List Nos. S.205–8, 249, 435–8

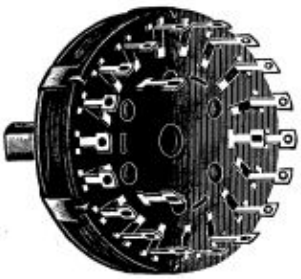
MEASURING only 1¾" ∅ with rear-projection of ¾", these efficient rotary selector switches find many uses. They have all contacts ' dead ' from frame or fixing, and may be used in positions giving ⩾ 500 V. to E. Tested for dry insul. res. of ⩽ 40M Ω at 500 V. =, proof-tested @ 1 KV. ~ (max.). Clean make-before-break or break-before-make action : soldering tags integral with contacts : low-contact resistance assured by heavy SILVER-plating. For loads of 10 W. peak max., subject to maxima of 250 V. (across opened contacts and between poles) and 1 A. min. V., 0·1. Contact res. ⩾ 0·005 Ω at 2 A. at 2 V. With 26 t.p.i. ⅜"∅ fixing bush, for panels, ⩾ 1/32" thick. Panel hole 13/64"∅ required for locating ' key ' lug, at ⅜" crs. from shaft. Standard ¼"∅ (0·247"–0·249" actual) shaft with ' flat ' ; 1⅛" projection. Frame and shaft finished rust-resisting.

Specially suitable for meter-switching, tone-control, wave-change, etc., etc. Not ' gangable,' but complete and self-contained. Increment of movement, 20°. Contacts may be arranged in parallel (in S.206–7–8, 435–6) to increase current rating, with voltage-figures remaining unaffected.

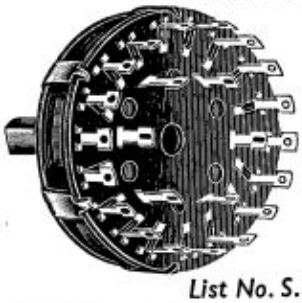
Further movement-restriction on any model—e.g., S.206 as 2-pole 8-way—may be had by panel stops against a lever-type knob—for all knobs, see pp. 18–26.



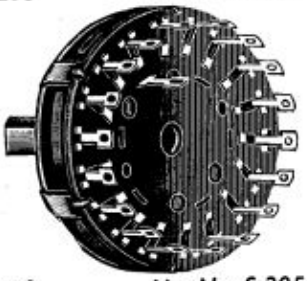
List No. S.206



List No. S.207



List No. S.208



List No. S.205

List Nos. of MODELS		No. of Poles	No. of Ways	Total angle of Movt.
Make Before Break	Break Before Make			
S.206	S.436	2	9	160°
S.207	S.437	3	6	100°
S.208	S.438	6	3	40°
S.205	S.435	1	18	360° (no stops)
S.249	—	1	9	80° *

Rear view of each tabulated model

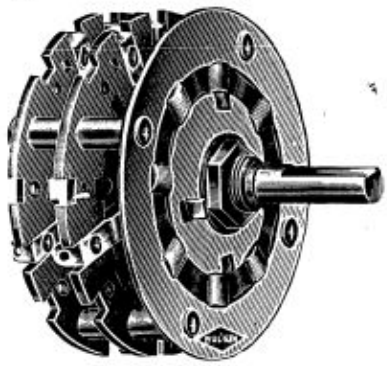
* Special Additive Grouping Switch.

LARGE ROTARY SNAP ACTION SWITCHES

A SIMILAR but larger *heavy duty* switch, which will handle (*per pole*) 2A. peak at 250 V. 50 ~ and which takes 2 KV. 50 c/s proof-test, measuring 2¼"∅ × 1 7/32", plus 13/16" shaft extension, 2-pole, 5-position (with contacting: make-before-break, break-before-make), suitable for variable speed control, etc. Made with Cadmium-plated steel frame, and standard ¼"∅ (0·247"–0·249") shaft with ' flat.' Heavily SILVER-plated contacts are carried upon highest grade bakelite-board (S.R.B.P., Grade II) with integral solder tags for ease of soldering. The rotating contacts are fully floating and self-aligning, and the action is fully ' snap ' and positive.

Special models, to agreed special orders, can be made in 1-, 2-, or 3-pole, up to 8-way, and with MAKE-*before*-BREAK (wide-blade rotors) or BREAK-*before*-MAKE (narrow-blade rotors) at any or all poles.

Suitable for a wide variety of uses on 1-ph. A.C. circuits; variable speed-control, multi-heat, etc., etc. (**D.C. rating,** approx. 0·3 A. max. (peak) at 200–250 V. or 2 A., 50 V., or 6 A., 6 V.).

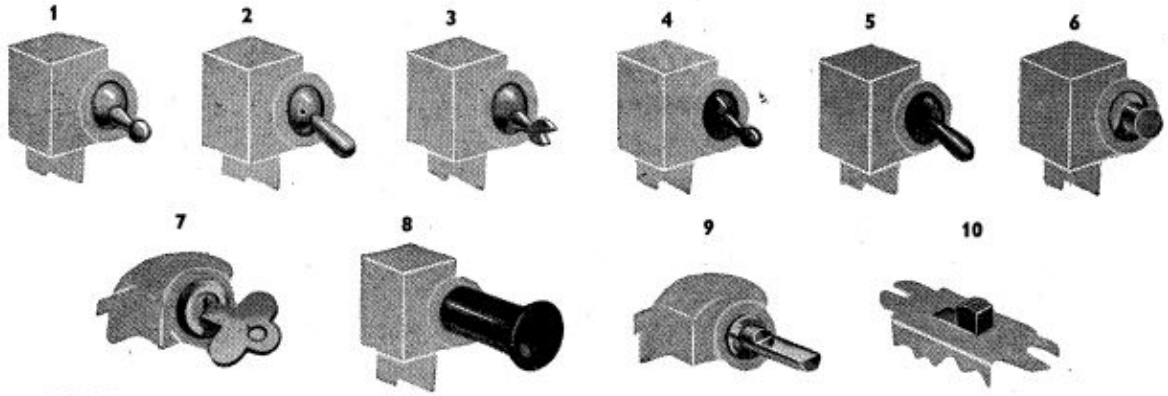


List Nos. of MODELS		No. of Poles	No. of Ways	Total angle of Movt.	Notes
Make Before Break	Break Before Make				
S.430 *One pole with each type of contacting*		2 1+1	5	180°	45° Increment. One pole each M.-before-B., B.-before-M. Suitable for vari.-speed control, etc.
S.430 /M	S.430 /B	2	5	180°	Similar to S.430, but with both poles alike *as to* M.-b.-B. or B.-b.-M.
S.461	S.460	1	5	180°	Similar switches to List No. S.430, but single-pole

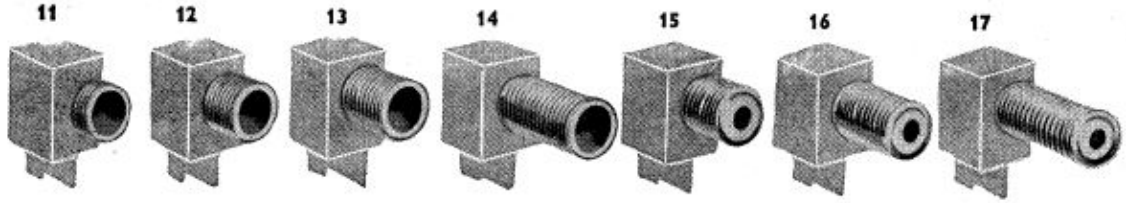
A wide range of Knobs and dials for these switches is shown on pp. 18–26.

INTRODUCTION TO BULGIN MINIATURE SWITCHES

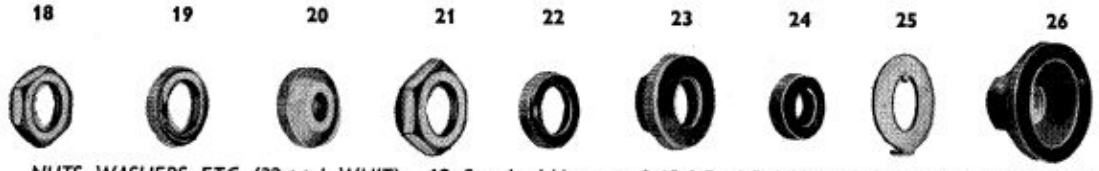
BULGIN MINIATURE TOGGLE SWITCHES, with Laminated Insulation of highest grade Bakelite Sheet, and steel-clad, for highest electrical performance, with ruggedness and shock-resisting characteristics, and fully snap Q.M.B.-Action for 25,000 ops. type-test-life, have a variety of alternative characteristics :—



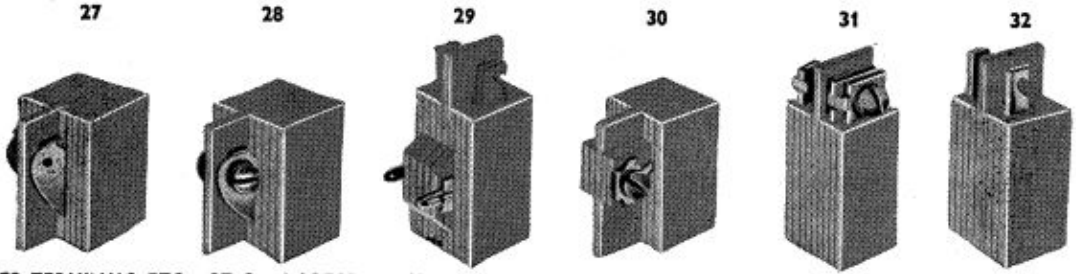
OPERATION.—**1.** *Normal Ball-dolly* (**List No. as printed**). **2.** *Pear-dolly* (**List No.** xxx/**PD**). **3.** *Forked-dolly (mechanical operation)* (**List No.** xxx/**SD**). **4.** *Insulated Ball-dolly* (**List No.** xxx/**INS.**). **5.** *Insulated Pear-dolly* (**List No.** xxx/**PD**/**INS.**). **6.** *Push-button* (**Separate List Nos.**). **7.** *Key (removable)-operated* (**Separate List Nos.**). **8.** *Push-pull ; Moulded Knob provided* (**Separate List Nos.**). **9.** *Semi-rotary ;* $\frac{1}{4}$*"Ø, for Knobs to choice.* (**Separate List Nos.**). **10.** *Slide-operational* (**Separate List Nos.**).



BUSHES (32 *t.p.i. WHIT.*).—**11.** *Short-bush, for* 18 *S.W.G. panels.* **12.** *Standard-bush, for* $\frac{1}{16}$*" panels.* **13.** *Long-bush, for* $\frac{3}{16}$*" panels.* **14.** *Extra-long bush, for* $\frac{5}{16}$*" panels.* **15.** *Standard Bush, Rotary Switches* ($\frac{7}{16}$*" panels).* **16.** *Special Bush* ($\frac{1}{4}$*" panels) Long-E-path types.* **17.** *Long Bush, Rotary Switches.*



NUTS, WASHERS, ETC. (32 *t.p.i. WHIT*).—**18.** *Standard Hex.-nut, 0·6" A.F.,* $\frac{3}{32}$*" thick.** **19.** *Standard Ring-nut,* $\frac{1}{32}$*" thick.†* **20.** *Front-nut for Key Switches.††* **21.** *Adaptor Nut (for 0·6"Ø Panel Hole).* **22.** *Moulded front-nut with brass-insert (NOT Panel Bushing).* **23.** *Moulded front-nut (Panel Bushing).* **24.** *Small-Ø Moulded front-nut (NOT Panel-Bushing).* **25.** *Lock-to-Panel washer (anti-rotational).* **26.** *Moulded front-cup nut.* (Also see pages 119, 127).



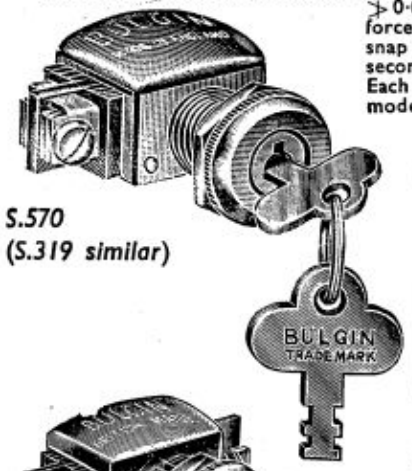
TAGS, TERMINALS, ETC.—**27.** *Special REAR-tags (for S.P. switches, ON-OFF, only) (to quantity orders).* **28.** *Special REAR-terminals (for S.P. switches, ON-OFF only) (to quantity orders).* **29.** *Standard REAR-tags (D.P. Switches).* **30.** *Standard REAR-terminals* where listed. **31.** *Standard END-terminals, easy wire-capturing.* **32.** *Standard END-tags, easy soldering.*

* Rear-of-panel on manual-dolly switches ; also front-of-panel for rotary-switches and slotted-dolly switches. †Front-of-panel with manual-dolly switches. †† Suppliable on other switches, by request.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(KEY-OPERATED ROTARY SNAP-SWITCHES)

AUGMENTED by the inclusion of further types this well-known range of key-operated roller-contact switches now covers a whole variety of contact combinations. Insulation is of highest grade bakelite-type synthetic resin bonded paper-board, and all metal parts are highly plated. Contacting members are silver-plated and integral soldering tags are provided. Working voltages, 6–250 A.C. or D.C. : max. test voltage 1000 *peak* : insul. res., $>$ 40MΩ : contact res., $>$ 0·01 Ω (10mΩ) at 6 V. and 2 × rated amps. Angle of operation, 60° ± 10°. Reverse force against internal stops, $>$ 7 lb.-in. for all key-switches. Clean make-and-break snap action. Fixing by $\frac{1}{8}$"Ø hole, preferably with re-entrant ' key ' $\frac{3}{16}$" × $\frac{1}{8}$". A second nut is provided and should be retained behind panel ; thread, 32 t.p.i. Whit. Each complete with *one* key. All S.P. models are also available with terminals, see typical model illustrated.

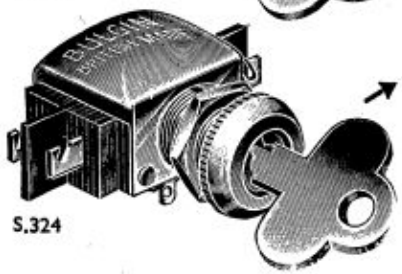


S.570
(S.319 similar)

S.320

S.321

S.322



S.324

KEY REMOVABLE AT 'OFF' or 'anti-clock' position		KEY REMOVABLE AT 'ON' or 'clock' position		KEY REMOVABLE IN BOTH POSITIONS		General Data ; Peak Amps. are at 250 V. ~ ; may be doubled at 6–12 V. ≅			
List No. (terminals)	List No. (solder-tags)	List No. (terminals)	List No. (solder-tags)	List No. (terminals)	List No. (solder-tags)	IDEO-GRAM	Poles	Switching	Peak Amps.
S.570	**S.319**	**S.570 /R**	**S.319 /R**	**S.570 /D**	**S.319 /D**		1	M-B*	3
S.571	**S.320**	—	—	**S.571 /D**	**S.320 /D**		1	C-O or 2-way†	2
—	**S.321**	—	**S.321 /R**	—	**S.321 /D**		2	M-B*	1
—	**S.322**	—	—	—	**S.322 /D**		1	4-pt. M-B‡	1
—	**S.324**	—	—	—	**S.324 /D**		2	C-O	1

KEY REMOVABLE AT 'ON' or 'anti-clock' position		—		KEY REMOVABLE IN BOTH POSITIONS		General Data ; Peak Amps. are at 250 V. ~ ; may be doubled at 6–12 V. ≅			
S.574	**S.449**	—	—	**S.574 /D**	**S.449 /D**	 §	1	B-M†	3

* Turn clockwise for ' Make ' (= ' ON '). † For C-O, join one tag at each end as ' centre-point ' ; or, 'alternative-circuit.' ‡ 4 points all ' open ' at ' break,' but all joined to ' make ' upon clockwise operation. § Turn clockwise for ' Break ' (= ' OFF ') and counter-clockwise for ' Make ' (= ' ON ') ; all positions are reversed with the models in this line of table.

Use : Direct fixing to panels up to $\frac{1}{8}$" thick. See p. 127 for fitting means for thicker panels.

Spare key, for all models, **S.355.**

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(SEMI-ROTARY SNAP-SWITCHES)

SEMI-ROTARY Q.M.B. SNAP-SWITCHES

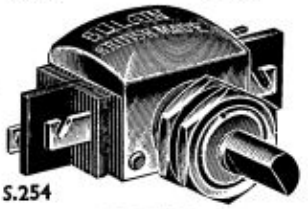
AUGMENTED by the inclusion of further types this well-known range of semi-rotary roller-contact switches now covers a whole variety of contact combinations. Insulation is of highest grade bakelite-type synthetic resin bonded paper-board, and all metal parts are highly plated. Contacting members are silver-plated and integral soldering tags are provided. Working voltages, 6–250 A.C. or D.C. : max. test voltage 1,000 *peak* : insul. res., $\lessdot$ 40M Ω : contact res., $\gtrdot$ 0·01 Ω (10M Ω) at 6 V. and 2 × rated amps. Angle of operation, 60° ± 10°. Reverse force against internal stops, $\gtrdot$ 10 lb.-in. Clean make-and-break snap action. Fixing by $\frac{1}{12}$"Ø hole, preferably with re-entrant ' key ' $\frac{1}{12}$" × $\frac{1}{32}$" for panels up to $\frac{1}{4}$" thick. A second nut is provided and should be retained behind panel ; thread, 32 t.p.i. Whit. Shafts on semi-rotary types project $\frac{1}{2}$" from front of bush, and are $\frac{1}{4}$"Ø (0.247"–0.249" actual) and take standard knobs (for details, see pages 18–26). Shaft is ' flatted.' Whilst solder-tag models are popular, all S.P. switches can also be supplied with terminals, as tabled : S.565 is illustrated, as also is K.107 knob, page 18.

List No. S.565 showing K.107 knob (see p. 18) added

List No. (Terminals)	List No. (Solder-tags)	IDEO-GRAMS	No. of Poles	Switching	Peak† Amps
S.565	S.253		1	M.-B.*	3
Notes on Use, etc.	For all S.P. on-off uses ; for panels $\frac{1}{4}$" *max.* Turns clockwise for ' on.' General-purpose type.				

S.253

List No. (Terminals)	List No. (Solder-tags)	IDEO-GRAMS	No. of Poles	Switching	Peak† Amps
S.566	S.254		1	C.-O.	2
Notes on Use, etc.	For all S.P. change-over or alternative-circuit uses ; for panels $\frac{1}{4}$" *max.* Turning the shaft clockwise connects the *l.h.* tags/terminals.				

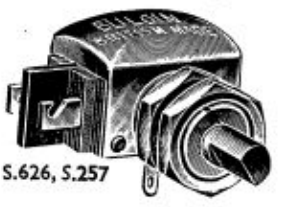


S.254

List No. (Terminals)	List No. (Solder-tags)	IDEO-GRAMS	No. of Poles	Switching	Peak† Amps
—	S.255		1	4-point M.-B.*	1
Notes on Use, etc.	For S.P. on-off where two or three ' loads ' or circuits are to be joined to supply for ' on,' yet are all isolated from each other at ' off.'				

S.255

List No. (Terminals)	List No. (Solder-tags)	IDEO-GRAMS	No. of Poles	Switching	Peak† Amps
—	S.256		2	M.-B.*	1
Notes on Uses, etc.	For all D.P. on-off uses, general purpose for safety switching or for twin-supply control.				



S.626, S.257

List No. (Terminals)	List No. (Solder-tags)	IDEO-GRAMS	No. of Poles	Switching	Peak† Amps
—	S.257		2	C.-O.	1
Notes on Use, etc.	For all D.P. change-over uses, or where two circuits must each be controlled.				

P/No. 8780
(with switch & K.107, [p.18] knob.)

THE ILLUSTRATION, LEFT, SHOWS ESCUTCHEON P/No./8780— see page 127

*M.-B. (on-off) types turn clockwise for 'make'. Specially to order, models with reversed action can be made. Or S.566, S.254 can be used for reversed ON-OFF.

†At 250 V. ~; may be doubled at 6–12 V. ⎓.

Long-bush models, see page 101'

SEMI-ROTARY LONG-BUSH Q.M.B. SNAP-SWITCHES

AUGMENTED by the inclusion of LONG-BUSH types this well-known range of semi-rotary roller-contact switches now covers a whole variety of contact combinations. Insulation is of highest grade bakelite-type synthetic resin bonded paper-board, and all metal parts are highly plated. Contacting members are silver-plated and integral soldering tags are provided. Working voltages, 6–250 A.C. or D.C. : max. test voltage 750 *peak* : insul. res., $\lessdot$ 40M Ω : contact res. $\gtrdot$ 0·01 Ω (10 m Ω) at 6 V. and 2 × rated amps. Angle of operation, 60° ± 10°. Reverse force against internal stops, $\lessdot$ 10 lb.-in. Clean make-and-break snap action. Fixing up $\frac{15}{32}$″ ø hole, preferably with re-entrant ' key ' $\frac{1}{32}$″ × $\frac{1}{4}$″ for panels up to $\frac{1}{16}$″ thick. A second nut is provided and should be retained behind panel ; thread, 32 t.p.i. Whit. Shafts on semi-rotary types project $\frac{1}{2}$″ from front of bush, and are $\frac{1}{4}$″ ø (0·247″–0·249″ actual) and take standard knobs (for details, see pages 18–26). Shaft is ' flatted.' All S.P. models can be supplied with terminals instead of solder-tags, as tables.

List No. S.128

List No. (With Solder-tags)	List No. (With Termi-nals)	IDEO-GRAM	No. of Poles	Switching	Peak† Amps.
S.128	**S.128 /termin'ls**		1	M.-B.*	3
Notes on Use, etc.	For all S.P. on-off uses ; for panels $\frac{29}{32}$″ *max.* Turn clockwise for ' on.' General-purpose type				

List No. S.129

List No. (With Solder-tags)	List No. (With (Termi-nals)	IDEO-GRAM	No. of Poles	Switching	Peak† Amps
S.129	**S.129 /termin'ls**		1	C.-O.	2
Notes on Use, etc.	For all S.P. change-over or alternative-circuit uses ; for panels $\frac{29}{32}$″ *max.* Turning the shaft clock-wise connects the *l.g.* tags/terminals				

List No. S.467

List No. (With Solder-tags)	IDEO-GRAM	No. of Poles	Switching	Peak† Amps
S.467		2	C.-O.	1
Notes on Use, etc.	For all D.P. change-over uses or where two circuits must each be controlled			

List No. S.466

S.465 and 466 have identical external appearance, illustration above.

Clockwise for *ON* or ' Make.' Reversed action (clockwise for ' break,' OFF) can be made to order in quantities, or S.129 can be used, wiring only one pair of tags.

List No. (With Solder-tags)	IDEO-GRAMS	No. of Poles	Switching	Peak† Amps
S.465		1	4-point M.B.*	1
Notes on Use, etc.	For S.P. on-off where two or three ' loads ' or circuits are to be joined to supply for ' on,' yet are all isolated from each other at ' off.'			
S.466		2	M.-B.*	1
Notes on Use, etc.	For all D.P. on-off uses, general purpose for safety switching or for twin-supply control.			

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

BIASED, SINGLE- AND DOUBLE-POLE

PRESS-ACTION BIASED SNAP-SWITCHES

List Nos. S.365, 366

THE roller-contact laminated switches, made with finest grade S.R.B.P. and normally nickel-plated metal parts and plungers have q.m.b. action, snap-contacting, and are rated for peak amps. as below tabled, at 6–250 V., 750 V. max. test (2 KV. if insulatedly-mounted), all figures at 50 ~. I.R. ⩽ 40M Ω at 500 V. ⎓, C.R. ⩾ 0·01 Ω (10 m Ω) at 2 × rated Amps. at 2 V. All contacts, tags, terminals, heavily *Ag.*-plated, for easy instant soldering. Fixing : $\frac{15}{32}$″ ∅ × up to $\frac{19}{64}$″ thickness. Thread 32 t.p.i. Whit-form. Escutcheons, Alternative-nuts, Bushings (for 2 KV. test), etc., see p. 123.

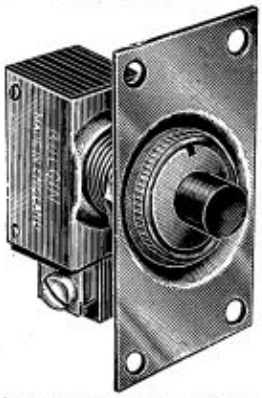
These switches are suitable for refrigerator lights, cupboard lights, ' mains-bell-pushes,' Refrigerator and cupboard fans, circulators, ventilators, refrigerator remote-signal -lights, etc. Plunger travel, approx. $\frac{1}{8}$″. Operating-force, approx. 8 lbs.

List Nos. S.358, 359

List No. with Terminals	List No. with Solder-tags	IDEO-GRAMS	Switching*	Peak† Amps.
S.358	**S.365**		S.P., OFF-ON (B.-M.) (Push for ' ON ')	3
Notes:—Refrigerators, cupboards, etc., where opening is to give ' OFF '				
S.359	**S.366**		S.P. ON-OFF (M.-B.) (Push for ' OFF ')	
Notes:—Refrigerators, cupboards, etc., where opening is to give ' ON '				

List No. S.357

List No. with Terminals	List No. with Solder-tags	IDEO-GRAM	Switching*	Peak† Amps.
S.371	**S.357**		S.P.C.-O. (Push for change-over or alternative-circuit)	2
Notes:—Refrigerators, cupboards, etc., where change-over switching is required				



List No. S.358 or S.359 with Part No. 6137 mounting escutcheon— *see page 127.*

List No. with Terminals	List No. with Solder-tags	IDEO-GRAMS	Switching*	Peak† Amps.
—	**S.417**		D.P. OFF-ON (M.-B.) (Push for ' ON ')	1
—	**S.418**		D.P. ON-OFF (B.-M.) (Push for ' OFF ')	1
—	**S.419**		D.P.C.-O. (Push for change-over)	1
Notes:—Refrigerators, cupboards, etc., but *double*-pole switching				

All BULGIN Toggle-action switches—ball-dolly, pear-dolly, push-button (as above), etc., are type tested to many operational cycles as a routine type test on all manufactured batches. Thus, according to type or model, a working life of 10,000–25,000 operations is assured under proper working conditions. Since, in many official tests, only 3,000 or 5,000 operations are called for, it is quite usually found that the life of BULGIN switches is what may be termed abnormally long.

* Relaxed or unstressed, or normal, is named first. † At 250 V.~. Peak = the highest current value within first 25 mS. of making or breaking the circuit. These peak-Amp figures may be doubled at 6–12 V. ⎓.

(FOR CUPBOARD-DOORS, REFRIGERATORS, etc.)

THERE is a very strong modern tendency to operate lights or other devices automatically, by the opening of a door or gate. Examples which will readily suggest themselves are Refrigerators, Cupboards, Cocktail-Cabinets, Airing-Cupboards, Pantries, etc.—all items where a door or lid is opened, and a light is needed for the duration of the opening. Throughout this catalogue, a wide range of switches will be found, which are adaptable to this purpose ; pp. 86–90, 94, 95, and 102, show some of these.

The special types on *this* page, however, are specially offered for this particular work. In both models, contact is broken *in* first 0·040″ (1 mm.) of movement. Remainder of movement is " follow-through " or over-travel.

SILENT ACTION PANEL-MOUNTING PRESS-SWITCH, SINGLE-POLE (ALL-MOULDED INSULATION, 1 KV. ~ TEST)

List Nos. S.618 and S.619

List No.	Connections	Drive	Contacting	Max. Current (peak) @ 6–12 V. ≅	100–250 V. ~	100–250 V. =
S.618 *was 'S.619 Terminals'*	4 B.A. Terminals	¾–1 lb. thru approx. ¼″	Press for OFF	2 A.	0·5 A.	0·1 A.
S.619	Solder-tags					

S.618 S.619	DIMENSIONS :—$\frac{15}{16}$″ (24 mm.) × $\frac{17}{32}$″ (13·5 mm.) panel area, × 1$\frac{3}{8}$″ (35 mm.) deep, max., behind panel. Panel-hole :—$\frac{15}{32}$″ (12 mm.) Ø in panels up to $\frac{11}{64}$″ (5 mm.) thick. *Black*-button.

Mounting accessories—escutcheons for thick panels or walls, or for conversion to 'surface-fixing,' will be found on p. 127

In some uses, an entirely surface-mounting switch, for surface-wiring, must be used. In such cases, the model shown below is of particular appeal, being easily wired and fixed, and requiring particularly low pressure or force to operate it, with the equal feature—where this is desirable—of entirely silent action.

SILENT-ACTION SURFACE-MOUNTING PRESS-SWITCH, SINGLE-POLE (ALL-MOULDED INSULATION, 1 KV. ~ TEST)

List No. S.621

List No.	Connections	Drive	Contacting	Max. Current (peak) @ 6–12 V. ≅	100–250 V. =	100–250 V ~
S.621	Internal terminals	26 ozs., thru approx. $\frac{11}{32}$″*	(S.P.) Press for OFF	2–1 A.	0·1 A.	0·5 A.
S.621	DIMENSIONS :—1″ (25·4 mm.) × 1$\frac{7}{16}$″ (34·9 mm.), × $\frac{7}{16}$″ (11·1 mm.) thick ; Plunger central ; projects $\frac{3}{8}$″ (8·7 mm.) at $\frac{3}{16}$″ (4·8 mm.) Ø. Fixing :—2 holes ·120″ (3 mm.) Ø at 1$\frac{1}{8}$″ (28 mm.) centres, for 6 B.A. or No. 4 wood screws.					

* Contact is BROKEN within first $\frac{1}{32}$″ of movement, which is $\frac{11}{32}$″ (8·7 mm.) total.

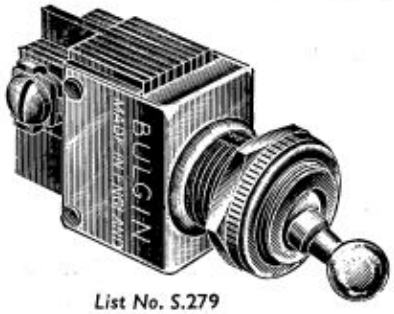
Normal Colour of all mouldings is BLACK ; Special colour-matches can only be executed to agreed quantity orders, but occasionally inquiries for other colours can be met, to small-quantities by residues from large runs.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

SINGLE- AND DOUBLE-POLE
(British Patents Nos. 367266 and 472748 apply)

LONG-EARTH-PATH HEAVY-DUTY TOGGLE-SWITCHES

THESE robust toggle switches are all made under an exclusive and patented BULGIN internal construction giving exceptionally long flash-distance between circuiting and earthable parts, which is useful particularly in peaky circuits and those having appreciable L. or C. values, or loads of non-unity P.F. There is negligible increase in external dimensions. Action is fully Q.M.B.-snap, and all terminals or tags are heavily SILVER-plated. All external parts are normally heavily Nickel-plated. For 6–250 V. circuits, peak Amps. as tabled, 750 V. max. test (2 KV. if insulatedly mounted), all figures at 50 ~. I.R. $\not<$ 40M Ω at 500 V. =, C.R. $\not>$ 0·01 Ω (10 m Ω) at 2 × rated Amps. at 2 V. Fixing : $\frac{1}{8}\frac{5}{2}$" ∅ × up to $\frac{11}{64}$" thickness Escutcheons, etc., see p. 127.



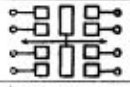
List No. S.279

List No. with terminals	IDEOGRAM	Poles	Switching	Peak* Amps
S.279		1	M.-B.	4
Description	Standard fixing bush for up to $\frac{11}{64}$" thickness, rear connections			

List No. S.300

List No. with Solder-tags	IDEOGRAM	Poles	Switching	Peak* Amps
S.300		2	M.-B.	4
Description	Standard fixing bush for up to $\frac{11}{64}$" thickness			

List No. S.302

List No. with Solder-tags	IDEOGRAM	Poles	Switching	Peak* Amps
S.302		2	C.-O.	3
Description	Standard fixing bush for up to $\frac{11}{64}$" thickness			

* May be doubled at 6–12 V. ' Peak ' = highest value during first 25 mS. of making or breaking the circuit.

All these models can also be supplied ' PEAR-DOLLY ' similar to types on page 110. Please add suffix "—/**PD**" to List No. Versions with INSULATED dolly only supplied BALL-dolly, not PEAR-dolly.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

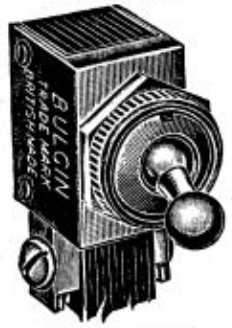
SINGLE-POLE
(British Patents Nos. 367266 and 472748 apply)
LONG-EARTH-PATH HEAVY-DUTY TOGGLE-SWITCHES

THESE robust toggle-switches are all made under an exclusive and patented BULGIN internal construction giving exceptionally long flash-distance between circuiting and earthable parts, which is useful particularly in peaky circuits or those having appreciable L. or C. values, or loads of non-unity P.F. They are thus suitable to control small A.C. or A.C.–D.C. Motors of up to about 1 or 1¼ A. *running*-current. There is negligible increase in external dimensions. Action is fully Q.M.B.-snap, and all terminals or tags are heavily SILVER-plated. All external parts are normally heavily Nickel-plated. For 6–250 V. circuits, peak Amps. as tabled, 750 V. max. test (2 KV. if insulatedly mounted), all figures at 50 ~. I.R. ≮ 40 M Ω at 500 V. ⎓, C.R. ≯ 0·01 Ω (10 m Ω) at 2 × rated Amps. at 2 V. Fixing : $\frac{15}{32}$" ⌀ × up to $\frac{11}{64}$" thickness Escutcheons, etc., see p. 127.

List No. S.263

STANDARD-BUSH MODEL

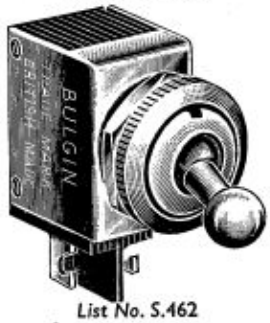
List No. with solder-tags	IDEOGRAM	Poles	Switching	Peak* Amps.
S.263		1	M.-B.	4
Description	Standard fixing bush for up to $\frac{11}{64}$" thickness			



List No. S.262

STANDARD-BUSH MODEL

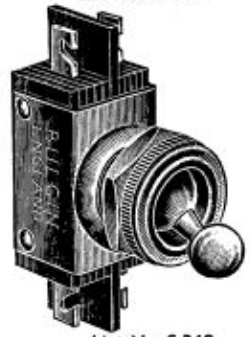
List No. with terminals	IDEOGRAM	Poles	Switching	Peak* Amps.
S.261		1	M.-B.	4
Description	Standard fixing bush for up to $\frac{11}{64}$" thickness			



List No. S.462

SHORT-BUSH MODEL

List No. with solder-tags	List No. with terminals	IDEOGRAM	Poles	Switching	Peak* Amps.
S.462	S.262		1	M.-B.	4
Description	Short fixing bush for 18 S.W.G. max. panels				



List No. S.369

STANDARD BUSH MODEL

List No. with Solder-tags	List No. with Terminals	IDEOGRAM	Poles	Switching	Peak* Amps.
S.369	S.369/ Terminals		1	2-way	3
Description	Standard fixing bush for up to $\frac{11}{64}$" panel-thickness, end tags				

* May be doubled at 6–12 V. ' Peak ' = highest value during first 25 mS. of making or breaking the circuit.

All these models can also be supplied ' PEAR-DOLLY ' similar to types on page 110. Please add suffix " —/**PD** " to List No. Versions with INSULATED dolly only supplied BALL-dolly, not PEAR-dolly.

ALL-MOULDED-INSULATION SINGLE-POLE Q.M.B. SNAP-ACTION TOGGLE-SWITCHES WITH PEAR-DOLLY

THESE entirely new BULGIN Miniature Toggle-Switches have been introduced to meet a need which will grow, for switches with all-moulded insulation and high test-voltage, with maintained high-insulation-M Ω even under adverse climatic conditions, or for switching to high-Ω 'loads'. They continue the firmly-established BULGIN reputation for reliable snap-toggle-Q.M.B. switches, meeting new needs.

List No. S.600/PD

List No S.601/PD

List No. S.602/PD

List No. S.603/PD

BRIEF SPECIFICATION

Moulded Body and internal insulation of Thermo-setting Bakelite to Grade II/M, R.C.S.1000. Brass-moving-and H.C.-copper-fixed-Contacts with heavy SILVER-plating (to R.C.S.1000/7/2/2/2 if requested, and ordered in quantity). External Metal parts heavily Nickel-plated, B.S.1224 (case = steel ; Bush, dolly, nuts Brass).

SINGLE-POLE, ON-OFF

List No.	IDEO-GRAM	Panel data : Max. thick-ness	Panel data : Hole Ø †	Panel Area Used Vertical	Panel Area Used Hori-zontal	Max. Amp Ratings* @ 6–12 V. ≅	Max. Amp Ratings* @ 110V. ~	Max. Amp Ratings* @ 250 V. ~
S.600 /PD		11/64" (4·4 mm.)	15/32" (11·9 mm.)	61/64" (24·2 mm.)	0·60" (15·3 mm.)	6 A.	5 A.	3 A.
WITH **SILVER**-PLATED SOLDER-TAGS AT REAR								

SINGLE-POLE, C.-O. ('2-WAY')

List No.	IDEO-GRAM	Panel data : Max. thick-ness	Panel data : Hole Ø †	Panel Area Used Vertical	Panel Area Used Hori-zontal	Max. Amp. Ratings* @ 6–12 V., ≅	Max. Amp. Ratings* @ 110 V. ~	Max. Amp. Ratings* @ 250 V ~
S.601 /PD		11/64" (4·4 mm.)	15/32" (11·9 mm.)	61/64" (24·2 mm.)	0·60" (15·3 mm.)	5 A.	3·5 A.	2 A.
WITH **SILVER**-PLATED SOLDER-TAGS AT REAR								

SINGLE-POLE, ON-OFF

List No.	IDEO-GRAM	Panel data : Max. thick-ness	Panel data : Hole †Ø	Panel Area Used Vertical	Panel Area Used Hori-zontal	Max. Amp. Ratings* @ 6–12 V. ≅	Max. Amp. Ratings* @ 110 V. ~	Max. Amp. Ratings* @ 250 V. ~
S.602 /PD		11/64" (4·4 mm.)	15/32" (11·9 mm.)	61/64" (24·2 mm.)	0·60" (15·3 mm.)	6 A.	5 A.	3 A.
WITH 6 B.A. SCREW TERMINALS AT REAR								

SINGLE-POLE, C.-O. ('2-WAY')

List No.	IDEO-GRAM	Panel data : Max. thick-ness	Panel data : Hole Ø †	Panel Area Used Vertical	Panel Area Used Hori-zontal	Max. Amp Ratings* @ 6–12 V., ≅	Max. Amp Ratings* @ 110 V. ~	Max. Amp Ratings* @ 250 V. ~
S.603 /PD		11/64" (4·4 mm.)	15/32" (11·9 mm.)	61/64" (24·2 mm.)	0·60" (15·3 mm.)	5 A.	3·5 A.	2 A.
WITH 6 B.A. SCREW TERMINALS AT REAR								

* Peak ; the max. current at any time within 25 mS. of starting to make or to break circuit.

Types with BALL-dolly are available to quantity orders only.

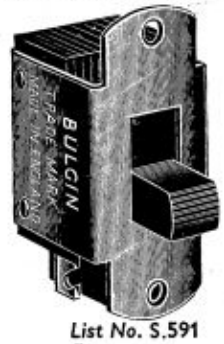
If versions to R.C.S.1000 in all details are required, please define fully, if for quantity orders. The *standard* STOCKED Versions are similar, but may not conform in every detail, though fully commercially TROPICAL D.C. uses should be agreed with us in every case. Proof test, 2 KV 50 ~.

I.R. ≮ 100M Ω (dry or recovered) @ 500 V. **M.**

SLIDE-ACTION-DOLLY Q.M.B. TOGGLE SWITCHES

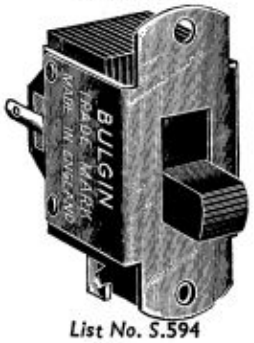
THESE **new** Slide-and-Snap-Action Moulded-dolly Toggle Switches have the popular BULGIN laminated bakelite insulation (for robustness and shock-resistance), steel-clad-case for strength, and the fully-snap reliable Q.M.B. Spring and roller-contact action, so long associated with these most reliable switches. The moulded dolly slides through $\frac{1}{4}$″ (6·35 mm.) and projects $\frac{9}{32}$″ (7·14 mm.) from switch-case front. Two-hole fixing :—(for 6 B.A.-clear or up-to-115″ø-rivets) @ $1\frac{5}{16}$″ (32·3 mm.). Panel-Area Occupied, $1\frac{9}{16}$″ (39·7 mm.) × $\frac{11}{16}$″ (17·5 mm.). All contacts and solder-tags heavily SILVER-plated.

Part No. 8298
Polished Aluminium & Matt Black finish

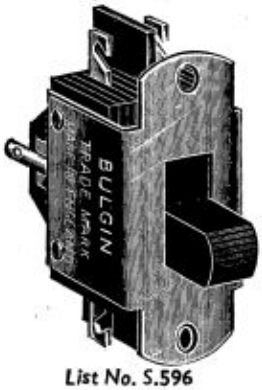


List No. S.591

List No. S.593



List No. S.594



List No. S.596

SINGLE-POLE, ON-OFF

List No.	IDEO-GRAM	Depth behind Panel	Max. Amp. Ratings* @ 6–12 V. ≅	Max. Amp. Ratings* @ 110 V. ~	Max. Amp. Ratings* @ 250 V. ~	6 B.A. Terminals, or Solder-Tags
S.590		$\frac{0.730}{0.721}$″ (18·3 mm.)	6	4	3	Terminals†
S.591						Tags

SINGLE-POLE, C.-O. ('2-WAY')

List No.	IDEO-GRAM	Depth behind Panel	Max. Amp. Ratings* @ 6–12 V. ≅	Max. Amp. Ratings* @ 110 V. ~	Max. Amp. Ratings* @ 250 V. ~	6 B.A. Terminals, or Solder-Tags
S.592		$\frac{0.730}{0.721}$″ (18·3 mm.)	5	3	2	Terminals†
S.593						Tags

DOUBLE-POLE, ON-OFF, & 4-POINT ON-OFF

List No.	IDEO-GRAMS	Depth behind Panel	Max. Amp. Ratings* @ 6–12 V. ≅	Max. Amp. Ratings* @ 110 V. ~	Max. Amp. Ratings* @ 250 V. ~	6 B.A. Terminals, or Solder-Tags
S.594		$\frac{0.971}{0.950}$″ (24·6 mm.)	2	2	1	Tags
S.595			1	1	1	Tags

DOUBLE-POLE, C.-O.

List No.	IDEO-GRAM	Depth behind Panel	Max. Amp. Ratings* @ 6–12 V. ≅	Max. Amp. Ratings* @ 110 V. ~	Max. Amp. Ratings* @ 250 V. ~	6 B.A. Terminals, or Solder-Tags
S.596		$\frac{0.971}{0.950}$″ (24·6 mm.)	2	2	1	Tags

* Peak ; the maximum current value during first 25 mS. after making or starting to break.

Suitable for all classes of light mains appliance and radio—and electronic-equipment. Reliable, and positive as to indication of position.

† Not illustrated.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(Q.M.B. SNAP-ACTION)

SPECIAL SINGLE-POLE Q.M.B. TOGGLE-SWITCHES FOR 6–250 V. CIRCUITS

ACKNOWLEDGED to be the best obtainable, these famous snap-action Toggle-Switches with Q.M.B. roller-contact action have best quality synthetic resin bonded paper-board insulation, SILVER-plated contacts with integral-tags or terminals for 18 S.W.G. max. or equivalent -stranded, and highly plated metal parts. Rated for 6–250 V. A.C. circuits, max. test voltage 750, 50 ~. Insulation-res., ⩽ 40M Ω, contact-res. ⩾0·01 Ω (10 m Ω) at 2 × rated amps. Fixing by $\frac{1}{3}\frac{5}{2}''$ ⌀ hole, preferably with re-entrant ' key ' $\frac{1}{3}\frac{}{2}'' \times \frac{1}{3}\frac{}{2}''$. A second nut is provided for fitting behind panel (⩾ $\frac{1}{6}\frac{1}{4}''$—for thicker panels ESCUTCHEON E.2, see p. 127 may be used) and should be retained at all times. Thread : 32 t.p.i., Whit. Indicating-plates can be supplied at extra cost—see p. 123. All models can be supplied with ' pear '-dolly ; some are shown on p. 106. Insulated dollies, ball or pear, are available to order—generally, in quantities—and insulated mounting and bush accessories are shown on p .123. Insulating these switches raises the test voltage *to E.* to 2 KV. (50 ~). I.R. is normally measured at 500 V. =, N.T.P. and R.-H.

List No. S.295

List No. with Solder tags	IDEO-GRAM	Switch-ing	Peak† Amps.	Description
S.295		M.-B.	3	As S.259, p. 109, but with short bush for 18 S.W.G. panels, and fitted short tags. Illustration inverted to show tags clearly

List No. S.299

List No. with Solder tags	IDEO-GRAM	Switch-ing	Peak† Amps.	Description
S.299		M.-B.	3	As S.259, p. 109, standard bush for $\frac{1}{4}\frac{}{4}''$ panels, no extension insulator between tags

List No. S.354

List No. with Solder tags	IDEO-GRAM	Switch-ing	Peak* Amps.	Description
S.354*		M.-B.	3	With standard bush, and insulated leads for connections

List No. S.304

List No. with Solder tags	IDEO-GRAM	Switch-ing	Peak† Amps.	Description
S.304*		M.-B.	3	With short bush, and insulated leads for connections

* With leads fitted to switch. † May be doubled at 6–12 V. ' Peak ' = highest value during first 25 mS. of making or breaking circuit.

Also available with ' PEAR-DOLLY ' similar to types on p. 110. Add suffix —/**PD** to List No. Versions with INSULATED dolly can only be supplied ' BALL-dolly', *not* ' PEAR- dolly'.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(Q.M.B. SNAP ACTION)

ALSO AVAILABLE WITH ' PEAR-DOLLY '* SIMILAR TO TYPES ON PAGE 110

Add Suffix —/PD to List No.

SINGLE-POLE Q.M.B. TOGGLE-SWITCHES FOR 6–250 V. CIRCUITS

ACKNOWLEDGED to be the best obtainable, these famous snap-action Toggle-Switches with Q.M.B. roller-contact action have best quality synthetic resin bonded paper-board insulation, silver-plated contacts with integral-tags or terminals for 18 S.W.G. max. or equivalent-stranded, and highly plated metal parts. Rated for 6–250 V. A.C. circuits, max. test voltage 750, 50 ~. Insulation-res., ≮ 40M Ω, contact-res. ≯ 0·01 Ω (10m Ω) at 2 × rated amps. Fixing by $\frac{11}{32}$"Ø hole, preferably with re-entrant ' key ' $\frac{1}{32}$" × $\frac{1}{32}$". A second nut is provided for fitting behind panel and should be retained at all times. Thread : 32 t.p.i., Whit. Indicating-plates can be supplied at extra cost—see p. 127. All models can be supplied with ' pear '-dolly ; some are shown on p. 110. Insulated dollies, ball or pear, are available to order—generally, in quantities—and insulated mounting and bush accessories are shown on p. 123. Insulating these switches raises the test voltage to E. to 2 KV. (50 ~). I.R. is normally measured at 500 V. ⎓, N.T.P. and R.-H.

List No. S.278

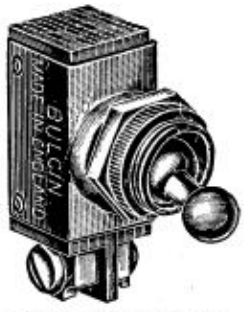
List No. with Terminals**	List No. with Solder-tags	IDEO-GRAM	Switching	Peak† Amps.	Description
S.278	—		M.-B.	3	Standard switch, for panels up to $\frac{11}{64}$" thickness, but rear connections

List No. S.260

List No. with Terminals**	List No. with Solder-tags	IDEO-GRAM	Switching	Peak† Amps.	Description
S.260	**S.318**		M.-B.	3	Standard switch, but short bush for 18 S.W.G. max. panel

List No. S.258/INS/I16

List No. with Terminals**	List No. with Solder-tags	IDEO-GRAM	Switching	Peak† Amps.	Description
S.258 Ins./ Black-† I.16	**S.259 Ins./ Black-‡ I.16**		M.-B.	3	Examples of S.258, 259 on p. 108, fitted with I 16 etc. (p. 127) and insulated dolly. Mounted, permits of over 2 KV. to panel, test voltage. Fits Panels up to $\frac{5}{32}$" thick.



List No. S.258/INS/5921

List No. with Terminals**	List No. with Solder-tags	IDEO-GRAM	Switching	Peak† Amps.	Description
S.258 /ins./ 5921- Black ‡	**S.259 /ins./ 5921- Black ‡**		M.-B.	3	Examples of S.258 259 on p. 108, fitted with P. No. 5921 (p. 127) and insulated dolly. Mounted, front of switch is fully insulated, but not from panel. Fits Panels up to $\frac{5}{16}$" thick.

* Versions with INSULATED dolly can only be supplied BALL-dolly not PEAR-dolly. † May be doubled at 6–12 V. ' Peak ' = highest value during first 25 mS. of making or breaking the circuit. ‡ Front moulded bush supplied in variety of colours, to quantity orders only. ** New type terminals as illustration *bottom* are now fitted.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

ON-OFF WITH PEAR-DOLLY AND ON-OFF BIASED

SINGLE-POLE Q.M.B. SNAP SWITCHES

THESE Toggle Switches, variants of the models in adjacent pages, include types with pear-dolly, and biased types, *all single-pole*. They are similarly suitable for 6–250 V., Amps. as tabled, 750 V. test (2 KV. if insulated), all as at 50 ~. They may similarly be used with accessories on page 127 and have normal metal finish highly Nickel-plated. I.R., normally measured at 500 V. = ≮ 40M Ω at N.T.P. and R.-H. Normal mounting to panels ≮ $\frac{11}{64}$″ thick by $\frac{15}{32}$″ ⌀ hole, preferably with re-entrant key $\frac{1}{32}$″ × $\frac{1}{32}$″.

The steel cases and brass bushes and dollies are heavily Nickel-plated and burnished; the contacts and tags are heavily SILVER-plated.

List No. S.259/PD

List No. with Solder-tags	IDEO-GRAM	Switching	Action and Dolly	Peak* Amps.	Description
S.259 /P.D.*		S.P., M.-B. (ON-OFF)	Pear-dolly, normal locking (non-biased) action	3	Standard type of ON-OFF switch, but with *pear-dolly*

* Version **T/S 259/PD (B.P.6)** is approved for U.S.A. and Canada to U.S.A., Joint Army and Navy Spec., No. JAN. S.23, Switch Type No. ST. 18A. (Limited).

List No. S.258/PD

List No. with Termi-nals	IDEO-GRAM	Switching	Action and Dolly	Peak* Amps.	Description
S.258 /P.D.		S.P., M.-B. (ON-OFF)	Pear-dolly, normal locking (non-biased) action	3	Standard type of ON-OFF switch, but with *pear-dolly*

List No. S.258/PD/Colour

List No. with Termi-nals	IDEO-GRAM	Switching	Action and Dolly	Peak* Amps.	Description
S.258 /P.D. /Ins./ Black		S.P., M.-B. (ON-OFF)	Pear-dolly, normal locking (non-biased) action	3	Standard type, metal dolly normally, with insulated front ring, black, Part No. 5921, fitted as standard

List No. S.271/PD & S.272/PD

List No. with Termi-nals	IDEO-GRAMS	Switching	Action and Dolly	Peak* Amps.	Description
S.271 /P.D.		S.P., M.-B. (ON-OFF)	Biased to OFF: Pear-dolly	3	Standard biased switch, pear dolly, with terminals
S.272 /P.D.		*ditto*	Biased to ON; Pear-dolly	3	*ditto*, reversed bias
S.260 /P.D.		*ditto*	Pear-dolly, normal locking (non-biased) action	3	*ditto*, with short (18 S.W.G. max. panel) bush

* May be doubled at 6–12 V. Peak = highest figure of current during first 25 mS. of making or breaking of circuit.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(Q.M.B. SNAP ACTION)

ALSO AVAILABLE WITH ' PEAR-DOLLY '* SIMILAR TO TYPES ON PAGE 106
Add Suffix —/PD to List No.

SINGLE-POLE Q.M.B. TOGGLE SWITCHES FOR 6–250 V. CIRCUITS

ACKNOWLEDGED to be the best obtainable, these famous snap-action Toggle Switches with Q.M.B. roller-contact action have best quality synthetic resin bonded paper-board insulation, SILVER-plated contacts with integral-tags or terminals for 18 S.W.G. max. or equivalent-stranded, and highly plated metal parts. Rated for 6–250 V. A.C. circuits, max. test voltage 750, 50 ~. Insulation-res., $\nless$ 40M Ω, contact-res. $\ngtr$ 0·01 Ω (10M Ω) at 2 × rated amps. Fixing by $\frac{15}{32}$"Ø hole, preferably with re-entrant ' key ' $\frac{3}{8}$" × $\frac{3}{16}$". A second nut is provided for fitting behind panel ($\ngtr \frac{11}{64}$"–for thicker panels ESCUTCHEON E.2, see p. 127 may be used) and should be retained at all times. Thread : 32 t.p.i., Whit Indicating-plates can be supplied at extra cost—see p. 127. All models can be supplied with ' pear '-dolly ; some are shown on p. 110. Insulated dollies, ball or pear, are available to order—generally, in quantities—and insulated mounting and bush accessories are shown on p. 127. Insulating these switches raises the test voltage to E. to 2 KV. (50 ~). I.R. is normally measured at 500 V. ═, N.T.P. and R.-H.

List No. S.258

List No. with Terminals	IDEO-GRAM	Switching	Peak† Amps.	Description
S.258		M.-B.	3	Standard switch, for panels up to $\frac{11}{64}$" thickness

List No. S.259

List No. with Solder tags	IDEO-GRAM	Switching	Peak† Amps.	Description
S.259		M.-B.	3	Standard switch, for panels up to $\frac{11}{64}$" thickness

List No. S.264

List No. with Terminals	IDEO-GRAM	Switching	Peak† Amps.	Description
S.264		C.-O.	2	Standard switch, for panels up to $\frac{11}{64}$" thickness

List No. with Solder-tags	IDEO-GRAM	Switching	Peak† Amps.	Description
S.265*		C.-O.	2	Standard switch, for panels up to $\frac{11}{64}$" thickness.
Version : **T/S 265/PD (BP.6)** is approved for U.S.A. and Canada to U.S.A., Joint Army and Navy Spec., No. JAN.S.23, Switch type No. ST.18D. (Limited).				

List No. S.368

List No. with Solder-tags	IDEO-GRAM	Switching	Peak† Amps.	Description
S.368		C.-O.	2	As S.265 above, but short bush for 18 S.W.G. max.

* Versions with INSULATED dolly can only be supplied BALL-dolly, not PEAR-dolly.
† May be doubled at 6–12 V. ' Peak ' = highest value during first 25 mS. of making or breaking the circuit.

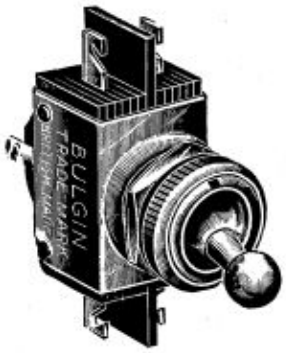
Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

Q.M.B. SNAP ACTION 'LOCKING' AND 'BIASED'

(METALLIC PEAR-DOLLY CAN BE FITTED TO ALL TYPES)

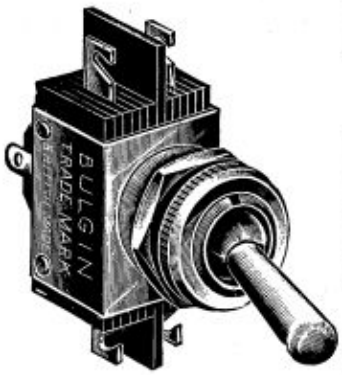
DOUBLE-POLE Q.M.B. TOGGLE SWITCHES FOR 6–250 V. CIRCUITS

IN accordance with wise, modern, safety requirements, double-pole switches are in greater demand than ever before. This page shows some change-over types. Made with insulation of finest grade S.R.B.P., and with SILVER-plated contacts. Integral solder-tags are provided and metal parts are highly nickel-plated. Q.M.B. action, for 6–250 V. circuits, A.C. or D.C. Tested : 750 V. *peak* (= 3 times working V.) : insulation res. $< 40M\Omega$; contact res. $= > 0{\cdot}01\ \Omega$ (10m Ω) at 2 × rated amps. Rated A. may be doubled at 6–12 V. Fixing by $\frac{13}{32}$"Ø hole, preferably with re-entrant 'key' $\frac{5}{32}$" × $\frac{1}{32}$". Panel thicknesses up to $\frac{11}{32}$" (except where stated)—for thicker panels ESCUTCHEON E.2, etc. (see p. 127) may be used. Ball-, Pear-, Slotted 'dollies' can be fitted and supplied where required quantities merit special production : some stock types are shown in adjacent pages.



List No. S.270

List No.	IDEO-GRAM	Switching	Peak Amps.	Notes
S.270*		C.-O.	1	Compound roller-action. Change-over switching



List No. S.270/PD

List No.	IDEO-GRAM	Switching	Peak Amps.	Notes
S.270 /P.D.*		C.-O.	1	Compound roller-action. Change-over
* Version : **T/S 270/PD (B.P.6)** is approved for U.S.A. and Canada to U.S.A. Joint Army and Navy Spec. No. JAN. S.23 Switch type No. ST.28N. (Limited).				

List No. S.301

List No.	IDEO-GRAM	Switching	Peak Amps.	Notes
S.301		C.-O.	2	As S.277, but change-over (= alternative-circuit)

List No.	IDEO-GRAMS	Switching	Peak Amps.	Notes
S.328		M.-B.	1	BIASED, otherwise as S.267 ; returns to 'Off'
S.329		M.-B.	1	BIASED, otherwise as S.267 ; returns to 'On'
S.330		4-pt. M.-B.	1	BIASED, otherwise as S.266 ; returns to 'Off'
S.452		C.-O.	1	As, S.270, but short-bush for 18 S.W.G. max. panels†
S.454		M.-B.	1	As S.267, but short-bush for 18 S.W.G. max. panels

Note.—†SHORT-BUSH switches cannot be biased. **PEAK AMPS** : may be doubled at 6–12 V. 'Peak' = highest current during first 25 mS. of making or breaking circuit. * Add '**P.D.**' to *any* List No. to obtain switch with PEAR-dolly.

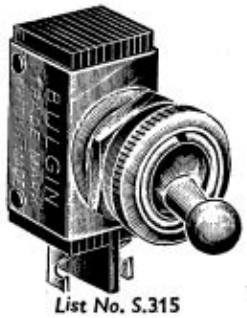
Versions in special materials/finishes (e.g. ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(ON-OFF AND ON-OFF BIASED)

MORE useful single and double-pole BULGIN Toggle Switches with single-pole biased-action (Ball-dolly types are shown ; *pear*-dolly types are always available—add " **/P.D.**" to chosen List No.) and with Double-pole non-biased action (called, sometimes, ' locking-action ').

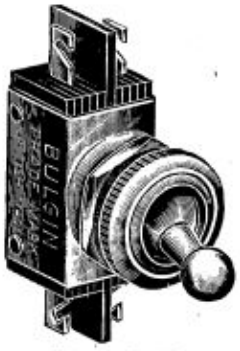
All types have highest grade Laminated bakelite insulation, highly nickel-plated metal parts and SILVER-plated tags, and contacts. Action is fully ' snap,' and Q.M.B.

Fixing by $\frac{15}{32}$"Ø hole, preferably with re-entrant ' key ' $\frac{1}{32}$" × $\frac{1}{32}$". Panel thickness up to $\frac{11}{64}$"—or thicker panels use ESCUTCHEON E.2 etc. (see page 127).



List No. S.315

List No.† with Terminals	List No.† with Solder-tags	IDEO-GRAMS	Switching	Notes	Peak* Amps.
S.271	**S.315**		S.P., M.-B. (ON-OFF)	Biased to OFF	3
S.272	**S.314**		*ditto*	Biased to ON	3



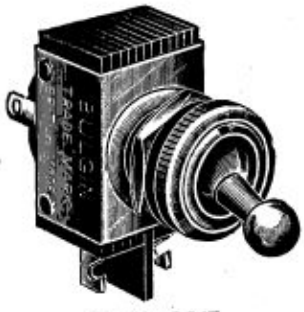
List No. S.273

List No.† with Terminals	List No.† with Solder-tags	IDEO-GRAM	Switching	Notes	Peak* Amps
S.274	**S.273**		S.P., C.-O.	Biased	2

List No.	IDEO-GRAM	Switching	Notes	Peak* Amps.
S.266		4-pt. M.-B.	Single roller-action. Connects together all 4 tags in ' On ' position	1

List No. S.277

List No.	IDEO-GRAM	Switching	Notes	Peak* Amps.
S.277		M.-B.	Two roller-action, general purpose, on-off†	3



List No. S.267

List No.	IDEO-GRAMS	Switching	Notes	Peak* Amps.
S.267		M.-B.	Compound roller-action. General purpose on-off	1
S.327		C.-O.	BIASED compound roller-action. Change-over	1

* May be doubled at 6–12 V. **PEAK AMPS** : ' Peak ' = highest current during first 25 mS. of making or breaking circuit. † Add ' **P.D.** ' to *any* List No. to obtain switch with PEAR-dolly.

SINGLE POLE TYPES

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

SLOTTED-DOLLY Q.M.B. MAINS TOGGLE SWITCHES

FOR 6–250 V. uses, rated at A.C. These reliable and familiar BULGIN Toggle Switches all have forked dollies for mechanical operation by $\frac{5}{64}$"Ø pins or equivalent, moving on $\frac{7}{16}$" radius. Average operating angle = 45°.

With finest quality construction, metal parts Nickel-plated, and insulation of highest grade S.R.B.P. sheet. Terminals or tags SILVER-plated for ease of soldering. Ampere ratings as listed, 6–250 V. Dry I.R. $\not<$ M Ω at 500 V. = Max. test V., 750 (3 × working). Mount on panels $\not>$ $\frac{3}{16}$" thick by $\frac{15}{32}$"Ø hole, with re-entrant location key ($\frac{1}{8}\frac{1}{2}$" × $\frac{1}{8}\frac{1}{2}$" approx.) if required, to key against rotation. Provided with back-nut which *must* be retained behind fixing-surface.

List No. S.259/SD

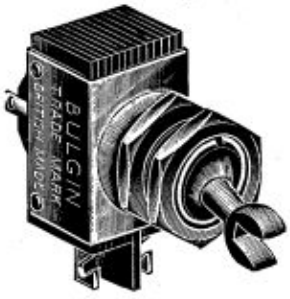
List No.	IDEO-GRAM	No. of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	Peak* Amps. at 110V. ~	Peak* Amps. at 250V. ~	Notes
S.259 /S.D.		1	M.-B.	Tags	6	4	3	For Panels $\frac{1}{16}$" thick

List No. S.263/SD

List No.	IDEO-GRAM	No. of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	Peak* Amps. at 110 V. ~	Peak* Amps. at 250V. ~	Notes
S.263 /S.D.		1	M.-B.	Tags	8	6	4	Long-internal-earth-path construction for low-Ω earthing For Panels $\frac{1}{16}$" thick

List No. S.265/SD

List No.	IDEO-GRAM	No. of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	Peak* Amps. at 110V. ~	Peak* Amps. at 250V. ~	Notes
S.265 /S.D.		1	C.-O.	Tags	4	3	2	For Panels $\frac{1}{16}$" thick



List No. S.266/SD

List No.	IDEO-GRAM	No. of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	Peak* Amps. at 110V. ~	Peak* Amps. at 250 V. ~	Notes
S.266 /S.D.		1	4-pt. M.-B.	Tags	2	1	1	For load grouping For Panels $\frac{1}{16}$" thick

* 'Peak' = highest current value during first 25 mS. of making or breaking the circuit.

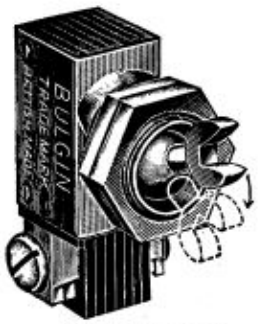
Special dollies are also manufactured for large-quantity single orders. For mounting accessories for all toggle switches, see p. 127.

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

SLOTTED-DOLLY Q.M.B. MAINS TOGGLE SWITCHES

FOR 6–250 V. uses, rated at A.C. These reliable and familiar BULGIN Toggle Switches all have forked dollies for mechanical operation by $\frac{5}{64}$"Ø pins or equivalent, moving on $\frac{7}{16}$" radius. Average operating angle = 45°.

With finest quality construction, metal parts Nickel-plated, and insulation of highest grade bakelite sheet. Terminals or tags, SILVER-plated for ease of soldering. Ampere ratings as listed, 6–250 V. Dry. I.R. ≮ 40M Ω at 500 V. = max. test V., 750 (3 × working). Mount on panels ≯ $\frac{3}{16}$" thick by $\frac{15}{32}$"Ø hole, with location key ($\frac{1}{32}$" × $\frac{1}{32}$" approx.) if required to key against rotation. Provided with back-nut which *must* be retained behind fixing-surface.



List No. S.271/SD

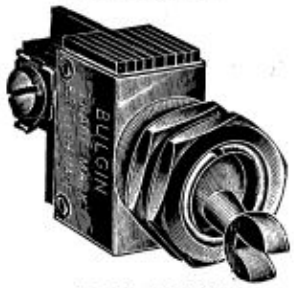
List No.	IDEO-GRAM	No.of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	110V. ~	250V. ~	Notes
S.271 /S.D.		1	M.-B.	Terminals	6	4	3	Biased to "OFF" For Panels $\frac{1}{16}$" thick

List No. S.272/SD

List No.	IDEO-GRAM	No.of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	110V. ~	250V. ~	Notes
S.272 /S.D.		1	M.-B.	Terminals	6	4	3	Biased to "ON" For Panels $\frac{1}{16}$" thick

List No	IDEO-GRAM	No.of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	110V. ~	250V. ~	Notes
S.301† /S.D.		2	C.-O.	Tags	6	4	2	D.P. C.O. action For Panels $\frac{1}{16}$" thick

† Not illustrated



List No. S.278/SD

List No.	IDEO-GRAM	No.of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	110V. ~	250V. ~	Notes
S.278 /S.D.		1	M.-B.	Rear Terminals	6	4	3	Useful in confined spaces For Panels $\frac{1}{16}$" thick

List No. S.261/SD

List No.	IDEO-GRAM	No.of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	110V. ~	250V. ~	Notes
S.261 /S.D.		1	M.-B.	Terminals	8	6	4	Long-internal-earth-path construction for low-Ω earthing For Panels $\frac{1}{16}$" thick

* 'Peak' = highest current value during first 25 mS. of making or breaking the circuit.

DOUBLE-POLE TYPES

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

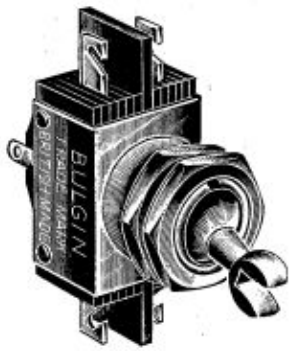
SLOTTED-DOLLY Q.M.B. MAINS TOGGLE SWITCHES

FOR 6–250 V. uses, rated at A.C. These reliable and familiar BULGIN Toggle Switches all have forked dollies for mechanical operation by $\frac{5}{64}$"Ø pins or equivalent, moving on $\frac{7}{16}$" radius. Average operating angle = 45°. All on this page are DOUBLE-pole types.

With finest quality construction, metal parts Nickel-plated, and insulation of highest grade S.R.B.P. sheet. Terminals or tags SILVER-plated for ease of soldering. Ampere ratings as listed, 6–250 V. Dry. I.R. ≮ 40M Ω at 500 V. = max. test V., 750 (3 × working). Mount on panels ≯ $\frac{3}{16}$" thick by $\frac{15}{32}$"Ø hole, with location key ($\frac{1}{32}$" × $\frac{1}{32}$" approx.) if required to key against rotation. Provided with back-nut which *must* be retained behind fixing-surface.

List No. S.267/SD

List No.	IDEO-GRAM	No. of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	110 V. ~	250 V. ~
S.267/S.D.		2	M.-B.	Tags	1	1	1



List No. S.270/SD

List No.	IDEO-GRAM	No. of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	110 V. ~	250 V. ~
S.270/S.D.		2	C.-O.	Tags	1	1	1

List No. S.277/SD

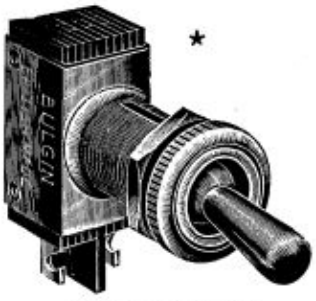
List No.	IDEO-GRAM	No. of Poles	Switching	Connections	Peak* Amps. at 6 V. ~	110 V. ~	250 V. ~
S.277/S.D.		2	M.-B.	Tags	6	4	3
Note : Heavy duty double-pole model							

* 'Peak' = highest current value during first 25 mS. of making or breaking the circuit.

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

LONG-BUSH, SINGLE AND DOUBLE-POLE

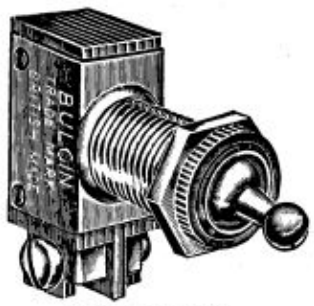
THESE new additions to the already extensive BULGIN Range cover normal and popular-contacting-combination Toggle-Switches, Q.M.B., with either long-fixing bushes, for panels $\not> \frac{35}{64}$" thick. All fully insulated from case, and suitable for 6–250 V. (i.e., Automobile as well as mains uses). One-hole fixing by $\frac{15}{32}$" ⌀ hole (with approx. $\frac{1}{32}$" × $\frac{1}{32}$" key if location be needed). Tested at 750 V. (= max. test V.) Dry I.R. $\not< 40$ M Ω at 500 V. Highly plated Nickel-finish to all external metal parts, soldering-tags and terminals, SILVER-plated. Extra-long bush types all fitted with tags for connections.



List No. S.400/PD ★

List No. S.400

List No. S.404



List No. S.401

LONG-BUSH TYPES, For panels up to $\frac{35}{64}$" thickness		Contacting and IDEOGRAM		No. of poles	Max. Peak* Amps. @		
With Terminals List No.	With Solder-tags List No.				6–25 V. ~	up to 110 V. ~	up to 250 V. ~
S.401	S.400	M.-B.		1	6	4	3
S.403†	—	M.-B.		1	6	4	3
—	S.402	2-way		1	4	3	2
—	S.404	M.-B.		2	2	1·5	1
—	S.405	C.-O.		2	2	1·5	1

Notes

Plain locking action, not biased.

* Peak = Max. value of current within 25 mS. of making or breaking circuit.

† *Rear* terminals.

Fix : by $\frac{15}{32}$"⌀ hole, preferably with $\frac{1}{32}$" × $\frac{1}{32}$" re-entrant 'key' to panels up to $\frac{35}{64}$" thick.

Retain the hex.-nut behind panel.

★ The above switches are fitted with metal ball-dolly as standard, but all may have metal pear-dolly substituted. Please add "—/PD" to List No., as example illustrated.

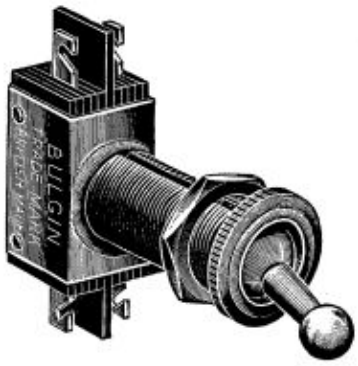
At the present time, INSULATED or FORKED-DOLLIES cannot be supplied for these *long-bush* switches, except to large quantity single-orders.

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

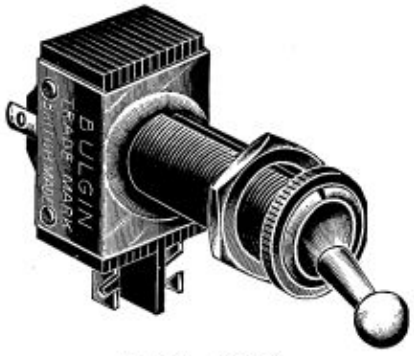
EXTRA-LONG-BUSH, SINGLE AND DOUBLE-POLE

THESE extra-long bush models cover the most popular BULGIN contacting combinations. Designed to fit to extra thick panels up to $\frac{5}{64}$" thick. Fully insulated from case, and suitable for 6–250 V. Standard BULGIN one-hole fixing ($\frac{1}{3}\frac{5}{2}$"Ø hole with $\frac{1}{32}$" × $\frac{1}{32}$" key). Tested at 750 V. (= max. test V.) Dry I.R. ≮ 40M Ω at 500 V. =. Highly plated Nickel-plated finish to all external metal parts, terminals and tags and contacts SILVER-plated.

List No. S.480



List No. S.482



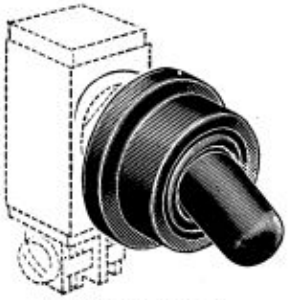
List No. S.483

EXTRA-LONG-BUSH TYPES, For panels up to $\frac{5}{64}$" thickness: With Terminals List No.	With Solder-tags List No.	Contacting and IDEOGRAM		No. of poles	Max. Peak* Amps. @ 6–25 V. ~	up to 110 V. ~	up to 250 V. ~
Can be made specially, to Quantity order ; List Nos. on right, and suffix : /TERM'LS	S.480	M.-B.		1	6	4	3
	S.482	2-way		1	4	3	2
	S.483	M.-B.		2	2	1·5	1
	S.485	C.-O.		2	2	1·5	1
	S.490	M.-B.		1	6	4	3
	S.491	M.-B.		1	6	4	3
	S.492	2-way		1	4	3	2
	S.493	M.-B.		2	2	1·5	1
	S.494	M.-B.		2	2	1·5	1
	S.495	C.-O.		2	2	1·5	1

List No.	Notes and Action	
S.480–485	Plain locking action, not biased	
S.490	Biased to OFF	* Peak = Max. value of current within 25 mS. of making or breaking circuit.
S.491	Biased to ON	
S.492	Biased	Fix : by $\frac{1}{3}\frac{3}{2}$"Ø hole, preferably with $\frac{1}{32}$" × $\frac{1}{32}$" re-entrant ' key ' to panels up to $\frac{5}{64}$" thick.
S.493	Biased to OFF	
S.494	Biased to ON	*Retain* hex.-nut behind panel.
S.495	Biased	

MOULDED WATERPROOF FLEXIBLE COVER FOR SPLASH-PROOFING TOGGLE SWITCHES WITH PEAR-DOLLIES

THIS New Flexible P.V.C. Moulded Waterproof cover has internal threaded brass bush $\frac{1}{3}\frac{8}{2}$"Ø, 32 t.p.i. and screws on to the front of the bush of all BULGIN dolly (lever) type Toggle-Switches, in front of the standard front-of-panel knurled-ring fixing nut. The bush should protrude $\frac{3}{3}\frac{}{2}$"–$\frac{1}{8}$" from the ring-nut ; thus max.-panel thickness for switches then drops *by* $\frac{3}{3}\frac{}{2}$"–$\frac{1}{8}$". Primarily designed for switches with *Pear*-dolly (add " /P.D." to List No. of chosen switch), but can also be used with *Ball*-dolly types. When fixed, the action of the Switch is in no way impeded, and positional-indication by the dolly position can still be seen, but the entry-' neck ' or bush of the Switch is fully sealed against ingress of dust or water under normal atmospheric conditions up to 7 lbs./sq.-in. pressure difference at normal temperatures.



Dolly-cover only, List No. S.550
Fits to all BULGIN Pear-Dolly Switches

Also useful for *insulating* the front of a switch entirely. Moulded in highly flexible P.V.C., colour RED or BLACK. (Please add desired colour to List No., *thus* "(*List No.*) /S.550—RED.") Avoid temperatures below + 5° C. or exceeding + 40° C., or ask for special type.

Switch List No. S.258/P.D. with S.550 Dolly-cover ; Order as :—
" S.258/P.D./S.550-Black"

List No.	Max. Ø	Max. front Projection	Threading
S.550/RED	$\frac{2}{3}\frac{7}{2}$"	$\frac{6}{6}\frac{1}{4}$"	32 t.p.i Whit., $\frac{3}{8}\frac{}{2}$" depth of thread
S.550/BLACK			

Remember :— allow $\frac{3}{3}\frac{}{2}$"–$\frac{1}{8}$" switch-bush protrusion at panel-front ; longer-bush switches (listed in adjoining pages) may be required.

FRONT-INSULATING AND MOUNTING-INSULATING ACCESSORIES FOR TOGGLE-SWITCHES

MOULDED, PANEL-INSULATING, CUP-ESCUTCHEON

THIS accessory is rear-threaded $\frac{1}{3}\frac{3}{2}$" Whit. 32 t.p.i., to suit the fixing bushes of all Toggle switches. It comes complete with large rear-of-panel washer. Use the rear-most hex. nut of the switch, but discard the front nut. Panel-hole to be $\frac{1}{1}\frac{3}{6}$"Ø. Max. panel thicknesses, $\frac{1}{2}^{6}$ approx. Preferably, the Toggle Switch should have INSULATED dolly, detail 4 or detail 5 of p. 98, or be a Rotary type. **List No. E.14.**

List No. E.14

MOULDED, SHROUDING, FRONT RING-NUT

THIS accessory, also used with Toggle Switches when (preferably) fitted with insulating dollies details 4, 5 (p. 98), or Rotary types, does not insulate the fixing bush from the panel, but shrouds the bush-front. Panel hole remains at $\frac{1}{3}\frac{5}{2}$"Ø. The metal front ring-nut of the switch is discarded.

List No. P/N. 5921

Part No. 5921

List Nos. 1.21, 1.16

MOULDED, PANEL-INSULATING, FRONT-NUT

THIS accessory comes complete with rear-of-panel washer. It covers the nose of the switch-bush, and also insulates the bush from panel. The panel hole becomes $\frac{3}{8}$"Ø, with max. thickness of panel, $\frac{1}{8}$". Insulating dollies (details 4, 5, p. 98) are preferable for the switches.

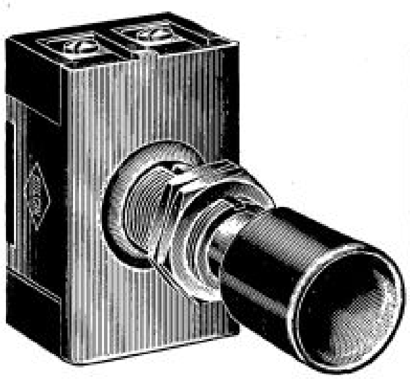
List No. 1.16, Front Member (stepped)
List No. 1.21, Rear washer (stepped)

Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

SUCCESSIONAL-ACTION SWITCHES

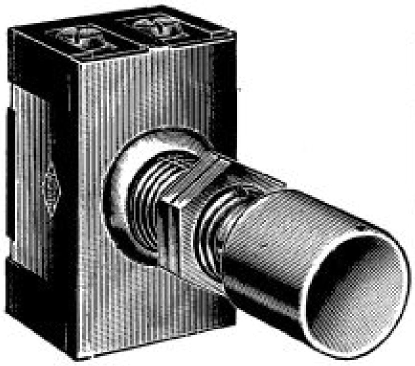
(PUSH-PUSH SINGLE-POLE APPLIANCE SWITCHES)

THESE reliable push-push or successional action appliance or apparatus-switches, suitable for suction-cleaners, hair-dryers, etc., fix by single $\frac{15}{32}$"ø hole, to panels ≯ $\frac{15}{32}$" thick, and operate by $\frac{1}{4}$" displacement at $4\frac{1}{2}$ lb. min., $6\frac{1}{2}$ lb. max., pressure. Fitted with large black rubber knob (captive, but easily removed for mounting the switch) or Erinoid, or Nickel-plated knob. Rear-of-panel space, approx. $1\frac{1}{2}$" × 1", × $\frac{15}{16}$" min. rear projection. End terminals for connections. Working, 250 V. ~ max., 2 A. max. (4·5 A. short max. peak), for loads of 1–0·7 p.f. Tested, 1 KV. to E. Highly reliable, these switches are used on thousands of appliances, and also in Automobiles.



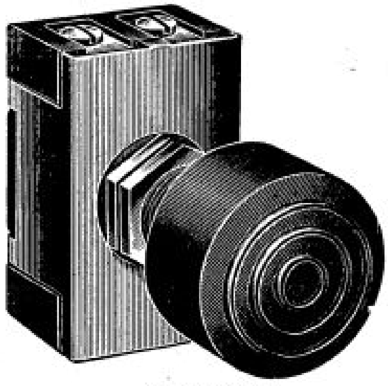
List No. S.560

List No.	IDEO-GRAM	No. of Poles	Con-tacting	Connections	Peak* Amps. at		
					6 V.	110V.	250V.
S.560		1	M.-B.	6 B.A. Terminals	6	3	2
Notes	Polished black Erinoid Knob						



List No. S.561

List No.	IDEO-GRAM	No. of Poles	Con-tacting	Connections	Peak* Amps. at		
					6 V.	110V.	250V.
S.561		1	M.-B.	6 B.A. Terminals	6	3	2
Notes	Polished Nickel-plated Knob						



List No. S.360

List No.	IDEO-GRAM	No. of Poles	Con-tacting	Connections	Peak* Amps. at		
					6 V.	110V.	250V.
S.360		I	M.-B.	6 B.A. Terminals	6	3	2
Notes	Black Rubber Knob						

* 'Peak' = max. current during first 25 mS. of making or breaking circuit.

†All the above Switches have flat connection-head type 6 B.A. clamp-screw terminals to accept cables up to 3/0·022", or 23/36 S.W.G. flexible

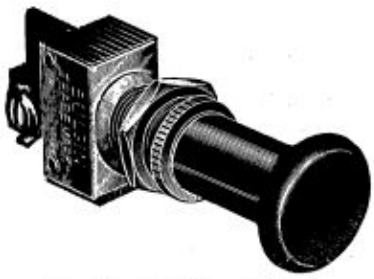
Versions in special materials/finishes (e.g., 'Tropical' or Specificational) may be manufactured to special quantity orders.

(PUSH-PULL LAMINATED ACTION SWITCHES)

Q.M.B. TOGGLE ACTION SWITCHES, PUSH-PULL MODELS

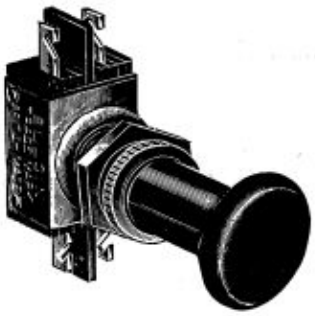
THESE recent additions to the already extensive BULGIN Range cover normal and popular-contact!ng-combination push-pull types, all fully insulated from case, and suitable for 6–250 V. (i.e., Automobile as well as mains uses). One-hole-fixing by $\frac{5}{32}$″ ø hole (with approx $\frac{1}{32}$″ × $\frac{1}{32}$″ key if location be needed) to panels up to $\frac{23}{64}$″ thick.* Tested at 750 V. (= max. test V.) Dry I.R. ≮ 40M Ω at 500 V. Highly plated Nickel-plated finish to all external metal parts, soldering-tags and terminals, SILVER-plated. Knobs normally black polished moulded Bakelite. Fully Q.M.B. Snap-action with positive positions. Knobs remove for mounting the switches.

* Mounting fitments for thicker panels, see p. 127.



List Nos. S.220 and S.390

List No.	IDEO-GRAM	No.of Poles	Con-tacting	Connections	Amps. @ 6 V. ~	110V. ~	250V. ~
S.220		1	M.-B.	Rear Terminals	6	4	3
S.444*		1	M.-B.	Tags	6	4	3
Notes	Pull for "ON"						



List No. S.445

List No.	IDEO-GRAM	No.of Poles	Con-tacting	Connections	Amps. @ 6 V. ~	110V. ~	250V. ~
S.390		1	M.-B.	Rear Terminals	6	4	3
S.443		1	M.-B.	Tags	6	4	3
Notes	Pull for "OFF"						

List No. S.446

List No.	IDEO-GRAM	No.of Poles	Con-tacting	Connections	Amps. @ 6 V. ~	110V. ~	250V. ~
S.445		1	C.-O.	Tags	4	3	2
Notes	Pull for change-over						

The ¾"ø Polished Knob mounting projects 1$\frac{1}{16}$", which unscrews for mounting the switch to panel

* Not illustrated.

List No.	IDEO-GRAM	No.of Poles	Con-tacting	Connections	Amps. @ 6 V. ~	110V. ~	250V. ~
S.447*		2	M.-B.	Tags	1	1	1
Notes	Pull for "OFF"						
S.448*		2	M.-B.	Tags	1	1	1
Notes	Pull for "ON"						
S.446		2	C.-O.	Tags	1	1	1
Notes	Pull for change-over						

HEAVY-DUTY D.P. LEVER SWITCHES

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

(D.P. ON-OFF SWITCHES FOR APPLIANCES)

LEVER OR TOGGLE-ACTION MOULDED DOUBLE-POLE ON-OFF Q.M.B. APPLIANCE SWITCHES

THESE double-pole switches have high current ratings, and are suitable for all types of electrical appliances, loads of 1–0·7 p.f., peak ratings as listed below, for 6–250 V. circuits. With substantial 6 B.A. terminals for max. 3/0·022 cable or equivalent, and highest grade insulation. Max. test voltage, 2 KV. peak. Dry I.R. $\not<$ 40M Ω at 500 V. ⎓. With normally black moulded thermo-setting dollies or levers, and heavily SILVER-plated contacts and terminals. Escutcheons are available, and **Part No. 6363** escutcheon, on p. 127 fits Switch S.377. Suitable for all classes of electrical appliances and arduous heavy-duty work of all descriptions, being most ruggedly constructed. This all-moulded-Bakelite model, S.377 is highly moisture-resistant, and has good shock-resistance. It is suitable for Continental Market, and for all D.P. ON-OFF-switching of appliances which may not be earthable, and which *must* be quite ' *safe.*'

List No. S.377

List No. S.377 with Part No. 6363 Escutcheon-plate

List No.	Contacting	Description
S.377	D.P. Make-break	Moulded thermo-setting structure, O.A. dims., rear of panel :—1½" × ⅜" × 1 1/16" (38 mm. × 17 mm. × 37 mm.)

Fixing	Max. Peak† A. at 6 V. ≂	Max. Peak† A. at 250 V. ~	Max. Peak† A. at 250 V. ⎓
2 × 6 B.A. threaded at 1⅛" (28·5 mm.) symmetrical crs.	12	6	3

Part No. 6363	Chromium-plated and black metal escutcheon for S.377 switches, fully illustrated on p. 127.

† ' Peak ' = max. current during first 25 mS. of making or breaking circuit.

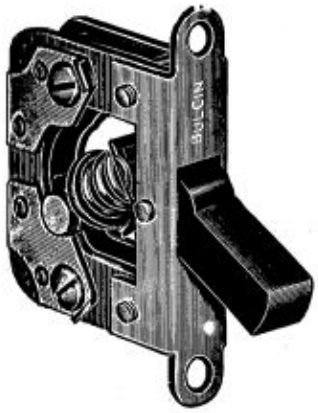
Other *heavy duty* Appliance-Switches are shown on pp. 116, 120, 123, 124.

Be Safe ! The two-pin plug may be reversible, and either lead then be 'live' in turn ; fit a DOUBLE-pole Switch.

SWITCHES FOR APPLIANCES

LEVER OR TOGGLE-ACTION S.P.C.-O. Q.M.B. APPLIANCE SWITCHES

THESE single-pole change-over or two-way switches have high current ratings, and are suitable for all types of electrical appliances, loads of 1–0·7 p.f., peak ratings as listed below, for 6–250 V. circuits. With substantial 6 B.A. terminals for max. 3/0·022 cable or equivalent, and highest grade insulation. Max. test voltage, 2 KV. peak. Dry. I.R. $\not<$ 40M Ω at 500 V. ⎓. With normally black moulded thermo-setting dollies or levers, and heavily SILVER-plated contacts and terminals. Escutcheons are available, and List No. E.12 on p. 127 suits. Suitable for all classes of electrical appliances and arduous heavy-duty work of all descriptions, being most ruggedly constructed. The glazed porcelain model is the more moisture-resistant ; the S.R.B.P. model, on the other hand has the greatest resistance to mechanical shock.

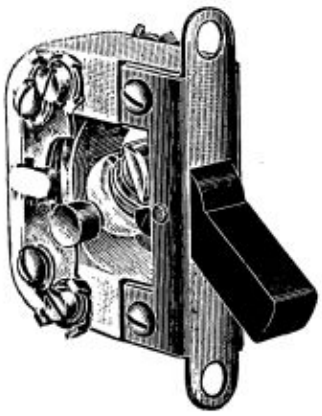


List No. S.395

S.P.C.-O.

List No.	Contacting	Description
S.395	S.P. two-way or change-over	*Cd.*-plated steel frame with high-grade S.R.B.P. insulation. O.A. dims., rear of panel :— $2\frac{1}{8}$" × $\frac{5}{8}$" × $1\frac{1}{4}$"

Fixing	Max. Peak† A. at 6 V. ⎓	Max. Peak† A. at 250 V. ~
Two $\frac{1}{16}$"Ø holes at symmetrical $1\frac{13}{16}$" crs.	10	4



List No. S.55

CERAMIC-INSULATION S.P.C.-O.

List No.	Contacting	Description
S.55	S.P. two-way or change-over	*Cd.*-plated steel frame with glazed porcelain frame. *Ag.*-plated terminal screws. O.A. dims., rear of panel :—$2\frac{1}{8}$" × $\frac{5}{8}$" × $1\frac{1}{4}$"

Fixing	Max. Peak† A. at 6 V. ⎓	Max. Peak† A. at 250 V. ~
Two $\frac{1}{16}$"Ø holes at symmetrical $1\frac{13}{16}$" crs.	8	3

E.12	Moulded Escutcheon, fully described and illustrated on p. 127, for S.53, 55, Switches ; normally **BLACK**

† ' Peak ' = max. current during first 25 mS. of making or breaking circuit.

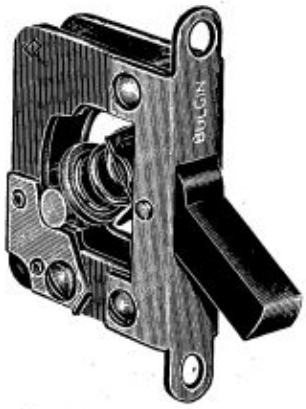
For Mounting Escutcheon on Front-of-Panel, see E.12 on p. 127.

Widely used in all classes of appliance and equipment, these switches have an unequalled record of reliable and trouble-free service.

SWITCHES FOR APPLIANCES

LEVER OR TOGGLE ACTION S.P. ON-OFF Q.M.B. APPLIANCE SWITCHES

THESE single-pole on-off switches have high current ratings, and are suitable for all types of electrical appliances, loads of 1–0·7 p.f., peak ratings as listed below, for 6–250 V. circuits. With substantial 6 B.A. terminals for max. 3/0·022 cable or equivalent, and highest grade insulation. Max. test voltage, 2 KV. peak. Dry I.R. ≮ 40M Ω at 500 V. ⎓. With normally black moulded thermo-setting dollies or levers and heavily SILVER-plated contacts and terminals. Escutcheons are available, and List No. E.12 on p. 127 suits. Suitable for all classes of electrical appliances and arduous heavy-duty work of all descriptions, being most ruggedly constructed. The glazed porcelain model is the more moisture-resistant ; the S.R.B.P. model, on the other hand, has the greatest resistance to mechanical shock.

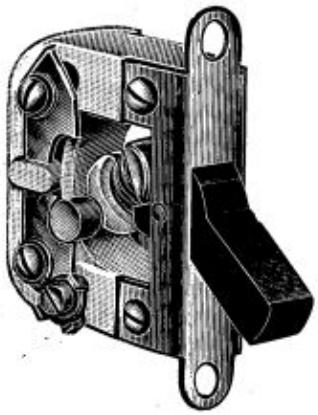


List No. S. 393

S.P. ON-OFF

List No.	Contacting	Description
S.393	S.P. Make-break	*Cd.*-plated steel frame with high-grade S.R.B.P. insulation. O.A. dims., rear-of-panel :—2⅛" × ⅝" × 1¼"

Fixing	Max. Peak† A. at 6 V. ⎓	Max. Peak† A. at 250 V. ~
Two $\frac{5}{16}$"Ø holes at symmetrical 1 $\frac{13}{16}$" crs.	12	5



List No. S. 53

CERAMIC INSULATION S.P. ON-OFF

List No.	Contacting	Description
S.53	S.P. Make-break	*Cd.*-plated steel frame with glazed porcelain frame. *Ag.*-plated terminal screws. O.A. dims., rear of panel :— 2⅛" × ⅝" × 1¼"

Fixing	Max. Peak† A. at 6 V. ⎓	Max. Peak† A. at 250 V ~
Two $\frac{5}{16}$"Ø holes at symmetrical 1 $\frac{13}{16}$" crs.	10	4

E.12	Moulded Escutcheon, fully described and illustrated on p. 127 for S.53, 55, 393, 395 Switches ; normally **BLACK**

† 'Peak' = max. current during first 25 mS. of making or breaking circuit.

For Mounting Escutcheon on Front-of-Panel, see E.12 on page 127

Widely used in all classes of appliance and equipment, these switches have an unequalled record of reliable and trouble-free service.

AUTOMOBILE AND SPECIAL SWITCHES

THE special switches shown on this page are all of types designed for particular applications and uses tabled below. All are made with the usual BULGIN attention to points of highest quality insulation, with large and rugged contacting surfaces, strong and unfailing action and contacting, giving reliable and long-lived service. The different types are tabled below.

List No.	IDEO-GRAM	Description		Operation and Switching		Current and Voltage Range	
						Volts	Amps.†
M.P.1		RED	Push-switch, 'live' fixing bush (⅜" clear ∅ hole, panels up to ⅛" thick)	Press for 'on.' Length of stroke = panel thickness, + 1/32" approx.	S.P.M.-B. normally 'off'	0·1 to 24	3 MAX.
M.P.2		BLACK					
M.P.3		WHITE					
Applications and further details		General-duty small push-for-'on' (spring-return) switch with 1-pole the fixing bush. For all low-voltage temporary-make (or, make-circuit only when pressed) uses: voltmeter readings, bell- and signal-circuits, etc.					

List No.	IDEO-GRAM	Description		Operation and Switching		Current and Voltage Range	
						Volts	Amps.†
M.P.7		RED	Ditto, with mushroom head knob	Ditto	Ditto	0·1 to 24	3 MAX.
M.P.8		BLACK					
M.P.9		WHITE					
Applications and further details		General-duty small push-for-'on' (spring-return) switch with 1-pole the fixing bush. For all low-voltage temporary-make (or, make-circuit only when pressed) uses: voltmeter readings, bell-and signal-circuits, etc.					

List No.	IDEO-GRAM	Description	Operation and Switching	Current and Voltage Range	
				Volts	Amps†
M.P.12 black		One hole, 'dead' fixing to ⅜"∅ holes, with max. panel thickness of 13/32". Chrome-bezel, black push-button	S.P. normally 'OFF' (push for 'ON') Self-clearing contacts	Max. 110, 50 ~	1A. at 110V.; 2 A @ 12 V.
Applications and further details		General-duty, push for 'ON,' spring-return. For up to 110 V. a.c., for 'Make-circuit only when pressed' uses.			

List No.	IDEO-GRAM	Description	Operation and Switching		Current and Voltage Range	
					Volts	Amps.†
S.38		Push-pull, low-voltage, 1-hole (¼"∅) fixing (panels ≯ ⅛" thick)	Snap :— Push (OFF) Pull (ON)	S.P. M.-B., bush 'live' in 'on' position	20 MAX.	2 MAX.
Applications and further details		General low-voltage uses. Popular for over 24 years, and still in constant demand				

* Rated as for 50 ~. † Peak : the max. value of current flowing in circuit upon making or breaking, whilst the switch contacts are operating.

AUTOMOBILE AND SPECIAL SWITCHES

THE special switches shown on this page are all of types designed for particular applications and uses tabled below. All are made with the usual BULGIN attention to points of highest quality insulation, with large and rugged contacting surfaces, strong and unfailing action and contacting, giving reliable and long-lived service. The different types are tabled below.

"STRIP", SWITCH

List No.	IDEO-GRAM	Description		Operation and Switching		Current and Voltage Range	
						Volts	Amps.
S.451		VERTI-CAL	All-moulded snap-switches See below for fixing de-tails	Lever, snap	S.P.M.-B.	6–250	3 A., 6–12 V.; 1 A.; 125 V.; ½ A., 250 V.
S.451-H		HORI-ZON-TAL*					
Applications and further details :—		All moulded all-insulated switch for light mains-uses, low voltage automobile uses, etc. Ideal for car-interior lights, etc. Normally BLACK. Fix 2 × 4 B.A. at 1⅜" crs., with central pass-aperture 1 11/16" × 7/16", radiused-ended					

* Not illustrated, but identical, *with legends turned* 90°.

Models S.451 and S.451-H are neat and efficient for motor-cars, caravans, etc., where they are widely used. They are also excellent for up to ½ A., up to 250 V., A.C. mains uses (*not* D.C. mains), for they are FULLY INSULATED, and thus illustrate the good factor of safety that the BULGIN Organisation puts into a primarily low-voltage component !

PUSH-PULL & PUSH DASH-BOARD SWITCHES

List No	IDEO-GRAM	Description	Operation and Switching		Current and Voltage Range	
					Volts	Amps.
S.468		Dust-proof single-pole switches ideal for auto-mobile circuits and all low-voltage uses	Push-pull (Pull for ON)	Single pole	6–12 12–24	6 3
S.469			Push; (Push for ON ; biased OFF)			
S.470			Push-pull (Pull for OFF)			
Applications and further details :—		A new range of dust-proof metal-clad single-pole switches of easy operation, for application especially on automobile circuits. Powerful construction gives an unequalled life-time of service				

HERE we list a selection of accessories for the switches on the preceding pages : Plate-Escutcheons for Lever-Switches. Insulating-bushings for Toggle-lever and Rotary-switches, indication-plates, and Sunk-escutcheons.

SWITCH ACCESSORIES

ESCUTCHEONS E.12, normally BLACK, are used only with S.53, 55, 393, 395 (p. 122 & 124). Part No. 6363 is used only with S.377 (p. 122), and is normally black and chrome. They involve no extra or separate fixing. Part No. 5921 and I.16 and E.14 (normally BLACK), bush and insulate all toggle switches with $\frac{1}{32}$"Ø 32 t.p" bushes, and I.21 is a rear-of-panel washer for them. Part No. 6137, normally *Ni.*-plated, and E.2, 13, are metal, used with thick panels. E.14 is used with thick panels, with insulating benefit also. Part Nos. 3794 etc., label all lever- or dolly-toggle-switches, only when non-insulated mounting is employed, without escutcheons.

List No. E.12

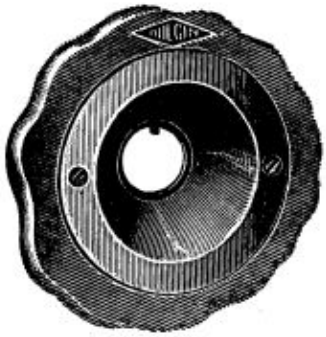
Part No. 6137

List or Part No.	Description		Use
E.12	Moulded, black	Escutcheons	S.53, 55, 393, 395 — pp. 122–124
P/6363	Metal, black and chrome		S.377 — pp. 122–124
P/3789	T.C./SET	(See Illustrn. P/No. 3794) Metal Indication-Plate, normally *Ni.*-plated. Other finishes by arrangement	All toggle switches with lever or dolly operation, in normal mounting uses
P/3791	LONG/SHORT		
P/3792	1/2		
P/3793	H.T./L.T.		
P/3794	OFF/ON		
P/3795	ON/OFF		
P/No. 8780	Circular disc escutcheon, printed 'ON' 'OFF' in black, with circular band, on frosted aluminium; $\frac{15}{32}$" Ø central hole, O.A.Ø $1\frac{5}{8}$". Fits under fixing nut of switch		With switches (on-off) ex pp. 99, 100 & 101

Part No. 8780

Part No. 6363

List or Part No.	Description		Use
P/6137	Rectangular Escutcheon, normally Chrome, or polished *Ni.*-plated, $1\frac{1}{16}$" × $1\frac{3}{4}$" Four $\frac{1}{8}$"Ø holes at $\frac{13}{16}$" × $1\frac{5}{8}$" crs.		All toggle switches, lever (dolly), rotary, key, with $\frac{15}{32}$"Ø bush
E.2/1	Flor. bronze Marked Off-On	'Bowl' Escutcheon, $1\frac{11}{16}$" Ø, two $\frac{1}{8}$"Ø holes at $1\frac{7}{16}$" crs. Depth, $\frac{7}{16}$". Panel hole, $1\frac{1}{4}$"Ø	*ditto.* Also very useful with thick panels
E.13/1	Nickelled Marked Off-On		
E.20	Flor. bronze Plain	ditto	ditto
E.21	Nickelled Plain		
P/1801	Standard knurled front ring-nut for switches. Normally *Ni.*-plated and normal to *front* of all lever (dolly) types		All have $\frac{13}{16}$" Ø 32 t.p." threads, and can be requested interchanged back-of-panel, front-of-panel for toggle switches, either *not* insulatedly-mounted, or when mounted with 2 × I.16 *Unless* asked for, switches are supplied as illustrated
P/4682	Closed bevelled and knurled front-only ring-nut. Normally *Ni.*-plated. Normal to key switches, panel front		
P/1800	Plain hexagon nut, normally *Ni.*-plated. Normally for *rear-of-panel* with all switches		
P/6308	Circular, smooth, slotted front-nut, normally *Ni.*-plated and normal to front of automobile switches		



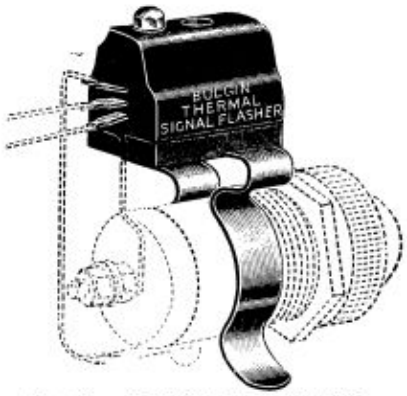
List Nos. E.20, E.21

Part No. 3794

LOW-VOLTAGE THERMAL-FLASHER SWITCHES

THESE special flasher-switches are intended to be used with signal-lamps, bells, buzzers and other warning or indicating devices, to increase the " urgency " of the signal concerned. Operating from the same supply as the signal itself (4, 6, or 12 V. ≃), the mean watts-rating is 1¼–1½ W. (or 2½–3 W., whilst heating and NIL whilst cooling). Adjustable, for typical full-cycle-times of 1–5 secs. approx. In moulded case, with hole to allow of screw-driver adjustment. Models may be parallel-connected to the source of current for the signal (voltage as the voltage-rating of the flasher), or connected in series (the current drawn by the signal to be as that required by the Flasher, and the source voltage to be equal to voltage of Flasher + voltage of Signal).

Measurements : approx. 0·875″ × 0·625″ × 0·687″ high, + fixing arrangements.



List Nos. S.582, 583, 584, 585, 587, 588

List Nos. S.580, 581, 586

Special List Nos. apply (on request) for strip-less or clip-less versions

Internal connections : three soldering-tags. TOP, contact-1 and heater 1. MIDDLE, contact-2. BOTTOM, heater-2.

(1) Parallel use: Supply to MIDDLE and BOTTOM, signal-device to TOP and BOTTOM.

(2) Series use: Supply *through Signal - device* (with shunt-Ω if needed) to MIDDLE and BOTTOM. No connections to TOP.

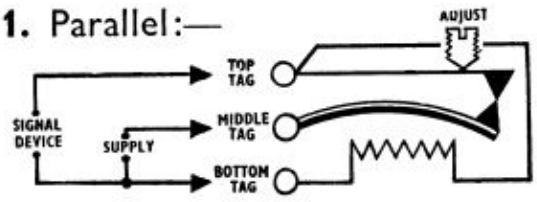
NOTE NEW (1953) RATINGS

List No.	Heater Ratings			Fixing
	Volts.	Amps.*	Watts	
S.580	4	0·63	2·5–3 Peak ; 1·25–1·5 Average (At 50–50% cycling)	Base Fixing Strip, —for 2 × 4 B.A. Holes @ 1⅛″ crs.
S.581	6	0·42		
S.586	12	0·25		
S.582	4	0·63		Steel (D.N.P.) Clip for cylindrical articles (e.g., signal-lamp barrels) of ⅞″–1⅛″Ø
S.583	6	0·42		
S.587	12	0·25		
S.584	4	0·63		ditto Clip for ⅝″–⅞″Ø
S.585	6	0·42		
S.588	12	0·25		

* Approx. ± 15%

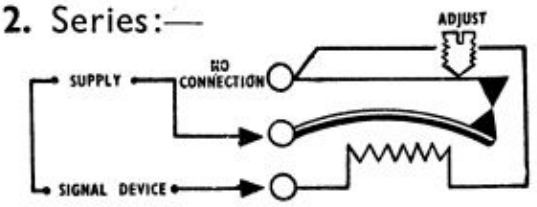
FLASHER-CIRCUITS

1. Parallel:—



Simplest connections, when supply is 4, 6, or 12 V. Current rating of signal-device may then be 1 A (= max rating for the contacts)

2. Series:—



Connections for 12 V.; use lamp or signal rated @ 6 V., with 6 V. Flasher, and so on ; *always* of same current-ratings. Or similarly for supplies of 16–36 V. (max. circuit voltage).

AMBIENT-TEMPERATURE-OPERATED AUTOMATIC THERMAL CUT-OUTS

(OPEN TYPE ; RESETTABLE)

THESE new automatic circuit-interrupters are suitable for all classes of equipment in which an excess temperature rise (for example, due to stopped ventilation) might cause part- or whole-combustion. They are *NOT* operated by rise of current, but by other heating therefrom. Obvious uses are Radio Sets, Office appliances, Blower-heaters, Drying cabinets, Electronic equipment, etc. The user sites the device according to heat source, danger points, vulnerability, etc. Principally operated by ambient temperatures, rather than by current magnitude. For normal use at up to 1·5 A. Will rupture 5 A. (250 V. max., ~ ratings), at which slight self-heating will promote severance. The spring-blades are inter-engaged by a temperature-sensitive lock-billet, and are easily re-engaged by re-setting with a new billet (no more costly than a fuse!) For longest life, normal max. working temperature should not exceed 66⅔% of rated rupturing temperature.

List Nos. F.S. 11–13

List No. of Complete Item	List No. Replacement Billet	Colour Code	Operating Temperature
F.S.11	**F.S.11/B**	RED	160° ± 10% F.
F.S.12	**F.S.12/B**	YELLOW	200° ± 10% F.
F.S.13	**F.S.13/B**	GREEN	280° ± 10% F.
Normal use at up to 1·5 A. circuit-current, 250 V. max. Will rupture 5 A. peak or overload current. *All* ratings at 50 ~.			

AMBIENT-TEMPERATURE-OPERATED AUTOMATIC THERMAL CUT-OUTS

(ENCLOSED TYPE ; EXPENDABLE)

This alternative enclosed type is designed for the same work as F.11–13 above, but is expendable. Principally operated by ambient temperatures, rather than by current magnitude. For normal use at up to 1·5 A. Will rupture 5 A. (250 V. max., ~ ratings), at which slight self-heating will promote severance. This fully enclosed Cartridge-Model fits to a special clip-holder which can be supplied on request, if wanted. It can be cell-housed in a transformer-winding or -structure, or otherwise sited into a vulnerable point. It is not resettable. For longest life, normal max. working temperature should not exceed 50% of rated rupturing temperature.

List Nos. F.S.1–3

The technique of apparatus-protection by "temperature-sensing" is new, but well to the point ! Once again, the HOUSE OF BULGIN pioneers with a device which ensures safety from fire, whether due to a current-rise, or not, operating solely by detection of a dangerously-high heat.

List No. of Complete Item	Colour Code	Operating Temperature
F.S.1	RED	160° (± 10%) F.
F.S.2	YELLOW	200° (± 10%) F
F.S.3	GREEN	280° (± 10%) F.
Normal use at up to 1·5 A. circuit-current, 250 V. max. Will rupture 5 A. peak or overload current. *All* ratings at 50 ~.		

List No. F.257

CLIP-HOLDER FOR F.S. 1–3

ROBUST holder for all 39 mm. × 10 mm. ⌀ fuses, such as F.S.1–3 above, and F.240 etc. on page 10. S.R.B.F. base and highly-plated metal parts. Overall dimensions:—Height = $\frac{23}{32}$″, Length = $2\frac{3}{16}$″, Width = 1″. Designed for 250 V. max., circuits, 500 V. max. to E. I.R. = 40 M Ω at 1 KV. = max. **List No. F.257.**

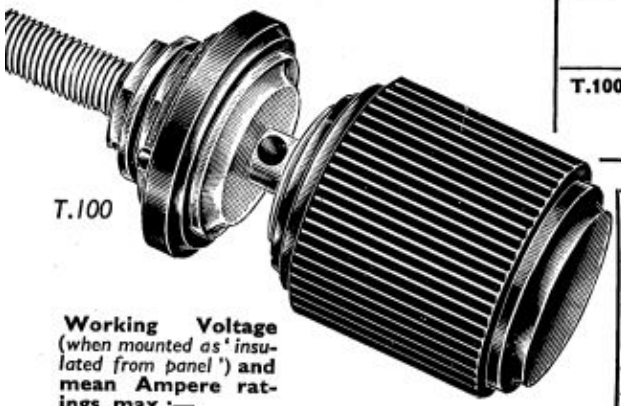
A USEFUL RANGE of Terminals in a group of identical appearances with graded size. All fitted with turned-brass accurately threaded brass inserts, Nickel-plated ; British-Standard threads. The mouldings are highly glossy, thermo-plastic styron, with highest insulating properties. All are complete with matching moulded base-collar (also fitted with brass-insert, collar-plate) which bushes to panel ; a rear-of-panel insulating washer is included, and 2-ea. metal-washers and nuts. Note the cross-hole in stem with the exception of List No. T.103 which has plain undrilled stem.

STATE COLOUR ON ORDERS

T.103

T.102

T.101



T.100

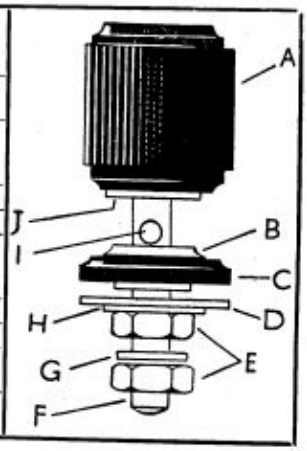
List No.	Normally plain (but can be had with Legends to Quantity Orders). Please state colour when ordering	Overall or Max. Dimensions Ø	Height off Panel*	Length	Thread
T.103	Choice of 6 brilliant colours. Black, Red, White Blue, Green, Yellow	5/16"	5/8"	1 1/4"	4 B.A.

List No.	Normally plain (but can be had with Legends to Quantity Orders). Please state colour when ordering	Overall or Max. Dimensions Ø	Height off Panel*	Length	Thread
T.102	Choice of 6 brilliant colours. Black, Red, White, Blue, Green, Yellow	21/32"	1 1/32"	1 7/8"	2 B.A.

List No.	Normally plain (but can be had with Legends to Quantity Orders). Please state colour when ordering	Overall or Max. Dimensions Ø	Height off Panel*	Length	Thread
T.101	Choice of 6 brilliant colours. Black, Red, White, Blue, Green, Yellow	1 1/32"	1 7/16"	2 3/8"	1/4" UNIFIED THREAD

List No.	Normally plain (but can be had with Legends to Quantity Orders). Please state colour when ordering	Overall or Max. Dimensions Ø	Height off Panel*	Length	Thread
T.100	Choice of 6 brilliant colours. Black, Red, White, Blue, Green, Yellow	1 1/2"	1 3/8"	2 7/8"	5/16" UNIFIED THREAD

A	Moulded Terminal Head, Choice of 6 colours
B	Mounting-bush insert
C	Moulded Mounting-Bush, Choice of 6 colours
D	Insulating washer
E	Fixing-Nuts
F	Stem, threaded as shown in tables above
G	Metal-washer
H	Metal-washer
I	Hole drilled in stem, except T.103
J	Threaded brass insert



Working Voltage (*when mounted as 'insulated from panel'*) **and mean Ampere ratings, max.:—**

T.103: 7·5 A., 0·50 KV. **T.102:** 15 A., 0·75 KV.
T.101: 30 A., 1·0 KV. **T.100:** 60 A., 1·5 KV.

N.B.—The max. Peak-wkg.-V. figures should be approached with discretion by users, where persons can have access to live terminals.

* Fully tightened, without gripping wire(s).

PANEL HOLES : When fixed 'live' to panel discard rear ins.-washer. For 'dead' fixing, panel holes = **T.100**, 5/8"Ø ; **T.101**, 1/2"Ø ; **T.102**, 3/8"Ø ; **T.103**, 1/4"Ø ; (*all* + 1/64",–0.) Plus 'key'-hole for keying the base to panel.

(All illustrations are approximately ¾–⅞ size)

THESE Moulded-Bakelite Terminals and Terminal-Heads (and accessories) cover a range of British-Standard 6 B.A., 4 B.A., and 0 B.A. threads, and provide a useful group for all kinds of apparatus where various items and sizes, not necessarily matching in every appearance, are wanted. All are highly polished, and afford excellent wire-clamping. T.L.1–4 have ' castle ' -base (avoiding strand-straying) and Captive-head (but removable by intentional pull). *All* have solid turned-brass Inserts in the heads.

List Nos. T.1, 2

List Nos. T.27, 28, 64, 65

List Nos. T.L.1.–4

List No. T.L.5

List No.*	Normally plain but can be had with Legends to Quantity Orders. Please state Red or Black when ordering	Overall or Max. Dimensions			Thread
		Ø	Height off Panel	Length	
T.1	Red	1/2"	3/4"	9/16"	4 B.A.
T.2	Black				
T.L.1	Red	5/16"	7/16"	1 9/16"	
T.L.2	Black				
T.L.3	Black :—" Aerial "				
T.L.4	Black :—" Earth "				
T.27	Red	5/16"	3/4"	9/16"	
T.28	Black				
T.64	Black :—" Aerial "				
T.65	Black :—" Earth "				
T.L.5†	Black, *or* Red *to order*	7/8"	7/8"	1 1/2"	1/4" UNIFIED THREAD

* As supplied, like to panel, all models to T.65 ; but see below for accessories.
† As supplied, insulated to panel.

List Nos. T.5–8

List No. T.L.K.

Part No. 5238

Part No. 834

Part No. 4692

TERMINAL HEADS only :—Full List below

PANEL-WASHERS :—Made of best grade S.R.B.P. (or -F. to order). One each of 4692, and 834 or 5238 (or two of 4692) provide complete panel-isolation for up to 250 V. wkg.

ACCESSORIES FOR TERMINALS ; TERMINAL PARTS

List No.	Description	Dimensions		Thread
		Ø	Height or thickness	
T.5/Black	Terminal-head only brass-inserted, Small type	1/2"	3/8"	4 B.A.
T.6/Black		1/2"	3/8"	6 B.A.
T.7/Red		1/2"	3/8"	4 B.A.
T.8/Red				6 B.A.
TLK/Black TLK/Red	ditto, Medium type	5/16"	3/16"	4 B.A.

List No.	Description	Dimensions		Thread
		Ø	Height or thickness	
Pt. No. 5238	Plain Washers	5/8"	1/16"	*Central* 4 B.A. *clearing hole*
Pt. No. 834		1/2"	1 mm.	
Pt. No. 4692	Embossed Washer	1/2"	1/16"	Panel-hole, 1/2"Ø ; *central hole,* 4 B.A. *clear*

SUPPRESSORS
AND
TRIMMING TOOLS & CO-AXIAL PLUGS AND SOCKETS

List No. P.445 *List No. P.444*

IGNITION INTERFERENCE SUPPRESSORS

THESE Plastic encased unbreakable Suppressors are for the alleviation and cure of interference with Television, Car-radio, etc., from motor cars, lorries, vans, etc. They fit to the *Distributor*, re-taking the lead from the coil ; no tools needed, fitted in under a minute, no adverse effect whatsoever upon engine performance. Water-proof, moulded in flexible plastic. Two models, for plug-in (e.g., " Ford ") or screw-in (e.g., " Lucas ") systems.

List No. P.444, plug-in.
List No. P.445, screw-in.

List No. T.T.1

TRIMMING TOOLS

FOR the accurate trimming and padder-adjustment of modern sensitive receivers and apparatus, the ordinary screwdriver may cause trouble due to capacitance to earth, etc. These trimming tools are specially designed for the purpose, and use of them greatly facilitates all adjustments.

List No. T.T.1. Small steel-bladed with 6" black handle.
List No. T.T.3. Double-ended, of non-metallic hard-fibre. (Not illustrated).

List No. P.270 left *List No. P.280 right*

P.270 + 280 shown engaged

CAR-RADIO, etc., CO-AXIAL CONNECTORS

THESE useful connectors conform to U.S.A. standards for these types of car-radio connectors, and engage surely and reliably. With screened cable, the screen, or co-axial-outer, is soldered to the outer metal tube, and the inner conductor to the central contact. The springs do not carry current. Vibration-proof. Non-ferrous, finished heavily SILVER-plated, for ease of soldering and for permanently low-Ω connections. Max. V., 50; max. A., 15.

Ideal for T/V. Aerial connections, and for a host of uses, including Microphone and Pick-up connections.

List No. P.270 left *List No. P.290 right*

P.270 + 290 shown engaged

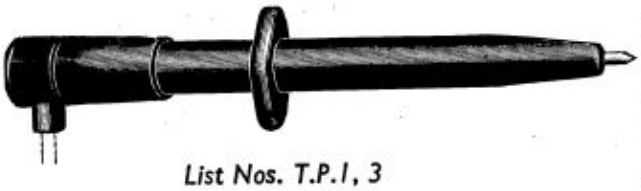
List No. P.270, Flex-attaching PLUG used with *all* Sockets.
List No. P.280, Flex-attaching SOCKET.
List No. P.290, Chassis-fixing SOCKET.

(List No. P.290, fix by 2 × 6 B.A., at $\frac{23}{32}$" crs., with $\frac{1}{2}$" ⌀ body-hole.)

For *Fuse-holding* Sockets, see pp. 14, 15.

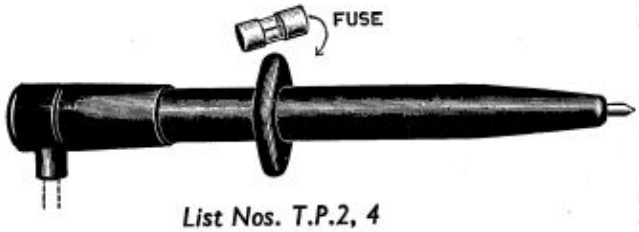
NEW MOULDED TEST-PRODS

THE handiest of items for experimenters, service-men, laboratory-workers, etc. Fully insulated, 6" long, with glossy coloured body, in 'Styron' moulding material, and fitted with polythene flexible terminal-cover and cable-strain-relief CAP. Fitted with fine-point contact, heavily NICKEL-plated. Leads fit to 6 B.A. grub screw termination. Models with Fuse normally supplied 1 A., but all sizes of $\frac{5}{8}$" × $\frac{1}{4}$"Ø fuses (p. 11) may be used. Specify fuse-rating when ordering, or 1 A. size will be fitted. These have self-retracting points, and T.P.12, 14 have 'crochet-hook' slot near tip, to grip wires ⩾ 18 S.W.G. For ⩾ 500 V. use, 250 V. normal maximum.



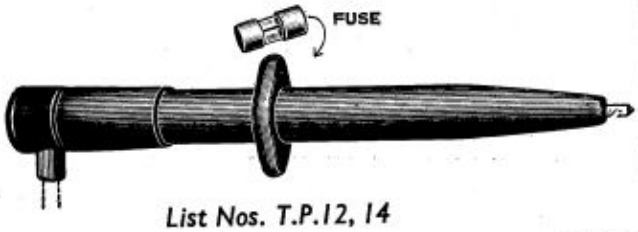
List Nos. T.P.1, 3

List No.	Colour
T.P.1	BLACK
T.P.3	RED
Description	Plain Test-prods, non-retracting points, without fuses



List Nos. T.P.2, 4

List No.	Colour
T.P.2	BLACK
T.P.4	RED
Description	Retracting-point Test-prods, with internal fuse (replaceable). 1 A. Fuse is supplied unless otherwise requested. Full range of Fuses ($\frac{1}{4}$"Ø × $\frac{5}{8}$") see p. 11 (3 A. max.)



List Nos. T.P.12, 14

List No.	Colour
T.P.12	BLACK
T.P.14	RED
Description	*Ditto*, with slotted prod, to self-grip wires ⩾ 18 S.W.G.
Further models in course of preparation.	

NEW TWIST-GRIP TEST-PROD

CLIP, TWIST and it GRIPS!

SLENDER-HANDLE Test-prod with the unique 'Twist Grip' wire ends. Prods or clips on to stiff wires, etc., of 0.020–0.0625"Ø. Ideal for use in inaccessible places. Easy cable connection, unplugs.

LIST NOS.
T.P.16 (RED)
T.P.17 (BLACK)

List No.	Colour
T.P.16	RED
T.P.17	BLACK
Description	Slender handle with twist grip wire ends. Overall length 6$\frac{5}{32}$". Fully insulated Coded RED or BLACK

NEON TEST-PROD

List No. T.P.9

THIS new and useful tester replaces the former model T.P.5, and incorporates removable lamp, for replacement if need ever arises. Suitable for testing up to 250 V. supplies, ≅. Will indicate polarity and detect leakage (Cathode glows on D.C.). Both lamp-electrodes glow on A.C. Housed in moulded rubber black case with sleeved semi-flexible semi-stiff leads. Totally shock proof and safe. Tapped across fuses will show if blown, if short still exists, and so on. The gadget of 1,000 uses. Internal lamp-holder and safety resistor fully enclosed in plastic moulded core, waterproof. Lamp ("Osram" 'G'-type Neon or like size) renewable.

To detect live terminal or wire, connect one prod-point to E., and the other to each mains-lead in turn; live will show 'glow.'

To show insulation leak, connect between frame of appliance and earth; *bright* glow demonstrates leakage. Capacitors similar tests. Insulation value may be assessed by checking degree of glow with known resistors, on same supply voltage, of 1 M Ω, 2 M Ω, and so on.

List No. T.17

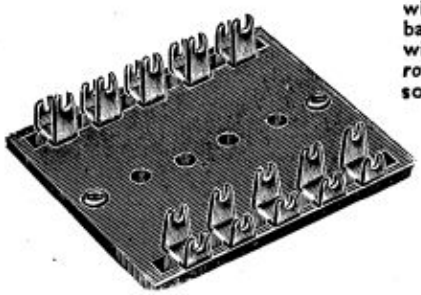
List No. T.19

List No. T.21

List No. T.23

List No. T.25

List No. T.35



List No. C.109

GROUP-BOARDS

MOUNTING STRIPS

SILVER PLATED tags and bracket fittings spaced $\frac{3}{8}$" on $\frac{3}{8}$" wide bakelite strips for 250 or 500 V. working. As illustrated.

Double-end tags noted as "d.e."

Live Tags	Fixing Tags	List No.
1 d.e.	1	T.32
2	1 d.e.	T.17
2 d.e.	1	T.18
2 d.e.	1 d.e.	T.19
4	1 d.e.	T.20
3	2 d.e.	T.21
3 d.e.	2 d.e.	T.22
6	1 d.e.	T.23
5	2 d.e.	T.24
5 d.e.	2 d.e.	T.25

TAG-STRIPS

FITTED easy-soldering double-end tags at $\frac{3}{8}$" spacing on $\frac{3}{8}$" wide bakelite strip as illustrated. Useful and low-priced. $\frac{1}{8}$"Ø fixing holes.

Fixing Centres	No. of Tags	List No.
$1\frac{1}{8}$"	2	T.37
$1\frac{1}{2}$"	3	T.38
$1\frac{7}{8}$"	4	T.39
$2\frac{1}{4}$"	5	T.40

SCREW CONNECTOR STRIPS

USEFUL flex-wire or cable connectors, fitted 4 B.A. screws. Spacing $\frac{1}{2}$", $\frac{1}{16}$"Ø fixing holes. Best bakelite insulation. Plated metal parts.

Fixing Centres	No. of Poles	List No.
$1\frac{1}{2}$"	2	T.33
2"	3	T.34
3"	5	T.35
4"	7	T.36

CAPTIVE-SCREW STRIPS

FITTED with rear soldering tags, and captive large-head slotted screws at $\frac{5}{16}$" spacing. Form inexpensive terminal plates, etc.

Fixing Centres	No. of Poles	List No.
$1\frac{3}{4}$"	2	T.45
$2\frac{1}{16}$"	3	T.46
$2\frac{3}{8}$"	4	T.47
$3\frac{3}{16}$"	6	T.48
$4\frac{1}{16}$"	8	T.49
$5\frac{3}{16}$"	10	T.50

GROUP-BOARDS

USEFUL for grouping resistors, capacitors, etc., as well as anchoring wire-junctions. Insulation of finest-grade bakelite-type laminated board. Models with tags use new 'clinched-on' *non-rotatable* silver-plated double-ended solder-tags.

Type	Ways	List No.
Tags	1	C.105
Tags	2	C.106
Tags	3	C.107
Tags	4	C.108
Tags	5	C.109
Tags	10	C.114
Holes	6	C.34
Holes	12	C.35
Holes	24	C.36

List No. T.32

List No. T.20

List No. T.22

List No. T.24

List No. T.40

List No. T.48

List No. C.35

Versions in special materials/finishes (e.g., ' Tropical ' or Specificational) may be manufactured to special quantity orders.

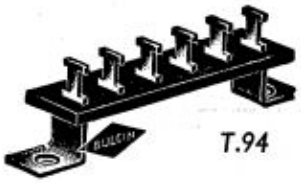
NEW BULGIN TAG-STRIPS AND GROUP BOARDS FITTED WITH RIGID COPPER SOLDER-TAGS

THESE new Tag-Strips and Group Boards are made in highest-grade commercial quality bakelite type board, or in R.C.S. 1000 grade-II elec. S.R.B.F. phenolic sheet and are fitted with heavily-tinned brass rigid solder-tags, riveted into position with ample turn-over or swage. They are thus suitable for all exacting uses and the highest-grade equipments and instruments, with high factor of climatic-withstanding ability. Fixing legs are all with integral solder-tag for earthing purposes when jointing, grouping, etc., and have ·150″ ⌀ clearance holes.

These components are thus also easily made **'TROPICAL'**, for which prefix the List Nos. " T/— " to obtain that quality.

T.73

T.80

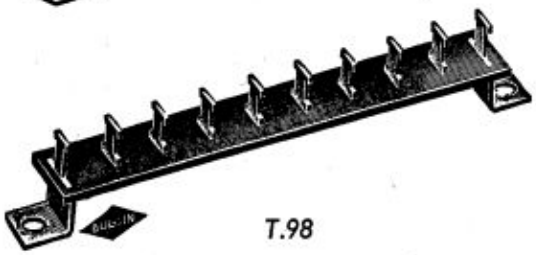


T.94

SINGLE-LEG TAG-STRIPS

SINGLE-LEG tag-strips for securing and connecting all kinds of wire-end components, and wires. Each has *one* " earthing tag " (integral with the fixing leg) and the No. of " live "-tags listed below. Fixing hole, 0·150″⌀.

List No.	No. of Live Tags	O.A. Size, ″ ; height last	Type ; Vertical or Horizontal
T.73	2	$\frac{7}{16}$″ × 1$\frac{1}{32}$″ × $\frac{3}{4}$″	Vertical
T.80	2	$\frac{31}{64}$″ × 1$\frac{1}{8}$″ × $\frac{3}{4}$″	Horizontal

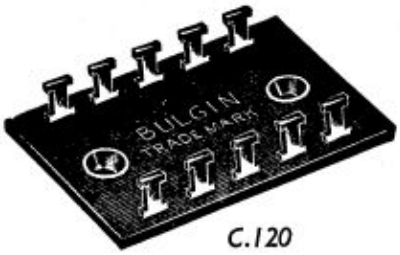


T.98

DOUBLE-LEG TAG-STRIPS

TWO-LEG tag-strips for securing and connecting all kinds of wire-end components, and wires. Each has two " earthing-tags " (integral with fixing legs) and the No. of " live "-tags listed below. Fixing holes = ·150″⌀.

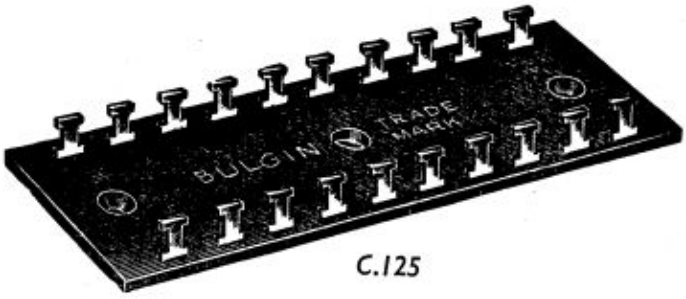
List No.	No. of Live Tags	O.A. size, ″ ; height last	Fixing crs., ″
T.94	4	$\frac{7}{16}$″ × $\frac{13}{64}$″ × $\frac{21}{32}$″	2 holes ·150″⌀ 1·972″ between crs.
T.98	8	$\frac{7}{16}$″ × 3$\frac{1}{2}$″ × $\frac{21}{32}$″	2 holes ·150″⌀ 3·249″ between crs.



C.120

GROUP BOARDS

GROUP-BOARDS for resistors, capacitors, r.f.-inductors, etc., provided with five or ten pairs of tags, and brass 6. B.A. threaded fixing bosses.



C.125

List No.	No. of ways (pairs of tags)	O.A. size, ″	Fixing crs., ″
C.120	5	1$\frac{1}{4}$″ × 1$\frac{13}{32}$″ × $\frac{13}{32}$″ approx.	2 holes tapped 6 B.A. 1·156″ between crs.
C.125	10	1$\frac{1}{4}$″ × 3$\frac{3}{16}$″ × $\frac{13}{32}$″ approx.	2 holes tapped 6 B.A. 2·75″ between crs.

MULTIPLE STRIPS FOR INTERCHASSIS AND RACK CONNECTION

MANUFACTURED from the finest-grade Bakelite Sheet, with rolled butt-jointed hollow pins for tip-soldering, and fully floating self-aligning sockets with integral solder-tags. Both Pins and Sockets are Electrolytically tinned for reliable soldering. They are designed for use in electronic equipment requiring multiple connections, and are available in 3, 4, 5, 6, 8, 10 and 12 way models.

ELECTRICAL RATING. Insulation between adjacent poles, or to fixing screw (6 B.A.), withstands 2,000 V. A.C. 50 cycles test. Maximum recommended working voltage pole to pole and poles to fixing screw is 500 V. D.C., 350 V. R.M.S. A.C. Contact resistance-measured with low-voltage D.C., at 5 Amperes, is less than 0·002 Ohm and the maximum continuous carrying rating of 5 Amperes (A.C. and D.C.) per pole is conservatively fixed.

THREE-WAY

List No.	Fixing Dimensions
T.106 (Plug)	2 × 0·130″Ø holes at 1⅛″ centres
T.107 (Socket)	Ditto

FOUR-WAY

List No.	Fixing Dimensions
T.108 (Plug)	2 × 0·130″Ø holes at 2 5/16″ centres
T.109 (Socket)	Ditto

FIVE-WAY

List No.	Fixing Dimensions
T.112 (Plug)	2 × 0·130″Ø holes at 2⅜″ centres
T.113 (Socket)	Ditto

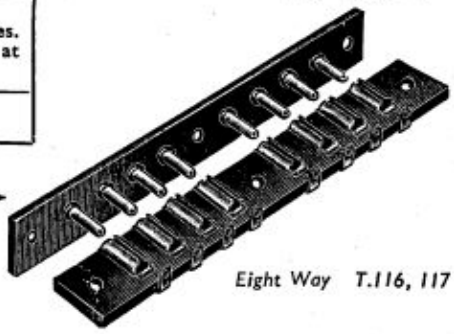
SIX-WAY

List No.	Fixing Dimensions
T.118 (Plug)	3 × 0·130″Ø holes, each at 1¼″ centres. 2 outside holes at 3½″ centres
T.119 (Socket)	Ditto

Six Way T.118, 119

EIGHT-WAY

List No.	Fixing Dimensions
T.116 (Plug)	3 × 0·130″Ø holes, each at 2 5/16″ centres. 2 outside holes at 4⅝″ centres
T.117 (Socket)	Ditto

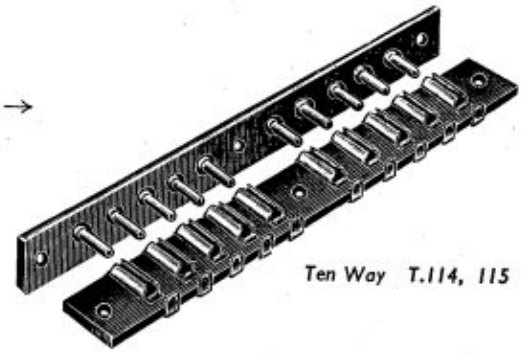


Eight Way T.116, 117

Three Way T.106, 107

TEN-WAY

List No.	Fixing Dimensions
T.114 (Plug)	3 × 0·130″Ø holes, each at 2⅜″ centres. 2 outside holes at 5¼″ centres
T.115 (Socket)	Ditto

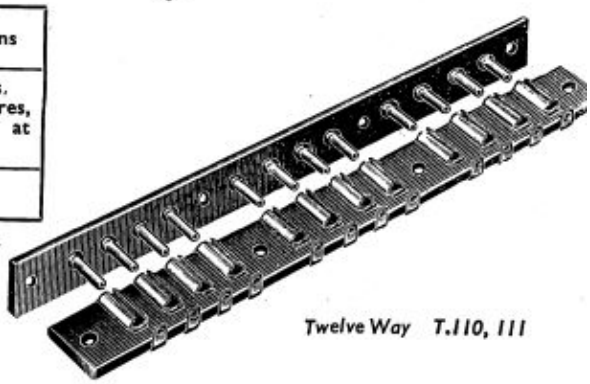


Ten Way T.114, 115

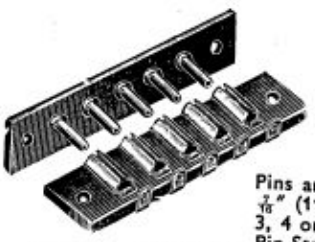
Four Way T.108, 109

TWELVE-WAY

List No.	Fixing Dimensions
T.110 (Plug)	4 × 0·130″Ø holes, each at 2 5/16″ centres, 2 outside holes at 6 5/16″ centres
T.111 (Socket)	Ditto



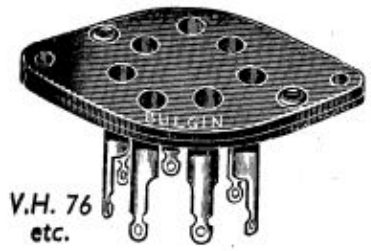
Twelve Way T.110, 111



Five Way T.112, 113

Pins and Sockets equally spaced at 7/16″ (11·1 mm.) centres, in sets of 3, 4 or 5 as shown in illustrations. Pin-Strip = 3/32″ Bakelite. Socket-Strip = 1/16″ Bakelite. (*Standard Commercial Quality.*)

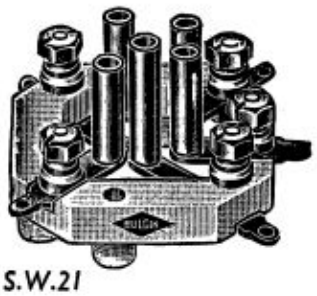
BASEBOARD AND CHASSIS VALVEHOLDERS AND VALVEHOLDER ADAPTOR



V.H. 76 etc.

V.H. 85

A 52



S.W.21

V.H.19

S.W.41

THIS range of holders, fills practically every requirement. Insulation, of laminated bakelite-type board, moulded, or ceramic, is of highest possible quality. Contacts are heavily silver-plated, and soldering-tags are integral. Where fitted, terminals are nickel-plated. All types are accurate to British standards for valve bases and holders.

List No.	No. of Pins	Pin Spacing	Insulation and Notes	Fixing Details: Hole Ø	Fixing Details: At centres
V.H.76	4	British	Lam. Bakelite general purpose	·096″	1 13/16″
V.H.77	5	British		·096″	1 13/16″
V.H.78	7	British		·096″	1 13/16″

List No.	No. of Pins	Pin Spacing	Insulation, and Notes	Fixing Details: Hole Ø	Fixing Details: At centres
V.H.85	8	Int. Octal		·125″	1 1/8″

List No.	No. of Pins	Pin Spacing	Insuln.	Fixing Details: Hole Ø	Fixing Details: At centres
A.52	8	Int. Octal	Moulded. All-split wireable ADAPTOR	—	—

List No.	No of Poles, etc.: Poles	No of Poles, etc.: Spacing	Insulation	Special Notes	Fixing holes: Ø	Fixing holes: Centres
S.W.21	5	British	Ceramic	Tropical, low-loss	·150″	1 11/32″†

List No.	No. of Poles, etc.: Poles	No. of Poles, etc.: Spacing	Insulation	Special Notes	Fixing holes: Ø	Fixing holes: Centres
V.H.19	5	British	Moulded	General Purpose	·150*	1 7/16″

List No.	No. of Poles, etc.: Poles	No. of Poles, etc.: Spacing	Insulation	Special Notes	Fixing holes: Ø	Fixing holes: Centres
S.W.41	5	British	Ceramic	Tropical and low-loss	·120″	1 3/8″†

List No.	No. of Poles, etc.: Poles	No. of Poles, etc.: Spacing	Insulation	Special Notes	Fixing holes: Ø	Fixing holes: Centres
V.H.80	12	1 3/8″ p.c.Ø with spigot, for 1/8″ Ø pins	Laminated bakelite-type	General Purpose	·150* (four)	2 1/8″ × 2 1/8″

Note: V.H.80 is not illustrated on this page, but is shown with its mating plug on page 44.

Dimensions of ceramics may vary by up to ± 1/32″. Chassis-holes, if punched, preferably should be SLOTS.

VALVE-TOP CONNECTORS

'STANDARD' AND 'OCTAL' SIZES

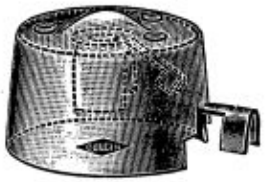
THESE top-boss connectors for valves cover both simple and screened types, for 'Standard' (0·360″ ⌀ nominal) and 'Octal' (¼″ ⌀ nominal) boss receiving valves, rectifiers, etc. No other organisation can offer such a comprehensive range, and meet all needs. Contacting members are sprung, and heavily SILVER-plated.

List No. P.41

List No. P.66

List No. P.470 *List No. P.471*

List No. P.497, 498



List No. P.64B etc.

List Nos. P.65/S etc.

List No.	Description
P.41	For Standard boss ; general purpose type

List No.	Description
P.66	For Standard boss ; with 5 B.A. terminal

List No.	Description
P.470	Standard, Anti-corona valve-top boss connector
P.471	Octal, Anti-corona valve-top boss connector

List No.	Description
P.497	P.V.C. Moulded, Anti-corona type, with large brim against leakage by dust, and with side-cable-entry. For 'Standard' boss 0·360″⌀ normal. Max. wkg. temperature = 60°C., by heating from all/any sources.
P.498	Ditto, for Octal boss

List No.	Description
P.64B	For Standard boss ; 1 5/16″⌀, 13/16″ h.
P.65B†	For Standard boss ; 1 5/16″⌀ ⅝″ h.
P.118†	For Standard boss ; 1 5/16″⌀ ⅝″ h.*
P.103B†	For Octal boss ; 1 5/16″⌀ ⅝″ h.
P.109†	For Octal boss ; 1 5/16″⌀, ⅝″ h.*

List No.	Description
P.65/S	As List No. P.65B, but with Side Springs.
P.65/S/R	Ditto, with extra Resistor tag inside screen. For Standard boss
P.103/S	With Springs to clip to chassis base-lugs, gives automatic valve-retention, also earthing of screen of connector. Otherwise as P.103B above.
P.103/S/R	As List No. P.103/S, but with extra tag for resistor, inside screen. For Octal boss

* Without clip for braiding at side (*Anchor by soldering*).

† May be had with extra double-ended internal tag for series-resistor securing. Add "—/**R**" to List No.

We can supply, to quantity order, tropical-versions (prefix :—"**T**/—" to List No.) or versions to Special Specifications—e.g., R.C.S.1000 when the List No. takes suffix :— "—/**RCS1000.**"

ALSO :—**P.472** (as P.470 without internal clip), with 6 B.A. clear 0·125″⌀ hole ; **P.473** ditto, 4 B.A. clear, 0·156″⌀ hole ; for use with terminals, studs, etc., for 'anti-corona' performance.

'STANDARD' AND 'OCTAL' SIZES (*continued from page 138*)

List No. P.96 *List Nos. P.43 etc.*

List No.	Description
P.96	For Octal boss $\frac{1}{4}$" Ø nom. ; general purpose type

List No.	Description
P.43	Black bakelite shroud } for Standard boss (0·360" Ø nom.); $\frac{5}{8}$"Ø × $\frac{9}{16}$" high
P.87	Red bakelite shroud }

List No. P.440

List No.	Description
P.440	Red bakelite shroud. For Standard boss ; $\frac{3}{4}$" Ø × $\frac{15}{32}$" high
P.441	Red for Octal boss ; $\frac{3}{4}$"Ø × $\frac{15}{32}$" high

List No. P.441

List No.	Description
P.495	Black **polythene** enshrouded Valve-top connector (in RED to special quantity order) for Standard boss Max. wkg. temperature = 60°C., by heating from all/any sources.
P.496	Ditto, for Octal boss

List Nos. P.495, 496

List No.	Description
P.164B	For Standard boss ; 1"Ø, $\frac{3}{4}$" h. Screened†
P.165B	For Standard boss ; 1"Ø, $\frac{15}{32}$" h. Screened†
P.181B	For Octal boss ; 1"Ø, $\frac{15}{32}$" h.†

List Nos. P.164B etc.

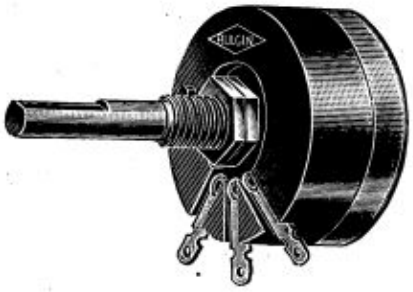
List No.	Description
P.92	Red bakelite shroud. For Standard boss ; 1$\frac{5}{8}$" Ø, 1" h.
P.92/R	Has isolated d/e tag inside, for junction to series resistor
P.322	Red for Octal boss ; 1$\frac{5}{8}$" Ø × 1$\frac{1}{32}$" high
P.322/R	Has isolated d/e tag inside, for junction to series resistor

List No. P.92 etc.

†Cover clips on *after* wiring.

We can supply, to quantity order, tropical-versions (prefix "**T/—**" to List No.) or versions to Special Specifications—e.g., R.C.S.1000 when the List No. takes suffix "**—/R.C.S.1000.**"

3-WATT WIRE-WOUND LINEAR-LAW POTENTIOMETERS FOR VOLUME, TONE-CONTROL, etc.



List Nos. I.V.C.1–24

THESE linear-law Potentiometers have ± 15% conformity with linearity, and ≯ 2½% 'end-hop' or residual-Ω. Wound with specially selected resistance-wire, rated for 3-W. max., continuous, at ambient 70° C., the specified mA. applies to any part of the element. Silent squash-plate action, efficient performance with minimum element wear. For all circuits not exceeding 3 Watts.

With standard R.G.M.F. ¼″ ⌀ shafts (0·247″–0·249″ ⌀ actual) to accept standard knobs (see pp. 17–25). Free length of shaft from bush-face, 1⅛″ ± 1/16″. With fixing nut ⅜″ ⌀, 26 t.p.i., for panels up to 7/32″ thick. Case ⌀, 1⅛″ : ¾″ deep projection from rear of panel. Metal parts highly plated finish : best quality moulded bakelite-type case. Tested at 500 V. to shaft and metal lid for insulation resistance of ≮ 40M Ω. Ω-tolerance, ± 20%.

Solder-tags heavily SILVER-plated for ease of connection.

Ω	Max. mA.	LIST Nos. With Tags
10	550	I.V.C.1
15	450	I.V.C.2
22	370	I.V.C.3
33	300	I.V.C.4
47	250	I.V.C.5
68	210	I.V.C.6
100	173	I.V.C.7
150	140	I.V.C.8
220	116	I.V.C.9
330	95	I.V.C.10
470	80	I.V.C.11
680	67	I.V.C.12

Ω	Max. mA.	LIST Nos. With Tags
1·0 K.	55	I.V.C.13
1·5 K.	45	I.V.C.14
2·2 K.	37	I.V.C.15
3·3 K.	30	I.V.C.16
4·7 K.	25	I.V.C.17
6·8 K.	21	I.V.C.18
10·0 K.	17·3	I.V.C.19
15·0 K.	14·0	I.V.C.20
22·0 K.	11·6	I.V.C.21
33·0 K.	9·5	I.V.C.22
47·0 K.	8·0	I.V.C.23
68·0 K.	6·7	I.V.C.24

* For quantity orders all types can be supplied with 'live' bush if required.

WALL JACKS

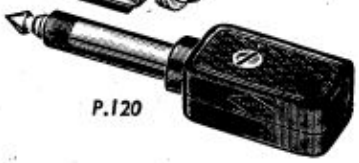
List Nos. W.J.13, 14

THE reliable two-pole jacks and jack-plugs developed from Post Office telephone types and made to the Industry-standard, B.S.666, are particularly suitable for connecting speech and music-circuits, and have many advantages. These MOULDED wall-jacks are suitable for surface mounting, and provide a safe, all-insulated method of non-reversible (i.e., polarised) connection. Fitted with terminals beneath screw-on cover, for wiring connections. For domestic uses and particularly suitable for hospitals, institutions, etc. Comply with essential dimensions of B.S.666. Highly polished and of thermo-setting bakelite. 50 V. max. (1 A.) and 0·1 V. (5 A.) min. Plugs are shown on p. 27.

For Jack-Plugs see Page 30

List No. W.J.13	...	BLACK
List No. W.J.14	...	BROWN

P.121



P.120

SPECIAL PLUGS AND JACKS FOR CHARGERS, ETC.

(NOTE.—These are not suitable for loud-speaker, microphone, or wall-jack connecting.)

SIMILAR to normal co-axial Jacks and Plugs, but intended for non-reversibly connecting trickle-charger to car-battery (plug 'live'; jack on dashboard, etc., wired to battery). Plug cannot 'short' itself on to any flat conducting surface. Plug has 6 B.A. terminals ; jack has solder-tags. Max. ratings : 24 V., 3 A.

List No. P.120 PLUG (*Black*) **List No. P.121**, JACK

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