E.S.M.

European Switches Manufacturing

R E E D
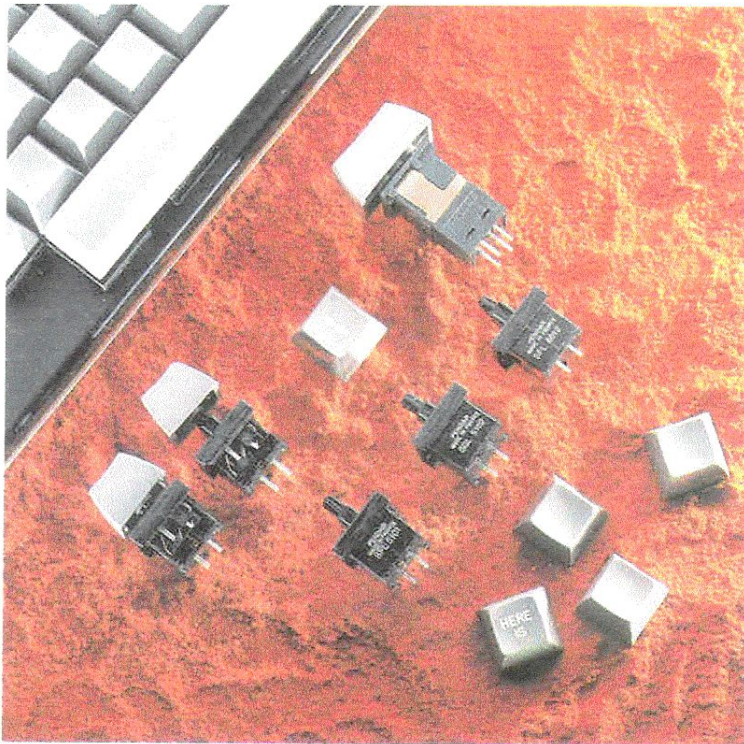
K E Y S W I T C H E S

SPECIFICATIONS

CONTACT ARRANGEMENT
1 form A: SF, SG/SK, SI/SH
2 form A: SF

SWITCHED POWER
5 VA resistive maximum

VOLTAGE
100 Vdc maximum

CURRENT
300 mA maximum

INITIAL CONTACT RESISTANCE
< 250 milliohms

DIELECTRIC STANDOFF (capsule)
200 Vdc - 150 Vrms

CONTACT BOUNCE
500 μS maximum

LIFE EXPECTANCY (operations)
> 50 x 10^6: SF, SI/SH
> 5 x 10^6: SG/SK

OPERATING TEMPERATURE
−20° to + 60°C

STORAGE TEMPERATURE
−30° to + 70°C

VIBRATION
(no mechanical damage; non operating test) 10 g;
1.5 mm amplitude; 10-2000 Hz.

SHOCK
(no mechanical damage; non operating test) 50 g;
11 ms (1/2 sine wave).

PLUNGER TRAVEL
5   mm: SF, SI/SH
5.5 mm: SG/SK

PRETRAVEL
1.9 mm: SF, SI/SH
2.1 mm: SG/SK

OVERTRAVEL
0.8 mm: SF, SI/SH
1.5 mm SG/SK

RELEASE POINT
1.0 mm: SF, SI/SH
1.2 mm: SG/SK

NON-RELEASE POINT
3.0 mm ± 0.2 mm: SG/SK

OPERATING FORCES
SF, SI/SH: 50 ± 10 gr
             80 ± 15 gr
             130 ± 20 gr
             200 ± 40 gr
SG/SK: 50 gr nom.
         80 gr nom.
         130 gr nom.
         200 gr nom.

MATERIAL (except plunger)
Self extinguishable class SE0

CONNECTING PINS
New silver

CLIP FOR PANEL MOUNTING
Stainless steel

SF, SG, SI, SK AND SH SERIES

Momentary (SF) and push-push (SG) versions are available. Illuminated momentary (SI) and illuminated push-push (SK) versions are designed for use as a control key. The SI version can be provided without lamp terminals (SH).
The lamp is located centrally under the keytop giving optimum brightness. Only SF switches can have 2 form A configuration. Lamp terminals are always in position 3-4.
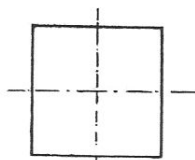
DIMENSIONS

In mm M = 2.54 mm
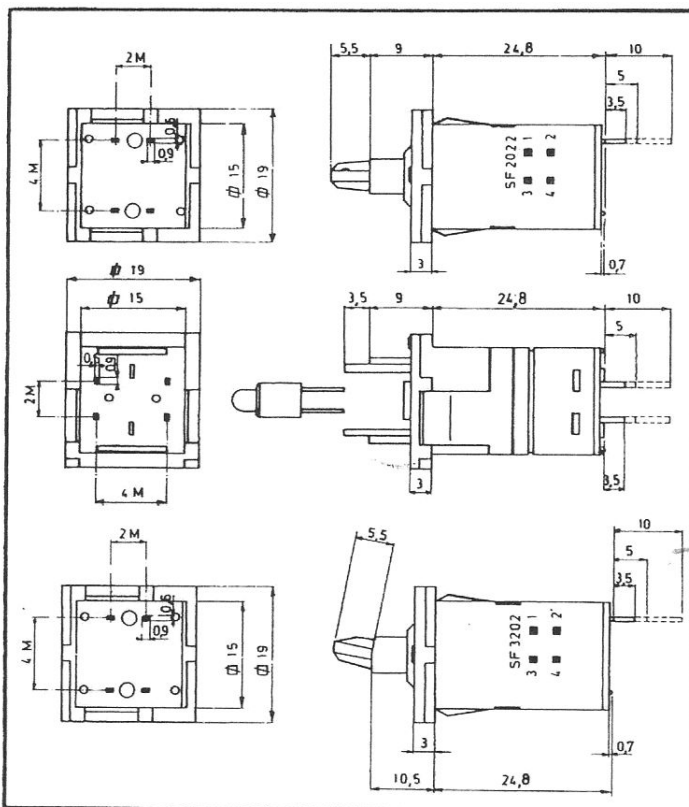
PANEL CUTOUT

Maximum panel thickness: 2 mm

$$\varnothing \quad + 0.1$$
$$15.12 - 0$$

SPECIFICATIONS

CONTACT ARRANGEMENT
1 form A

SWITCHED POWER
3 VA resistive maximum

VOLTAGE
100 Vdc maximum

CURRENT
300 mA maximum

INITIAL CONTACT RESISTANCE
< 300 milliohms

DIELECTRIC STANDOFF (capsule)
200 Vdc - 140 Vrms

CONTACT BOUNCE
1 mS maximum

LIFE EXPENTANCY (operations)
$> 50 \times 10^6$: SFL, SIL
$> 1 \times 10^6$: SGL

OPERATING TEMPERATURE
$-20°$ to $+60°C$

STORAGE TEMPERATURE
$-30°$ to $+70°C$

VIBRATION
(no mechanical damage; non operating test) 10 g;
1.5 mm amplitude; 10-2000 Hz.

SHOCK
(no mechanical damage; non operating test) 50 g;
11 ms (1/2 sine wave).

PLUNGER TRAVEL
4 mm.

PRETRAVEL
0.9 mm

OVERTRAVEL
0.5 mm: SFL, SIL
1.1 mm SGL

RELEASE POINT
0.5 mm

OPERATING FORCES
SFL, SIL: 50 ± 10 gr
80 ± 15 gr
SGL: 50 gr nom.
80 gr nom.

MATERIAL (except plunger)
Self extinguishable class SE0

CONNECTING PINS
New silver, tinned.

SFL, SGL, SIL SERIES

The Low Profile SFL Series uses the same reliable reed contact as the SF and is available in momentary, alternate action, incandescent lighted and LED lighted. Their design is such that they can easily be used to form small or large keyboards. Each SFL switch can use the same keyboard hardware (PCB, frame) as used for the SF when lower profile is required. For stepped keyboards, keyswitches are provided with 11° plunger angle.
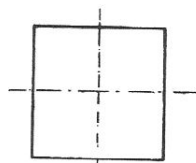
DIMENSIONS

In mm M = 2.54 mm
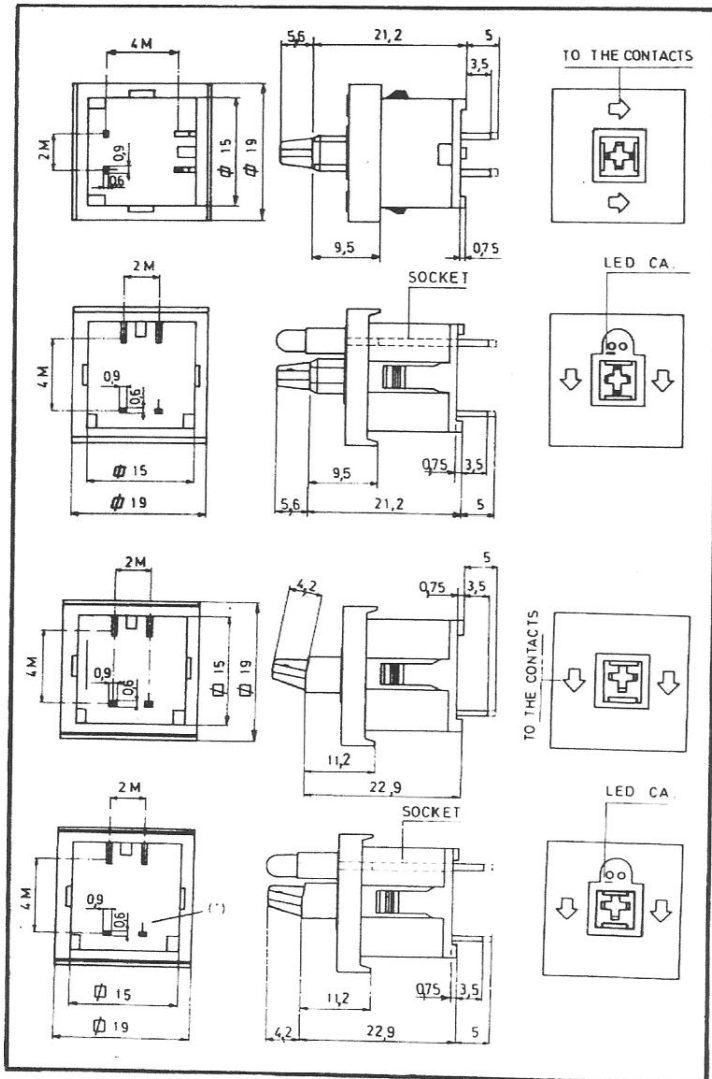
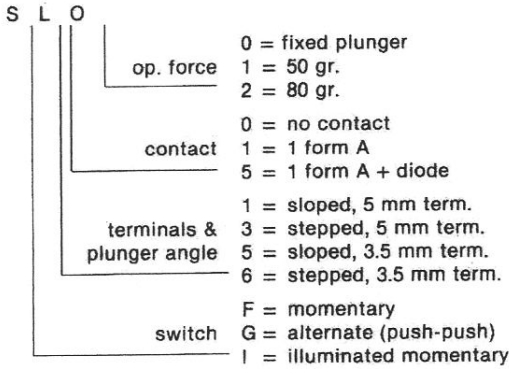
(*) Serial diode connection: cathode side

PANEL CUTOUT

Maximum panel thickness: 1.5 mm

3

SFL SERIES

```
S  L  O
         op. force      0 = fixed plunger
                        1 = 50 gr.
                        2 = 80 gr.

         contact        0 = no contact
                        1 = 1 form A
                        5 = 1 form A + diode

         terminals &    1 = sloped, 5 mm term.
         plunger angle  3 = stepped, 5 mm term.
                        5 = sloped, 3.5 mm term.
                        6 = stepped, 3.5 mm term.

         switch         F = momentary
                        G = alternate (push-push)
                        I = illuminated momentary
```

Example:
SGL6102 is a low profile keyswitch (alternate action),
stepped and 3.5 mm terminals, 1 form A and 80 gr.
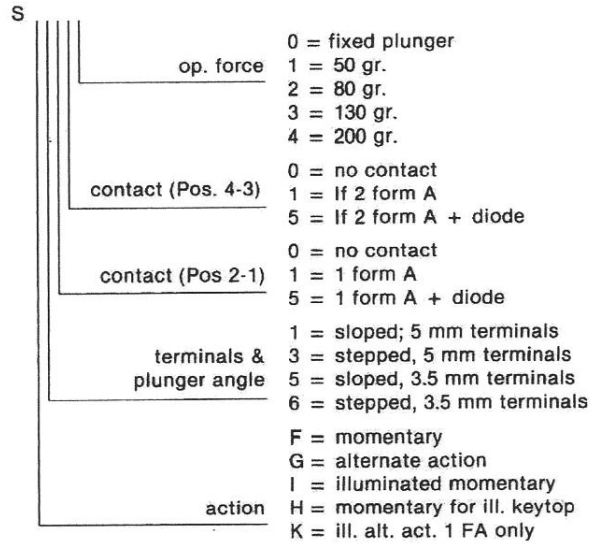operating force.

LAMPS FOR SIL SERIES
- T1 bi-pin standard
  - 5V-75 mA Ref. 104577-00
  - 12V-60 mA Ref. 104577-01
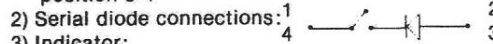 - 18V-26 mA Ref. 104577-02
  - 28V-24 mA Ref. 104577-03

- LED T1 type
  - Red Ref. 104139-00
  - Orange Ref. 104-139-01
  - Yellow Ref. 104139-02
  - Green Ref. 104139-03

- Adapter for LED Ref 104293-00

SF SERIES

```
S
         op. force          0 = fixed plunger
                            1 = 50 gr.
                            2 = 80 gr.
                            3 = 130 gr.
                            4 = 200 gr.

         contact (Pos. 4-3)  0 = no contact
                            1 = If 2 form A
                            5 = If 2 form A + diode

         contact (Pos 2-1)   0 = no contact
                            1 = 1 form A
                            5 = 1 form A + diode

         terminals &         1 = sloped; 5 mm terminals
         plunger angle       3 = stepped, 5 mm terminals
                            5 = sloped, 3.5 mm terminals
                            6 = stepped, 3.5 mm terminals

                            F = momentary
                            G = alternate action
                            I = illuminated momentary
         action             H = momentary for ill. keytop
                            K = ill. alt. act. 1 FA only
```

Notes: 1) For illuminated keyswitch; lamp terminals will be in
          position 3-4
       2) Serial diode connections: 1 4 —/ —k|— 2 3
       3) Indicator:
          SI 1000 & SI 5000 only.

Example: SK3101 is an illuminated keyswitch; alternate action
         stepped and 5 mm terminals 1 form A and 50 gr.
         alternate force.

LAMPS FOR SI & SK SERIES
T-1 bi-pin base lamp with following characteristics:
- 5V-75 mA Part number 100690-00
  - Lamp base: black
- 12V-60 mA Part number 100690-01
  - Lamp base: brown
- 28V-24 mA Part number 100690-02
  - Lamp base: grey
- 18V-26 mA Part number 100690-03
  - Lamp base: blue

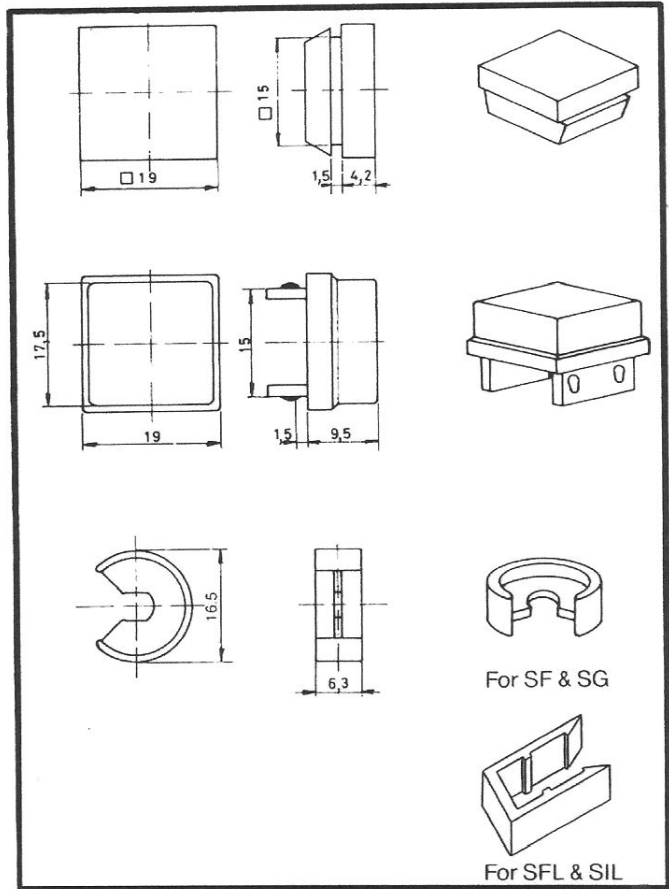# ACCESSORIES FOR REED KEYSWITCHES

HARD RUBBER SPACER

For fitting alongside space bar mechanism at end opposite to switch. This provides a uniform maximum travel at either end of space bar. Can also be used to fill unused holes in frame.
Part number: 102712-00

HIGH PROFILE SPACER

This is one module black square plastic moulded spacer for filling open areas between switches up to the level of keytop bottom.
Part number: 102032-00

BLOCKING RING

- prevent the plunger from moving
- these plastic rings snap over the key switch plunger.
For SF & SG: part number: 102795-00
For SFL & SIL: part number: 105014-00

For SF & SG

For SFL & SIL

SPACE BAR MECHANISM FOR REED KEYSWITCHES

This is a parallel movement component to operate a key-switch mounted alongside. Part number 104607-00.
A BA 8-8 units space bar is available (see BA Series) for fitting to it. The space bar mechanism 104609-00 is the angled version 11°.

The space bar mechanism 104609-00 is the angled version (11°)
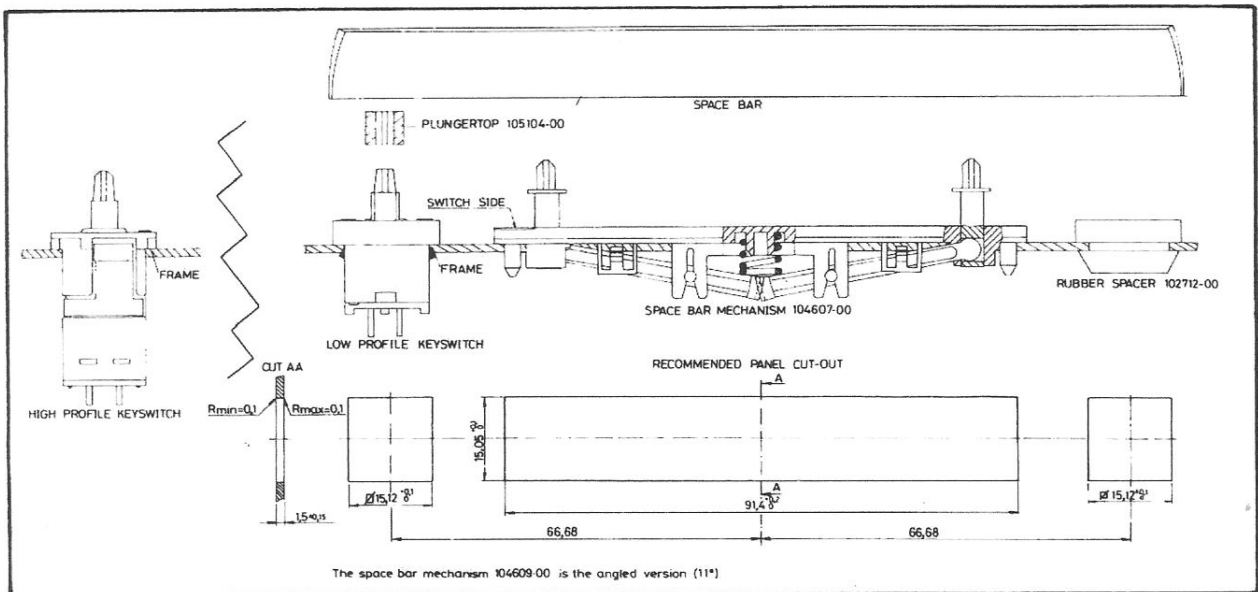
STANDARD KEYTOPS

A wide range of keytops in many sizes and colour combinations is available. A growing library of legends for double-shot moulded keytops can satisfy your individual requirements.

BLANK AND DOUBLE-SHOT MOULDED KEYTOPS

Unit: 1 x 1 unit (BA1)
                               1 x 1.5 unit (BAB)
                               1 x 2 units (BA2)
                               1 x 3 units (BA3)
Keytop finish: mat top
Std colour combination: shell: medium grey (H1)
                               legend : white (T1)
Material: A.B.S.

NOTE

Other shapes and sizes are also available such as 1 1/4 keytop, 1 x 1 3/4 unit keytop, 2 level keytop; etc.
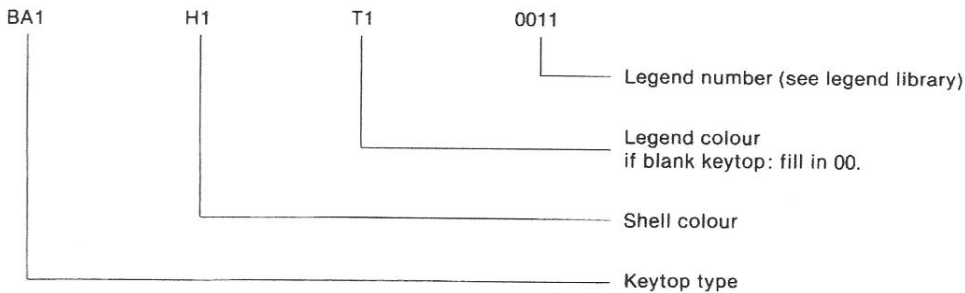
STANDARD COLOURS

Dark grey (D1), light grey (X1) and medium grey (H1)

AVAILABLE COLOURS

B1	blue	O1	orange
D1	dark grey	R1	red
E1	beige	T1	white
G1	green	X1	light grey
H1	medium grey	Y1	yellow
M1	brown	Z1	black

BA1   1 space

BAB   1.5 space

BA2   2 space

BA3   3 space

BA8   8 space (space bar)

ORDERING INFORMATION

BA1   H1   T1   0011

Legend number (see legend library)

Legend colour
if blank keytop: fill in 00.

Shell colour

Keytop type
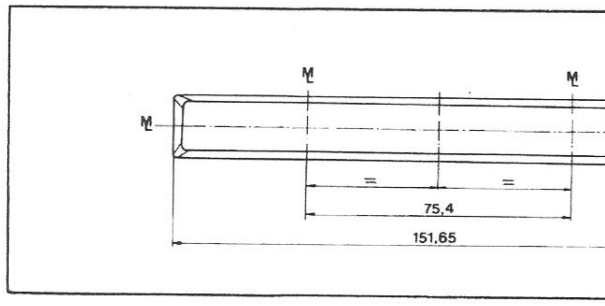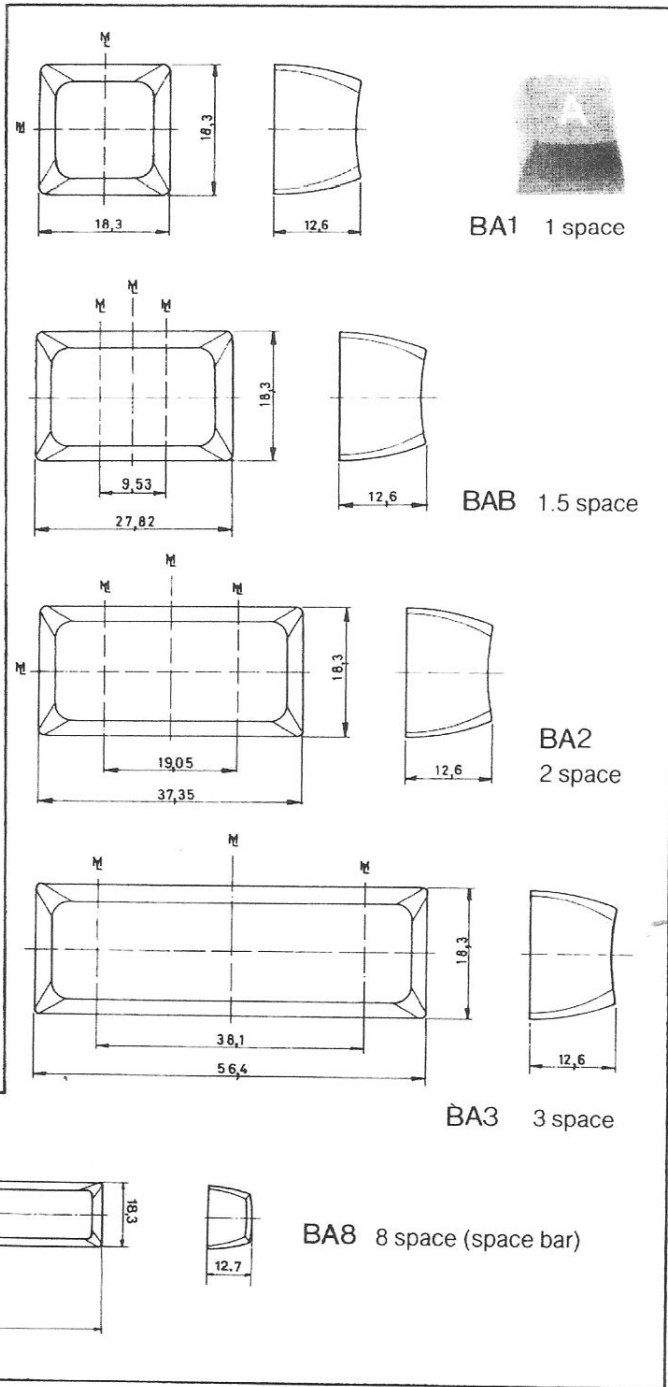
Example: BABR100 0000 is a blank keytop 1 x 1.5 unit, red colour.

# STANDARD LEGEND LIBRARY

Stock items in standard colour combination.

ILLUMINATED KEYTOPS FOR SI, SK AND SH SWITCHES.

ILLUMINATED KEYTOPS (KR., KS. SERIES)
(TOP AND SIDE SURFACES)

Unit: 1 x 1   unit   (KR1, KS1)
       1 x 1.5 unit   (KR9, KS9)
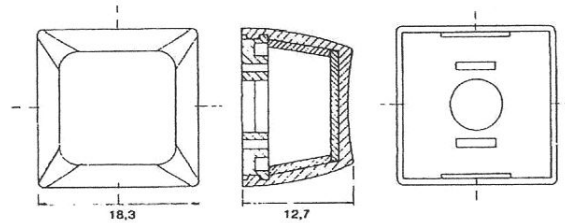   1 x 2   units (KR2, KS2)

This keytop gives an even light output on top and side surfaces.
An angled base can be specified to allow the use of illuminated
switches alongside angled SF-SG types giving a common
appearance (KS. series).
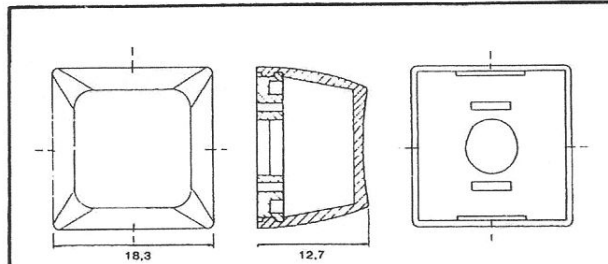
ILLUMINATED KEYTOPS (KD., KE. SERIES)
(TOP SURFACE ONLY)

Unit: 1 x 1   unit   (KD1, KE1)
       1 x 1.5 unit   (KD9, KE9)
   1 x 2   units (KD2, KE2)

These feature a coloured cap with internal apaque spacer
(mask) to give light out of top surface only (KD. Series).
An angled base can be specified to allow the use of illuminated
switches alongside angled SF-SG types giving a common
appearance (KE. Series).

ILLUMINATED KEYTOPS (KI., KJ. SERIES)
### (CHANGEABLE LEGEND)

Unit: 1 x 1   unit   (KI1, KJ1)
       1 x 1.5 unit   (KI9, KJ9)
       1 x 2   units   (KI2, KJ2)

A special version having transparent (clear) cap and coloured
diffuser is available to provide for changeable legends (KI.
Series). An angled base can be specified to allow the use of illu-
minated switches alongside angled SF-SG types giving a
common appearance (KJ. Series).
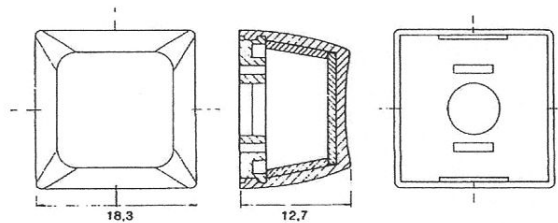
KZ1 SQUARE CHANGEABLE LEGEND
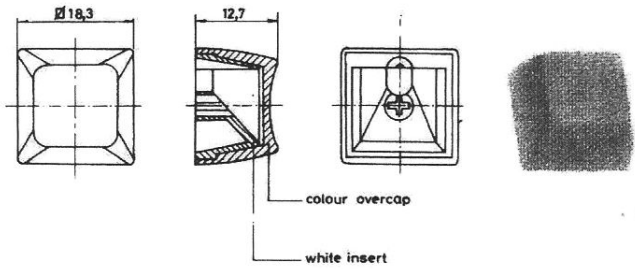Legend keytop with coloured diffuser and clear overcap.
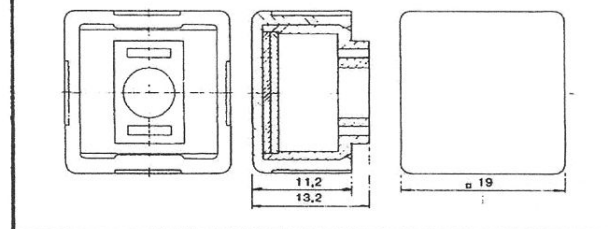
ILLUMINATED KEYTOPS FOR SIL SWITCHES

ILLUMINATED KEYTOPS (K21 SERIES)
(TOP SURFACE ONLY)

Unit:
- 1 x 1 unit (K21)
- 1 x 1.5 unit (K24)
- 1 x 2 units (K27)

Cap colour: blue; yellow; green; orange; red and white

These keytops feature a coloured cap with internal mask to give light out of top surface only.

colour overcap

white insert

ILLUMINATED KEYTOPS (K23 SERIES)
(CHANGEABLE LEGEND)

Unit:
- 1 x 1 unit (K23)(M23)
- 1 x 1.5 unit (K26)
- 1 x 2 units (K29)

Diffuser colours: blue; yellow; green; orange; red and white

These versions, having a clear cap and coloured diffuser, are available to provide changeable legends.

clear overcap

colour diffuser

black insert
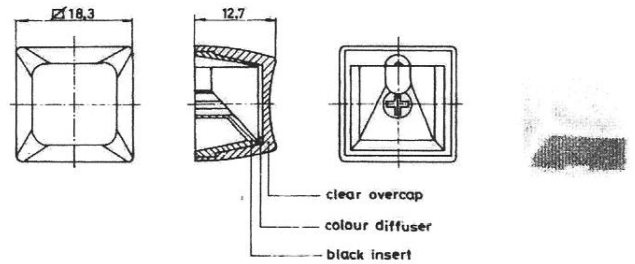
SQUARE CHANGEABLE LEGEND KY1 SERIES

These keytops are square shaped changeable legend with fitted coloured diffuser and clear plastic overcaps.
KY1 Series - for non-illuminated switches SF; SG and SFL, SGL
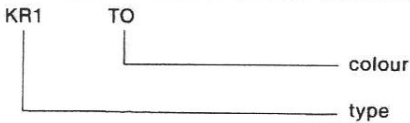- for illuminated switch SIL
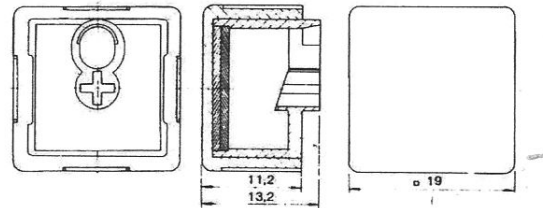
AVAILABLE COLOURS FOR ILLUMINATED KEYTOPS
blue (B)
yellow (Y)
green (G)
orange (O)
red (R)
white (T)
Note: These colours are not equivalent with the colours shown on page 6.

ORDERING INFORMATION FOR ILLUMINATED KEYTOPS

KR1   TO
- colour
- type

LED KEYTOP
Designed for use will SIL switches
Available colours: see page 6.
Reference: BC1   ..   ..   ..
- legend
- legend colour
- keytop colour