Flush Silhouette Switches LB/LBW Series
16mm LB Series Miniature Switches & Pilot Lights

Extended illuminated Pushbutton
Ring-illuminated Pushbutton

LBW Series Flush Silhouette Switches

LB Series Flush Silhouette Switches
ø16mm LB Series Miniature Switches and Pilot Lights

LB Series and LBW Series For diverse applications

Flush silhouette switches and ø16mm miniature switches and pilot lights. Wide variety of switches to choose from.

Extended Illuminated Pushbutton
Ring-Illuminated Pushbutton

New LBW series with large operator surface for easy usability.

Flush Silhouette Switches LB Series
Flush Silhouette Switches LBW Series
ø16mm LB Series Switches and Pilot Lights

Flush bezel projects only 2 mm from front of panel. Standard bezel with only a panel depth of 27.9 mm. Removable contact blocks ideal for single board mounting.

- Pushbuttons, selector switches, and key selector switches with up to 3PDT contacts.
- Wave keys are used for key selector switches to prevent duplication of keys. Six different keys are available besides standard key.
- Black or metallic flush bezels available.
- Bright and clear illumination surface. LED illumination.
- Gold-clad, cross-bar contact, or high-capacity silver contacts.
- Protection degree: IP65 (IEC60529)

Applicable Standards	Mark	File No. or Organization
UL508		UL Recognition No.E55996
CSA 22.2 No.14		CSA File No. LR 21451
EN60947-5-1		TÜV Rheinland
	CE	EU Low Voltage Directive
GB14048.5		

Contact Ratings

Gold Contact (switch base: blue)

Rated Insulation Voltage		250V	
Rated Thermal Current		3A	
Rated Operating Voltage		30V DC	125V AC
Rated Operating Current (electrical life: 100,000 operations)	Resistive Load	0.1A	0.1A
Contact Material		Gold-clad silver	

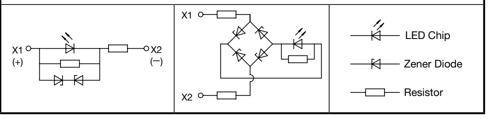
- Minimum applicable load (reference value): 5V AC/DC, 1 mA
  Applicable range is subject to the operating conditions and load.
- See electrical life in Specifications.

Silver Contact (switch base: gray)

Rated Insulation Voltage				250V		
Rated Operating Voltage				30V	125V	250V
Rated Operating Current	Electrical Life 50,000 operations	AC 50/60Hz	Resistive load	—	5A	5A
			Inductive load	—	3A	1.5A
		DC	Resistive load	5A	1.1A	—
			Inductive load	2A	0.4A	—
	Electrical Life 100,000 operations	AC 50/60Hz	Resistive load	—	5A	3A
			Inductive load	—	3A	1.5A
		DC	Resistive load	3A	0.6A	—
			Inductive load	1A	0.22A	—
Rated Thermal Current				5A		
Contact Material				Silver		

- AC inductive load: PF=0.6 to 0.7 DC inductive load: L/R=7 ms max.

LED Ratings

Rated Voltage	5V DC	12V AC/DC	24V AC/DC
Voltage Range	5V DC±5%	12V AC/DC±10%	24V AC/DC ±10%
LED Part No.	LB9Z-LED5②	LB9Z-LED1②	LB9Z-LED2②
Current Draw	A, R, W: 18 mA G, S: 6 mA PW: 5 mA		
Voltage Marking	Marked on the side of the LED unit		
LED Life (reference value)	Approx. 30,000 hours [until the brightness reduces to 50% of the initial value when lit at the rated voltage (direct current) under 25°C environment.]		
Internal Circuit	A, G, R, PW, S、W		
	 X1 (+) X2 (−) X1 X2 LED Chip Zener Diode Resistor		

- ② (color code): A (amber), G (green), PW (pure white), R (red), S (blue), W (white)
- Use the pure white (PW) module for yellow illumination.
- LED lamp contains a current-limiting resistor.

Operating Temperature		–25 to +60°C (no freezing) Illuminated units: –25 to +55°C
Storage Temperature		–30 to +80°C (no freezing)
Operating Humidity		45 to 85% RH (no condensation)
Contact Resistance		50 mΩ maximum (initial value)
Insulation Resistance		100 MΩ minimum (500V DC megger)
Dielectric Strength	Switch Unit	Between live part and ground: 2,000V AC, 1 minute Between terminals of different poles: 2,000V AC, 1 minute Between terminals of the same poles: 1,000V AC, 1 minute
	Illumination Unit	Between live part and ground: 2,000V AC, 1 minute
Vibration Resistance		Operating extremes/Damage limits: 5 to 55 Hz, amplitude 0.5 mm
Shock Resistance		Operating extremes: 100 m/s² Damage limits: 1,000 m/s²
Mechanical Life (minimum operations)		Momentary: 2,000,000 Maintained: 250,000 Selector switches 250,000 Key selector switches 250,000
Electrical Life (minimum operations)		Momentary: 50,000 / 100,000 (∗1) Maintained: 50,000 / 100,000 (∗2) Selector switches: 50,000 / 100,000 (∗2) Key selector switches: 50,000 / 100,000 (∗2)
Degree of Protection		IP65 (IEC 60529)
Terminal Style		Solder/tab terminal #110 PC board terminal
Weight (approx.)		11g (LB3L-M1T24) 10g (LB3P-1T04) 10g (LB3B-M1T2) 12g (LB3S-2T2) 25g (LB3K-2ST2A) 14g (LB8L-M1T24) 13g (LB8P-1T04) 13g (LB8B-M1T2) 15g (LB8S-2T2) 27g (LB8K-2ST2A) 15g (LB8GL-M1T24) 14g (LB8GB-M1T2) 16g (LBW7L-M1T24) 14g (LBW7P-1T04) 15g (LBW7B-M1T2) 17g (LBW7S-2T2) 29g (LBW7K-2ST2A) 17g (LBW7GL-M1T24) 18g (LBW7GB-M1T2)

∗1: Switching frequency 1,800 operations/h.
∗2: Switching frequency 1,200 operations/h.

Flush Silhouette Switches LB Series Illuminated Pushbuttons

Illuminated Pushbuttons

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape

LB①L-②1T③④⑤∗

Round / Black Bezel

Square / Black Bezel

Rectangular / Black Bezel

Round / Metallic Bezel

Square / Metallic Bezel

Rectangular / Metallic Bezel

Round with Guard

Square with Guard

Rectangular with Guard

① Shape	② Operation	③ Contact	④ LED Operating Voltage	Part No.	∗ Illumination Color Code
Black bezel	Momentary	Gold/SPDT	24V AC/DC	**LB①L-M1T14∗**	Specify the color code in place of ∗ in the Part No. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow
		Gold/DPDT		**LB①L-M1T24∗**	
	Maintained	Gold/SPDT	24V AC/DC	**LB①L-A1T14∗**	
		Gold/DPDT		**LB①L-A1T24∗**	
Metallic bezel	Momentary	Gold/SPDT	24V AC/DC	**LB①L-M1T14∗**	
		Gold/DPDT		**LB①L-M1T24∗**	
	Maintained	Gold/SPDT	24V AC/DC	**LB①L-A1T14∗**	
		Gold/DPDT		**LB①L-A1T24∗**	
Guard Type	Momentary	Gold/SPDT	24V AC/DC	**LB①L-M1T14∗**	
		Gold/DPDT		**LB①L-M1T24∗**	
	Maintained	Gold/SPDT	24V AC/DC	**LB①L-A1T14∗**	
		Gold/DPDT		**LB①L-A1T24∗**	

- Illuminated pushbuttons contain an LED unit. For details on LED units, see page 60.
- The guard opens 180 degrees spring-return.
- Illuminated pushbuttons can be used with legend markings. Engraving can be done on a marking plate which is placed in the lens, or a clear film can be printed and placed in the lens. See page 63 for details on the marking plate and film.
- White lens type (when light is off) are available. Clear lens is used instead of colored lens for amber, green, red, and blue illuminated pushbuttons. Amber, green, red, or blue LED units are used. To specify, see Part Number Development below.
- PC board terminals available for gold contacts. Silver contacts also available. To specify, see Part Number Development below.
- 5V DC and 12V AC/DC LED operating voltages also available.
- Other bezel sizes available (LBW series). For details, see page 24.

Part Number Development

LB①L-②1T③④⑤∗

① Shape

Code	Shape
6	Round / Black Bezel
7	Square / Black Bezel
8	Rectangular / Black Bezel
6M	Round / Metallic Bezel
7M	Square / Metallic Bezel
8M	Rectangular / Metallic Bezel
6G	Round with Guard
7G	Square with Guard
8G	Rectangular with Guard

② Operation

Code	Operation
A	Maintained
M	Momentary

③ Contacts

Code	Contact
1	Gold/SPDT
2	Gold/DPDT
5	Silver/SPDT
6	Silver/DPDT

④ LED Operating Voltage

Code	Rated Operating Voltage
1	5V DC
3	12V AC/DC
4	24V AC/DC

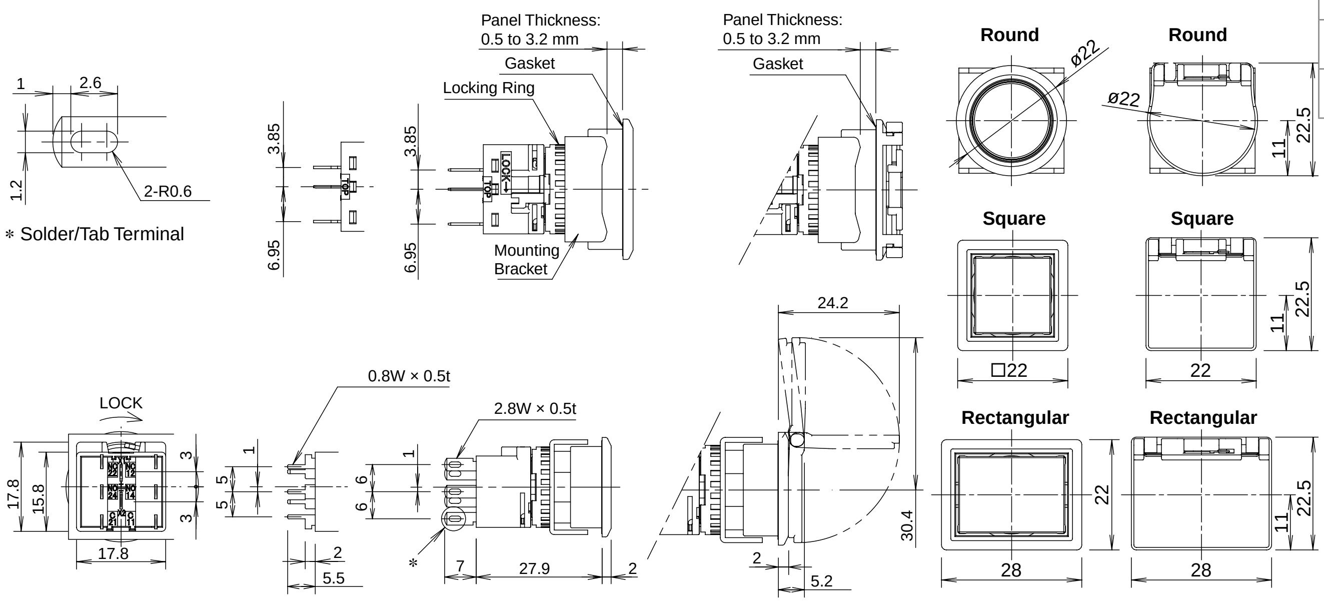
⑤ Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
W	White Lens Type (When Light is Off)	LB6L-M1T14W∗
V	PC Board Terminal (Gold Contact Only)	LB6L-M1T14V∗
VW	White Lens Type (When Light is Off) with PC Board Terminal (Gold Contact Only)	LB6L-M1T14VW∗

- Specify the color code in place of ∗ in the table above.
- Color code for white lens type (when light is off) : A (amber), G (green), R (red), S (blue)

Flush Silhouette LB Series
Flush Silhouette LBW Series
ø16 LB Series
UP Series

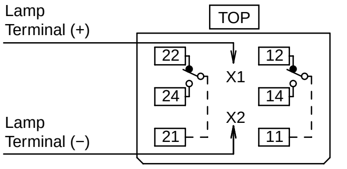
Dimensions


1
2.6
1.2
2-R0.6
∗ Solder/Tab Terminal
3.85
6.95
Panel Thickness: 0.5 to 3.2 mm
Gasket
Locking Ring
Mounting Bracket
LOCK
Round
ø22
Square
□22
22
11
22.5
Rectangular
28
24.2
30.4
0.8W × 0.5t
2.8W × 0.5t
17.8
15.8
3
5
6
1
2
5.5
∗
7
27.9
5.2

[PC Board Terminal] [Solder/Tab Terminal] [With Guard] [With Guard]

All dimensions in mm.

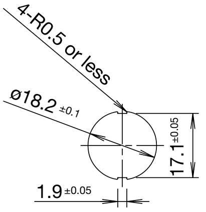
Terminal Arrangement (Bottom View)


Lamp Terminal (+)
Lamp Terminal (−)
TOP
22
24
21
12
14
11
X1
X2

(SPDT contacts on the right only)

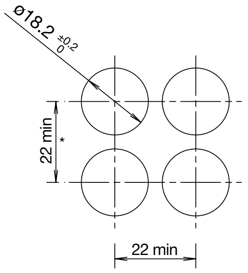
Panel Cut-out for Positioning

Round (LB6L/LB6ML/LB6GL)

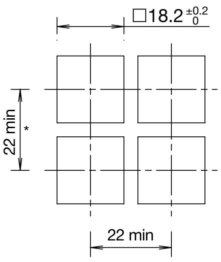

4-R0.5 or less
ø18.2 ±0.1
17.1 ±0.05
1.9 ±0.05

Mounting Hole Layout

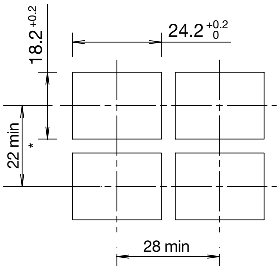
Round (LB6L/LB6ML/LG6GL)


ø18.2 +0.2 0
22 min
∗
22 min

Square (LB7/LB7ML/LB7GL)


□18.2 +0.2 0
22 min
∗
22 min

Square (LB8L/LB8ML/LB8GL)


18.2 +0.2 0
24.2 +0.2 0
22 min
∗
28 min

∗ 45 mm minimum for switches with guard
Note: When using rubber boot or terminal cover, see dimensions on page 57 and 58.

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Illuminated Pushbutton
Pilot Light
Pushbutton
Selector
Illuminated Selector
Key Selector
Lever Switch
Buzzer
Accessories
Maintenance Parts
Panel Cut-out
Instructions

Flush Silhouette Switches LB Series Pilot Lights

Pilot Lights

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape	**LB①P-②T0③④***

Round /
Black Bezel

Square /
Black Bezel

Rectangular /
Black Bezel

Dome /
Black Bezel

Round /
Metallic Bezel

Square /
Metallic Bezel

Rectangular /
Metallic Bezel

Dome /
Metallic Bezel

② Lens Shape	① Shape	③ LED Operating Voltage	Part No.	* Illumination Color Code
Flush	Black Bezel	24V AC/DC	**LB①P-1T04***	Specify the color code in place of * in the Part No. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow
	Metallic Bezel	24V AC/DC	**LB①P-1T04***	
Dome	Black Bezel	24V AC/DC	**LB6P-2T04***	
	Metallic Bezel	24V AC/DC	**LB6MP-2T04***	

- Pilot lights contain an LED unit. For maintenance LED units see page 60.
- Legends and symbols can be engraved on a marking plate or film to be inserted under the lens by users for labelling purposes. See page 63 for details.
- White lens type (when light is off) are available. Clear lens is used instead of colored lens for amber, green, red, and blue pilot lights. Amber, green, red, or blue LED units are used. To specify, see Part Number Development below.
- PC board terminals available. To specify, see Part Number Development below.
- 5V DC and 12V AC/DC LED operating voltages also available.
- Other bezel sizes available (LBW series). For details, see page 26.

Part Number Development

LB①P-②T0③④*

① Shape

Code	Shape
6	Round / Black Bezel
7	Square / Black Bezel
8	Rectangular / Black Bezel
6M	Round / Metallic Bezel
7M	Square / Metallic Bezel
8M	Rectangular / Metallic Bezel

- Round only for dome.

② Lens Shape

Code	Lens Shape
1	Flush
2	Dome

③ LED Operating Voltage

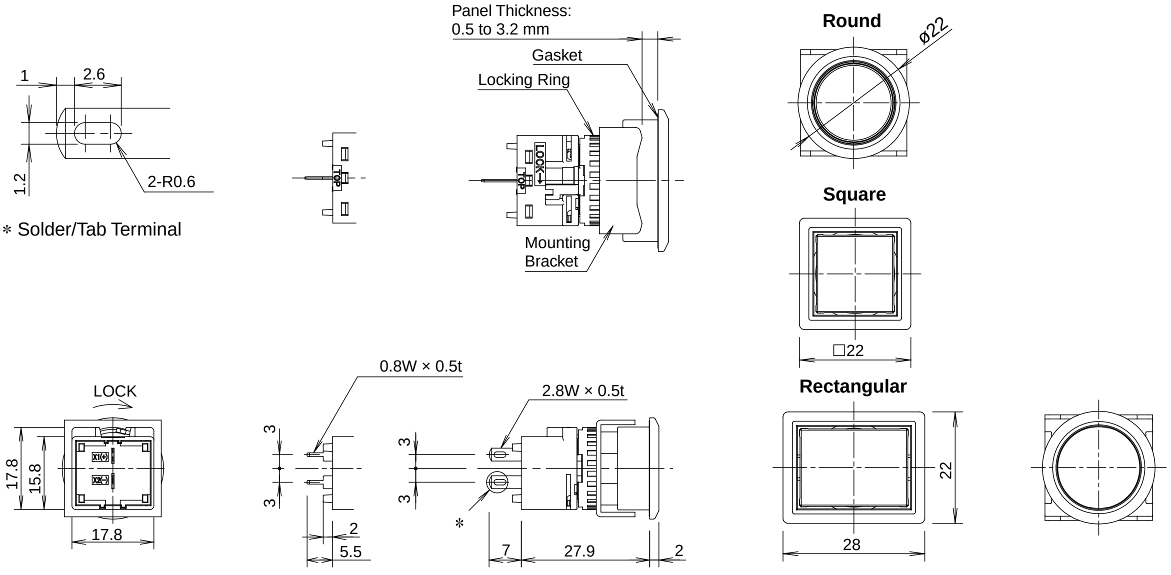
Code	Rated Operating Voltage
1	5V DC
3	12V AC/DC
4	24V AC/DC

⑤ Others

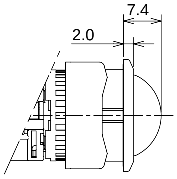
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
W	White Lens Type (When Light is Off)	LB6P-1T04W*
V	PC Board Terminal	LB6P-1T04V*
VW	White Lens Type (When light is Off) with PC Board Terminal	LB6PPM1T04VW*

- Specify the color code in place of * in the table above.
- Color code for white lens type (when light is off) : A (amber), G (green), R (red), S (blue)

Dimensions


Panel Thickness: 0.5 to 3.2 mm
Gasket
Locking Ring
Mounting Bracket
1
2.6
1.2
2-R0.6
* Solder/Tab Terminal
Round
ø22
Square
□22
Rectangular
22
28
LOCK
17.8
15.8
17.8
0.8W × 0.5t
2.8W × 0.5t
3
3
3
3
2
5.5
*
7
27.9
2

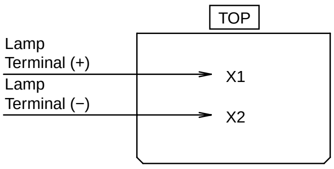
[PC Board Terminal] **[Flush, Solder/Tab Terminal]** **[Flush]** **[Dome]**



[Dome]

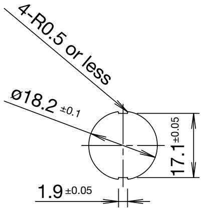
All dimensions in mm.

Terminal Arrangement (Bottom View)


TOP
Lamp Terminal (+)
Lamp Terminal (−)
X1
X2

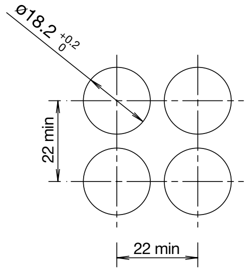
Panel Cut-out for Positioning

Round (LB6P/LB6MP)

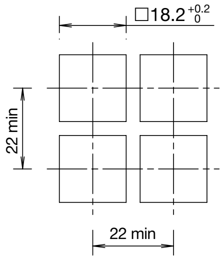

4-R0.5 or less
ø18.2 ±0.1
17.1 ±0.05
1.9 ±0.05

Mounting Hole Layout

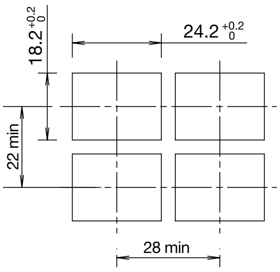
Round (LB6P/LB6MP)


ø18.2 +0.2 0
22 min
22 min

Square (LB7P/LB7MP)


□18.2 +0.2 0
22 min
22 min

Square (LB8P/LB8MP)


18.2 +0.2 0
24.2 +0.2 0
22 min
28 min

Note: When using rubber boot or terminal cover, see dimensions on page 57 and 58.

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Pushbuttons

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape

LB①B-②1T③④*

Round / Black Bezel

Square / Black Bezel

Rectangular / Black Bezel

Round / Metallic Bezel

Square / Metallic Bezel

Rectangular / Metallic Bezel

Round with Guard

Square with Guard

Rectangular with Guard

① Shape	Button Style	② Operation	③ Contact	Part No.		* Color Code
				Gold Contact	Silver Contact	
Black bezel	Button	Momentary	SPDT	LB①B-M1T1*	LB①B-M1T5*	B: black
			DPDT	LB①B-M1T2*	LB①B-M1T6*	G: green
			3PDT	LB①B-M1T3*	LB①B-M1T7*	R: red
		Maintained	SPDT	LB①B-A1T1*	LB①B-A1T5*	S: blue
			DPDT	LB①B-A1T2*	LB①B-A1T6*	W: white
			3PDT	LB①B-A1T3*	LB①B-A1T7*	Y: yellow
	Lens	Momentary	SPDT	LB①B-M1T1L*	LB①B-M1T5L*	A: amber
			DPDT	LB①B-M1T2L*	LB①B-M1T6L*	G: green
			3PDT	LB①B-M1T3L*	LB①B-M1T7L*	R: red
		Maintained	SPDT	LB①B-A1T1L*	LB①B-A1T5L*	S: blue
			DPDT	LB①B-A1T2L*	LB①B-A1T6L*	W: white
			3PDT	LB①B-A1T3L*	LB①B-A1T7L*	Y: yellow
Metallic bezel	Button	Momentary	SPDT	LB①B-M1T1*	LB①B-M1T5*	B: black
			DPDT	LB①B-M1T2*	LB①B-M1T6*	G: green
			3PDT	LB①B-M1T3*	LB①B-M1T7*	R: red
		Maintained	SPDT	LB①B-A1T1*	LB①B-A1T5*	S: blue
			DPDT	LB①B-A1T2*	LB①B-A1T6*	W: white
			3PDT	LB①B-A1T3*	LB①B-A1T7*	Y: yellow
	Lens	Momentary	SPDT	LB①B-M1T1L*	LB①B-M1T5L*	A: amber
			DPDT	LB①B-M1T2L*	LB①B-M1T6L*	G: green
			3PDT	LB①B-M1T3L*	LB①B-M1T7L*	R: red
		Maintained	SPDT	LB①B-A1T1L*	LB①B-A1T5L*	S: blue
			DPDT	LB①B-A1T2L*	LB①B-A1T6L*	W: white
			3PDT	LB①B-A1T3L*	LB①B-A1T7L*	Y: yellow
Guard Type	Button	Momentary	SPDT	LB①B-M1T1*	LB①B-M1T5*	B: black
			DPDT	LB①B-M1T2*	LB①B-M1T6*	G: green
			3PDT	LB①B-M1T3*	LB①B-M1T7*	R: red
		Maintained	SPDT	LB①B-A1T1*	LB①B-A1T5*	S: blue
			DPDT	LB①B-A1T2*	LB①B-A1T6*	W: white
			3PDT	LB①B-A1T3*	LB①B-A1T7*	Y: yellow
	Lens	Momentary	SPDT	LB①B-M1T1L*	LB①B-M1T5L*	A: amber
			DPDT	LB①B-M1T2L*	LB①B-M1T6L*	G: green
			3PDT	LB①B-M1T3L*	LB①B-M1T7L*	R: red
		Maintained	SPDT	LB①B-A1T1L*	LB①B-A1T5L*	S: blue
			DPDT	LB①B-A1T2L*	LB①B-A1T6L*	W: white
			3PDT	LB①B-A1T3L*	LB①B-A1T7L*	Y: yellow

- The guard opens 180 degrees spring-return.
- Illuminated pushbuttons can be used with legend markings. Engraving can be done on a marking plate which is placed in the lens, or a clear film can be printed and placed in the lens. See page 63 for details on the marking plate and film.
- Black is available for lens. Black lens consists of a transparent lens and a black marking plate. To specify, see Part Number Development below.
- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- Other bezel sizes available (LBW series). For details, see page 28.

Part Number Development LB①B-②1T③④*

① Shape

Code	Shape
6	Round / Black Bezel
7	Square / Black Bezel
8	Rectangular / Black Bezel
6M	Round / Metallic Bezel
7M	Square / Metallic Bezel
8M	Rectangular / Metallic Bezel
6G	Round with Guard
7G	Square with Guard
8G	Rectangular with Guard

② Operation

Code	Operation
A	Maintained
M	Momentary

③ Contacts

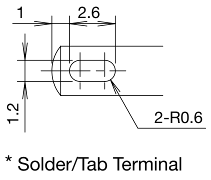
Code	Contact	Code	Contact
1	Gold/SPDT	5	Silver/SPDT
2	Gold/DPDT	6	Silver/DPDT
3	Gold/3PDT	7	Silver/3PDT

④ Others

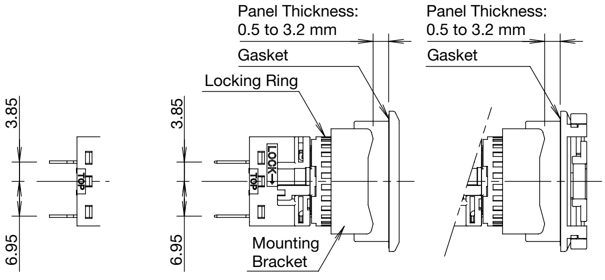
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
B	Black Translucent Lens (Lens Only)	LB6B-M1T1LB
V	PC Board Terminal (Gold Contact Only)	LB6B-M1T1V*

Dimensions

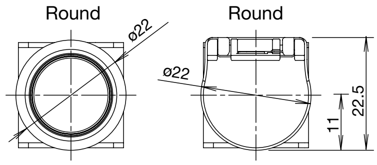
All dimensions in mm.

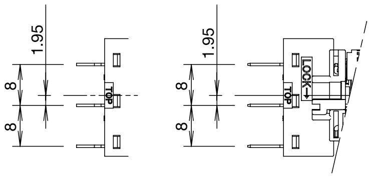


* Solder/Tab Terminal

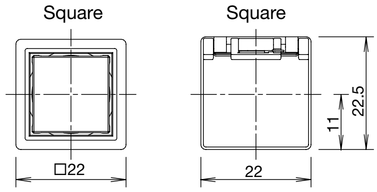

Panel Thickness: 0.5 to 3.2 mm
Gasket
Locking Ring
Panel Thickness: 0.5 to 3.2 mm
Gasket
3.85
6.95
3.85
6.95
Mounting Bracket

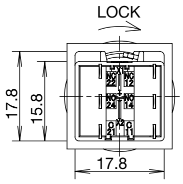
[SPDT/DPDT]


Round
ø22
Round
ø22
11
22.5

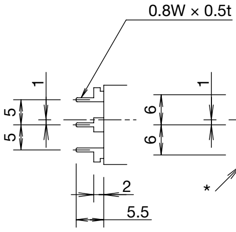

1.95
8
8
1.95
8
8

[3PDT]

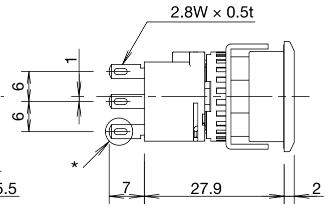

Square
□22
Square
22
11
22.5


LOCK
17.8
15.8
17.8

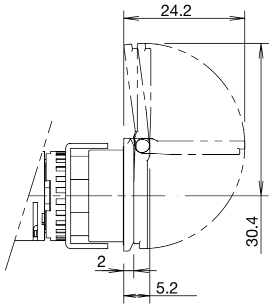
[SPDT/DPDT]


0.8W × 0.5t
1
5
5
2
5.5

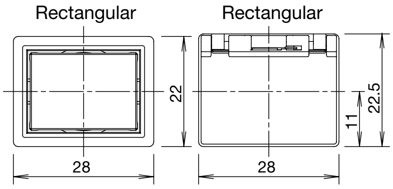
[PC Board Terminal]


2.8W × 0.5t
1
6
6
*
7
27.9
2

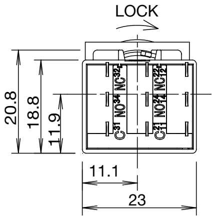
[Solder/Tab Terminal]



[With Guard]


Rectangular
22
28
Rectangular
28
11
22.5

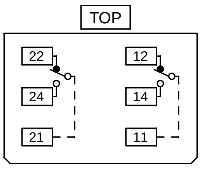
[With Guard]


LOCK
20.8
18.8
11.9
11.1
23

[3PDT]

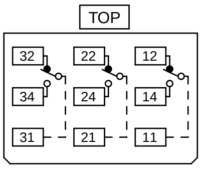
Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts


TOP
22
12
24
14
21
11

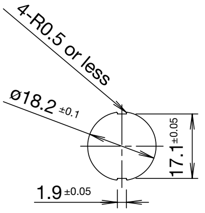
(SPDT contacts on the right only)

3PDT Contacts


TOP
32
22
12
34
24
14
31
21
11

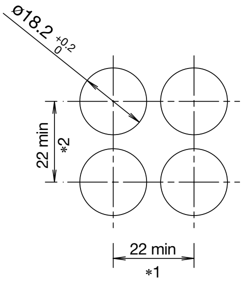
Panel Cut-out for Positioning

Round (LB6B/LB6MB/LB6GB)

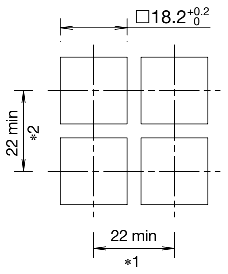

4-R0.5 or less
ø18.2 ±0.1
17.1 ±0.05
1.9 ±0.05

Mounting Hole Layout

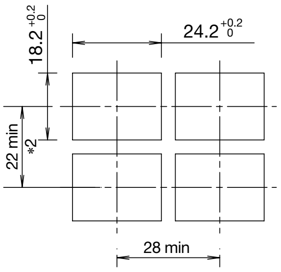
Round (LB6B/LB6MB/LB6GB)


ø18.2 +0.2 0
22 min
*2
22 min
*1

Square (LB7B/LB7MB/LB7GB)


□18.2 +0.2 0
22 min
*2
22 min
*1

Rectangular (LB8B/LB8MB/LB8GB)


18.2 +0.2 0
24.2 +0.2 0
22 min
*2
28 min

*1: 23.2 mm minimum for 3PDT
*2: 45 mm minimum for switches with guard
Note: When using rubber boot or terminal cover, see dimensions on page 57 and 58.

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Selector Switches

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape

LB①S-②③T④⑤

Knob Operator

Round / Black Bezel

Square / Black Bezel

Rectangular / Black Bezel

Round / Metallic Bezel

Square / Metallic Bezel

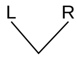
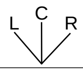
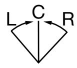
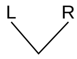
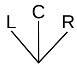
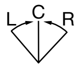
Rectangular / Metallic Bezel

Lever Operator

Round / Metallic Bezel

Square / Metallic Bezel

Rectangular / Metallic Bezel

① Shape	② Operator Position		③ Contact	Part No.	
				Gold Contact	Silver Contact
Black bezel	90° 2-position	Maintained 	SPDT	**LB①S-2T1**	**LB①S-2T5**
			DPDT	**LB①S-2T2**	**LB①S-2T6**
			3PDT	**LB①S-2T3**	**LB①S-2T7**
	45° 3-position	Maintained 	DPDT	**LB①S-3T2**	**LB①S-3T6**
			3PDT	**LB①S-3T3**	**LB①S-3T7**
		Spring return two-way 	DPDT	**LB①S-33T2**	**LB①S-33T6**
			3PDT	**LB①S-33T3**	**LB①S-33T7**
Metallic bezel	90° 2-position	Maintained 	SPDT	**LB①S-2T1**	**LB①S-2T5**
			DPDT	**LB①S-2T2**	**LB①S-2T6**
			3PDT	**LB①S-2T3**	**LB①S-2T7**
	45° 3-position	Maintained 	DPDT	**LB①S-3T2**	**LB①S-3T6**
			3PDT	**LB①S-3T3**	**LB①S-3T7**
		Spring return two-way 	DPDT	**LB①S-33T2**	**LB①S-33T6**
			3PDT	**LB①S-33T3**	**LB①S-33T7**

- Lever operators also available. To specify, see Part Number Development below.
- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- 2-position spring return from right, 3-position spring return from right, and 3-position spring return from left also available. To specify, see Part Number Development below.
- For contact operation, see page 48.
- Other bezel sizes available (LBW series). For details, see page 30.

Part Number Development

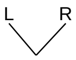
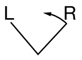
LB①S-②③T④⑤

① Shape

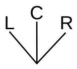
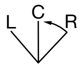
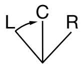
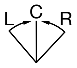
Code	Shape
6	Round / Black Bezel
7	Square / Black Bezel
8	Rectangular / Black Bezel
6M	Round / Metallic Bezel
7M	Square / Metallic Bezel
8M	Rectangular / Metallic Bezel

② Operator Position

2-position

Operator Position	
2 Maintained 	**21** Spring return from right 

3-position

Operator Position			
3 Maintained 	**31** Spring return from right 	**32** Spring return from left 	**33** Spring return two-way 

③ Operator

Code	Operator Shape
Blank	Knob
L	Lever

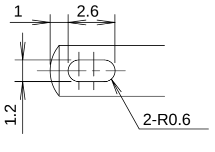
④ Contacts

Code	Contact
1	Gold/SPDT (90° 2-position only)
2	Gold/DPDT
3	Gold/3PDT
5	Silver/SPDT (90° 2-position only)
6	Silver/DPDT
7	Silver/3PDT

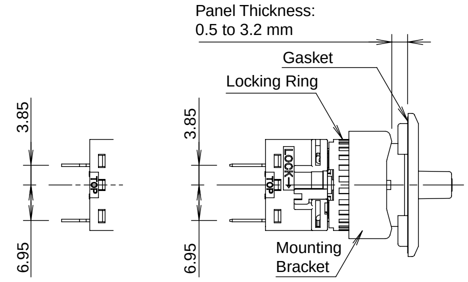
⑤ Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
V	PC Board Terminal (Gold Contact Only)	LB6S-2T1V

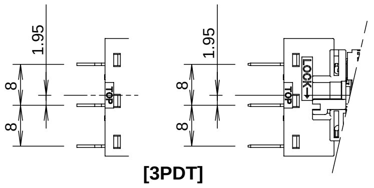
Dimensions



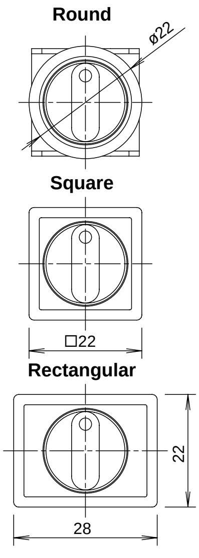
∗ Solder/Tab Terminal


Panel Thickness: 0.5 to 3.2 mm
Gasket
Locking Ring
3.85
6.95
3.85
6.95
Mounting Bracket
LOCK
TOP

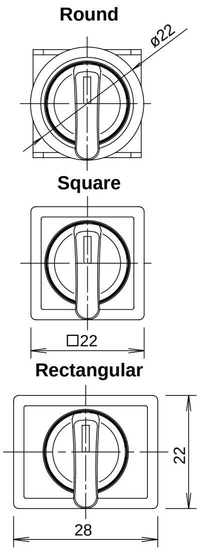
[SPDT/DPDT]


1.95
8
8
1.95
8
8
LOCK
TOP

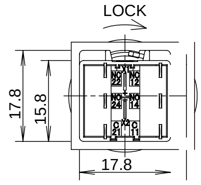
[3PDT]


Round
ø22
Square
□22
Rectangular
22
28

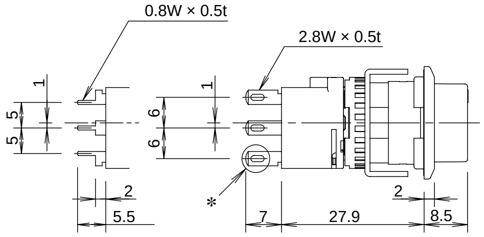
[Knob Operator]


Round
ø22
Square
□22
Rectangular
22
28

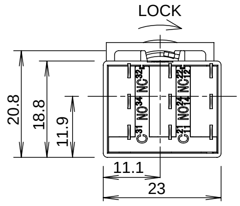
[Lever Operator]


LOCK
17.8
15.8
17.8

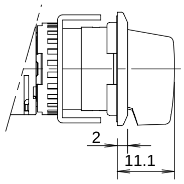
[SPDT/DPDT]


0.8W × 0.5t
1
5
5
2
5.5
2.8W × 0.5t
1
6
6
∗
7
27.9
2
8.5

[PC Board Terminal] **[Knob Operator PC Board Terminal]**


LOCK
20.8
18.8
11.9
11.1
23

[3PDT]

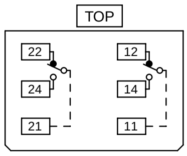


[Lever Operator]

All dimensions in mm.

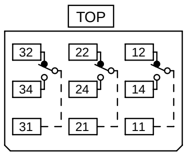
Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts


TOP
22
12
24
14
21
11

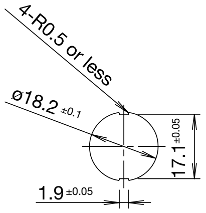
(SPDT contacts on the right only)

3PDT Contacts


TOP
32
22
12
34
24
14
31
21
11

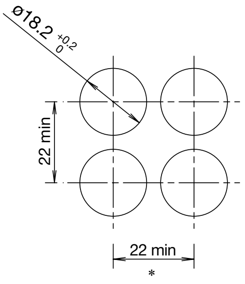
Panel Cut-out for Positioning

Round (LB6S/LB6MS)

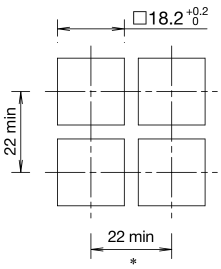

4-R0.5 or less
ø18.2 ±0.1
17.1 ±0.05
1.9 ±0.05

Mounting Hole Layout

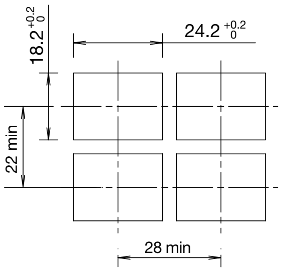
Round (LB6S/LB6MS)


ø18.2 +0.2 0
22 min
22 min
∗

Square (LB7S/LB7MS)


□18.2 +0.2 0
22 min
22 min
∗

Rectangular (LB8S/LB8MS)


18.2 +0.2 0
24.2 +0.2 0
22 min
28 min

∗: 23.2 mm minimum for 3PDT
Note: When using rubber boot or terminal cover, see dimensions on page 58.

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Illuminated Selector Switches

Solder/Tab Terminal

Package Quantity:1

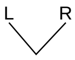
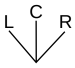
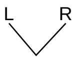
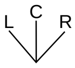
Part No. / Shape

LB①F-②T③④⑤*

Round / Black Bezel

Square / Black Bezel

Round / Metallic Bezel

① Shape	② Operator Position		③ Contact	④ LED Operating Voltage	Part No.		* Illumination Color Code
					Gold Contact	Silver Contact	
Black bezel	90° 2-position	Maintained 	SPDT	24V AC/DC	**LB①F-2T14***	**LB①F-2T54***	Specify the color code in place of * in the Part No. G: green R: red W: white
			DPDT	24V AC/DC	**LB①F-2T24***	**LB①F-2T64***	
	45° 3-position	Maintained 	DPDT	24V AC/DC	**LB①F-3T24***	**LB①F-3T64***	
Metallic bezel	90° 2-position	Maintained 	SPDT	24V AC/DC	**LB①F-2T14***	**LB①F-2T54***	
			DPDT	24V AC/DC	**LB①F-2T24***	**LB①F-2T64***	
	45° 3-position	Maintained 	DPDT	24V AC/DC	**LB①F-3T24***	**LB①F-3T64***	

- Illuminated selector switches contain an LED unit. For maintenance LED units see page 60.
- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- 5V DC and 12V AC/DC LED operating voltages also available. To specify, see Part Number Development below.
- For contact operation, see page 48.

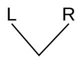
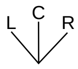
Part Number Development

LB①F-②T③④⑤*

① Shape

Code	Shape
6	Round / Black Bezel
6M	Round / Metallic Bezel

② Operator Position

2-position	3-position
Operator Position	
2 Maintained	**3** Maintained
	

③ Contacts

Code	Contact
1	Gold/SPDT (90° 2-position only)
2	Gold/DPDT
5	Silver/SPDT (90° 2-position only)
6	Silver/DPDT

④ LED Operating Voltage

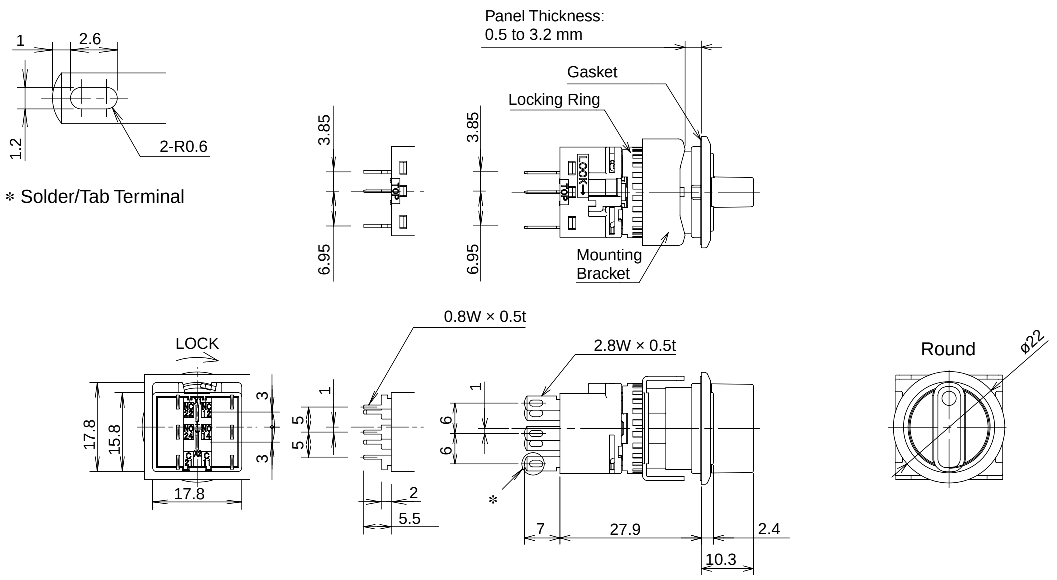
Code	Rated Operating Voltage
1	5V DC
3	12V AC/DC
4	24V AC/DC

⑤ Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
V	PC Board Terminal (Gold Contact Only)	LB6F-2T14V*

- Specify a color code in place of * in the Part No.

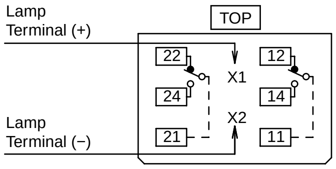
Dimensions


1
2.6
1.2
2-R0.6
* Solder/Tab Terminal
Panel Thickness:
0.5 to 3.2 mm
Gasket
Locking Ring
3.85
6.95
3.85
6.95
Mounting
Bracket
0.8W × 0.5t
2.8W × 0.5t
LOCK
17.8
15.8
17.8
3
3
1
5
5
2
5.5
6
6
*
7
27.9
2.4
10.3
Round
ø22

[PC Board Terminal] **[Solder/Tab Terminal]**

All dimensions in mm.

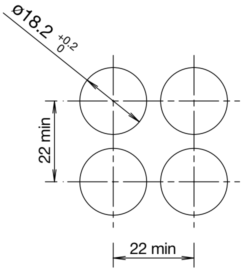
Terminal Arrangement (Bottom View)


Lamp
Terminal (+)
Lamp
Terminal (–)
TOP
22
24
21
12
14
11
X1
X2

(SPDT contacts on the right only)

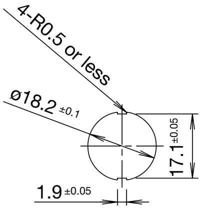
Mounting Hole Layout

Round (LB6F/LB6MF)


ø18.2 +0.2 0
22 min
22 min

Panel Cut-out for Positioning

Round (LB6F/LB6MF)


4-R0.5 or less
ø18.2 ±0.1
17.1 ±0.05
1.9 ±0.05

Note: When using terminal cover, see dimensions on page 58.

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Flush Silhouette Switches LB Series Key Selector Switches

Key Selector Switches

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape	LB①K-②③T④⑤-⑥
	Round / Black Bezel Square / Black Bezel Rectangular / Black Bezel Round / Metallic Bezel Square / Metallic Bezel Rectangular / Metallic Bezel

① Shape	② Operator Position		⑤ Key Removable Position		④ Contact	Part No.	
						Gold Contact	Silver Contact
Black bezel	90° 2-position	Maintained	A: Key removable in all positions	Ⓛ Ⓡ	SPDT	**LB①K-2ST1A**	**LB①K-2ST5A**
					DPDT	**LB①K-2ST2A**	**LB①K-2ST6A**
					3PDT	**LB①K-2ST3A**	**LB①K-2ST7A**
	45° 3-position	Maintained	A: Key removable in all positions	Ⓛ Ⓒ Ⓡ	DPDT	**LB①K-3ST2A**	**LB①K-3ST6A**
					3PDT	**LB①K-3ST3A**	**LB①K-3ST7A**
Metallic bezel	90° 2-position	Maintained	A: Key removable in all positions	Ⓛ Ⓡ	SPDT	**LB①K-2ST1A**	**LB①K-2ST5A**
					DPDT	**LB①K-2ST2A**	**LB①K-2ST6A**
					3PDT	**LB①K-2ST3A**	**LB①K-2ST7A**
	45° 3-position	Maintained	A: Key removable in all positions	Ⓛ Ⓒ Ⓡ	DPDT	**LB①K-3ST2A**	**LB①K-3ST6A**
					3PDT	**LB①K-3ST3A**	**LB①K-3ST7A**

- For operator position, see Part Number Development below.
- For key removable position, see Part Number Development below. The key cannot be removed at the return position.
- Two keys are supplied.
- Besides the standard key (key number 0H), six other keys are available. To specify, see Part Number Development below.
- Disc tumbler keys also available. Only the standard key is available. To specify, see Part Number Development below.
- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- For contact operation, see page 48.
- Other bezel sizes available (LBW series). For details, see page 32.

Part Number Development

LB①K-②③T④⑤-⑥

① Shape

Code	Shape
6	Round / Black Bezel
7	Square / Black Bezel
8	Rectangular / Black Bezel
6M	Round / Metallic Bezel
7M	Square / Metallic Bezel
8M	Rectangular / Metallic Bezel

② Operator Position

Code	Operator Position
2	90° 2-position maintained
21	90° 2-position spring return from right
3	45° 3-position maintained
31	45° 3-position spring return from right
32	45° 3-position spring return from left
33	45°-3-position spring return two-way

③ Key Style

Code	Key Style
S	Wave key
Blank	Disc tumbler key

⑤ Key Number

Code	
Blank	Standard key (0H)
1H to 2H	Reversible key
3H to 6H	Non-reversible key

- Wave key only.

④ Contacts

Code	Contact
1	Gold/SPDT (90° 2-position only)
2	Gold/DPDT
3	Gold/3PDT
5	Silver/SPDT (90° 2-position only)
6	Silver/DPDT
7	Silver/3PDT

⑤ Key Removal Position

2-position

Key Removable Position		
A: Key removable in all positions Ⓛ Ⓡ	**B:** Key removable at left Ⓛ 🅡	**C:** Key removable at right 🅛 Ⓡ

Spring return from right
Ⓛ ← 🅡

3-position

Key Removable Position			
A: Key removable in all positions Ⓛ Ⓒ Ⓡ	**B:** Key removable at left / center Ⓛ Ⓒ 🅡	**C:** Key removable at center / right 🅛 Ⓒ Ⓡ	**D:** Key removable at center 🅛 Ⓒ 🅡
E: Key removable at right / left Ⓛ 🅒 Ⓡ	**G:** Key removable at left Ⓛ 🅒 🅡	**H:** Key removable at right 🅛 🅒 Ⓡ	

For key selectors with the following operations, the key cannot be removed at the return position.

3-position

Spring return from right	Spring return from left	Spring return two-way
Ⓛ Ⓒ ← 🅡	🅛 → Ⓒ Ⓡ	🅛 → Ⓒ ← 🅡

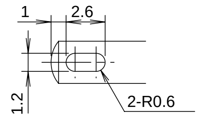
- Key is removable at Ⓛ, Ⓒ, Ⓡ. Key is retained at 🅛, 🅒, and 🅡.

Others

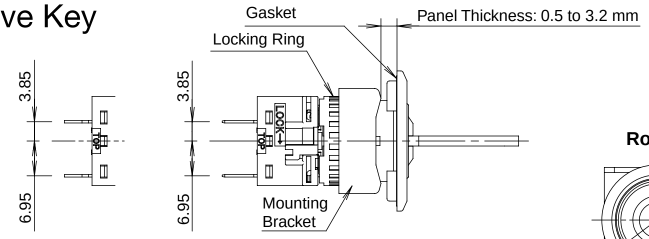
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
V	PC Board Terminal (Gold Contact Only)	LB6K-2ST1VA

Dimensions

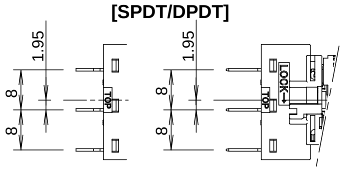
Key Selector Switches with Wave Key



∗ Solder/Tab Terminal

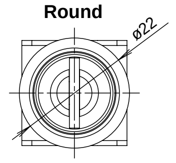

Gasket
Locking Ring
Panel Thickness: 0.5 to 3.2 mm
3.85
6.95
3.85
6.95
Mounting Bracket

[SPDT/DPDT]

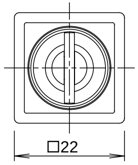

1.95
8
8
1.95
8
8

[3PDT]

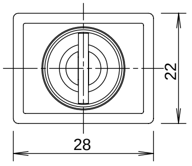
Round

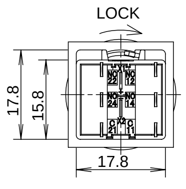


Square

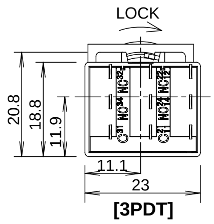


Rectangular

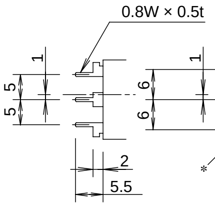



LOCK
17.8
15.8
17.8

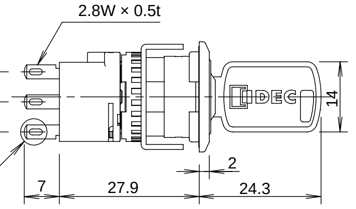
[SPDT/DPDT]


LOCK
20.8
18.8
11.9
11.1
23

[3PDT]

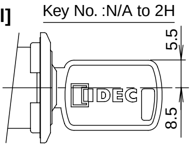

0.8W × 0.5t
1
5
5
6
6
1
2
5.5

[PC Board Terminal]


2.8W × 0.5t
∗
IDEC
14
7
27.9
2
24.3

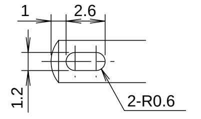
[Solder/Tab Terminal]

Key No. :N/A to 2H

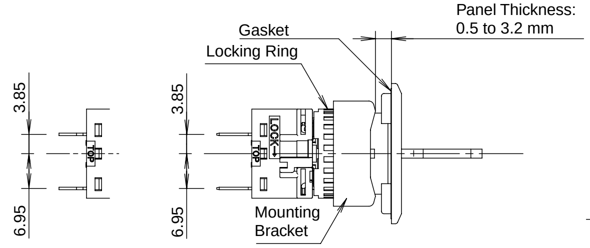


Key No. :3H to 6H

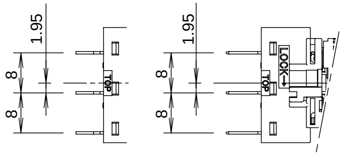
Key Selector Switches with Disc Tumbler Key



∗ Solder/Tab Terminal

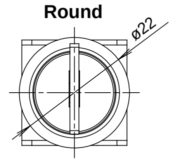

Panel Thickness: 0.5 to 3.2 mm
Gasket
Locking Ring
3.85
6.95
3.85
6.95
Mounting Bracket

[SPDT/DPDT]

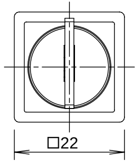

1.95
8
8
1.95
8
8

[3PDT]

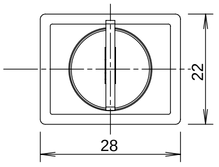
Round

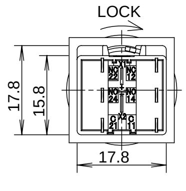


Square

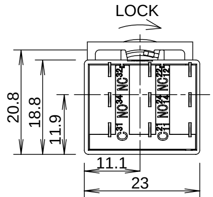


Rectangular

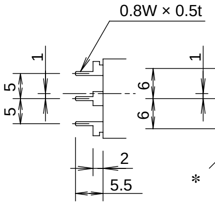



LOCK
17.8
15.8
17.8

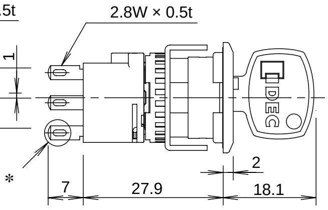
[SPDT/DPDT]


LOCK
20.8
18.8
11.9
11.1
23

[3PDT]


0.8W × 0.5t
1
5
5
6
6
1
2
5.5

[PC Board Terminal]

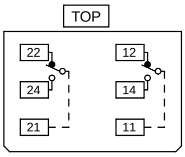

2.8W × 0.5t
∗
IDEC
7
27.9
2
18.1

[Solder/Tab Terminal]

Terminal Arrangement (Bottom View)

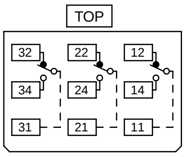
All dimensions in mm.

SPDT/DPDT Contacts


TOP
22
12
24
14
21
11

(SPDT contacts on the right only)

3PDT Contacts


TOP
32
22
12
34
24
14
31
21
11

- For details on mounting hole layout, see page 49.
- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

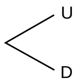
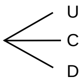
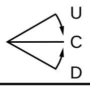
Flush Silhouette Switches LB Series Lever Switches

Lever Switches

Solder/Tab Terminal

Package Quantity: 1

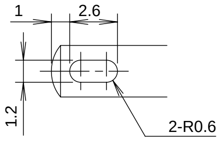
Part No. / Shape	
	Round / Black Bezel

Shape	Operator Position		Contact	Part No.	
				Gold Contact	Silver Contact
Black bezel	2-position	Maintained 	SPDT	**LB6T-2T1**	**LB6T-2T5**
			DPDT	**LB6T-2T2**	**LB6T-2T6**
			3PDT	**LB6T-2T3**	**LB6T-2T7**
	3-position	Maintained 	DPDT	**LB6T-3T2**	**LB6T-3T6**
			3PDT	**LB6T-3T3**	**LB6T-3T7**
		Spring return from top/bottom 	DPDT	**LB6T-33T2**	**LB6T-33T6**
			3PDT	**LB6T-33T3**	**LB6T-33T7**

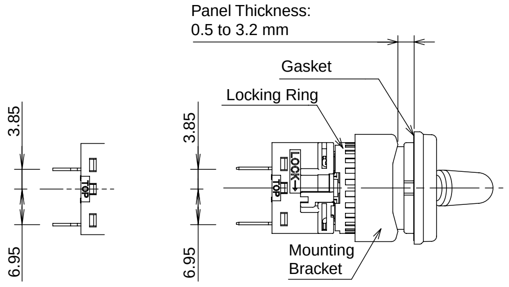
- PC board terminals available for gold contacts. Add "**V**" to the Part No.
  Example: **LB6T-2T1V**
- For contact operation, see page 48.

Flush Silhouette LB Series
Flush Silhouette LBW Series
ø16 LB Series
UP Series

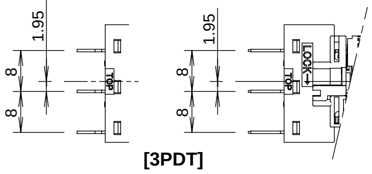
Dimensions



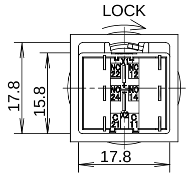
* Solder/Tab Terminal


Panel Thickness:
0.5 to 3.2 mm
Gasket
Locking Ring
Mounting
Bracket
3.85
6.95
3.85
6.95
TOP
LOCK

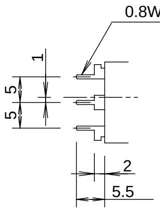
[SPDT/DPDT]


1.95
8
8
1.95
8
8
TOP
LOCK

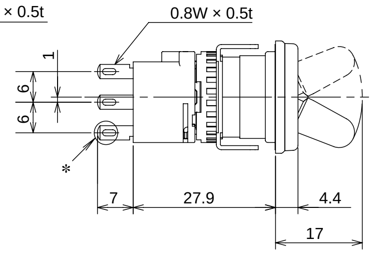
[3PDT]


LOCK
17.8
15.8
17.8

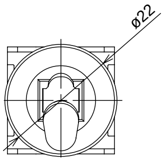
[SPDT/DPDT]

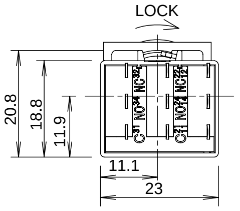

0.8W × 0.5t
1
5
5
2
5.5

[PC Board Terminal]


0.8W × 0.5t
1
6
6
*
7
27.9
4.4
17

[Solder/Tab Terminal]



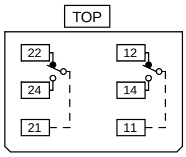

LOCK
20.8
18.8
11.9
11.1
23

[3PDT]

All dimensions in mm.

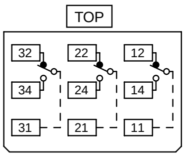
Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts


TOP
22
12
24
14
21
11

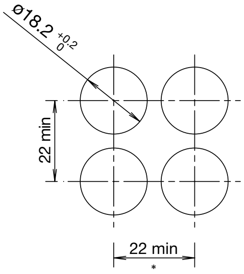
(SPDT contacts on the right only)

3PDT Contacts


TOP
32
22
12
34
24
14
31
21
11

Mounting Hole Layout

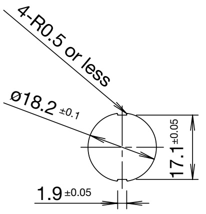
Round (LB6T)


ø18.2 +0.2 0
22 min
22 min
*

*: 23.2 mm minimum for 3PDT
Note: When using terminal cover, see dimensions on page 58.

Panel Cut-out for Positioning

Round (LB6T)


4-R0.5 or less
ø18.2 ±0.1
17.1 ±0.05
1.9 ±0.05

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Illuminated Pushbutton
Pilot Light
Pushbutton
Selector
Illuminated Selector
Key Selector
Lever Switch
Buzzer
Accessories
Maintenance Parts
Panel Cut-out
Instructions

Flush Silhouette Switches LB Series Buzzers

Buzzers

Specifications

Rated Insulation Voltage	30V
Rated Operating Voltage	12, 24V DC
Operating Voltage Range	12V DC±10%, 24V DC±10%
Current Draw	26 mA
Inrush Current	80 mA maximum
Sound Pressure (at 0.1m)	Steady sound: 80 dB minimum (at the rated voltage)
Sound Frequency	2.3±0.3kHz
Response Speed	50 ms maximum
Operating Temperature	–25 to +60°C (no freezing)
Storage Temperature	–30 to +80°C(no freezing)
Operating Humidity	45 to 85% (no condensation)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Dielectric Strength	Between live and dead parts: 1,000V AC, 1 minute
Vibration Resistance	Operating extremes/Damage limits: 5 to 55 Hz, amplitude 0.5 mm
Shock Resistance	Operating extremes: 100m/s² Damage limits:1,000m/s²
Life	1,000 hours minimum (beep sound)
Degree of Protection	IP54 (IEC60529)
Terminal Style	Solder/tab terminal #110 PC board terminal
Weight (approx.)	13g (round), 14g (square)

Standards

Safety Standards	Mark	File No. or Organization
UL60947-1 UL60947-4-1A		UL Recognition File No.E68961
CSA C22.2 No.14		CSA File No.LR21451
EN60947-5-1 EN61000-6-4	CE	EMC Directive

- UL, CSA ratngs: Operating voltage 12, 24V DC.

Package Quantity: 1

Part No. / Shape

Round / Black Bezel

Rectangular / Black Bezel

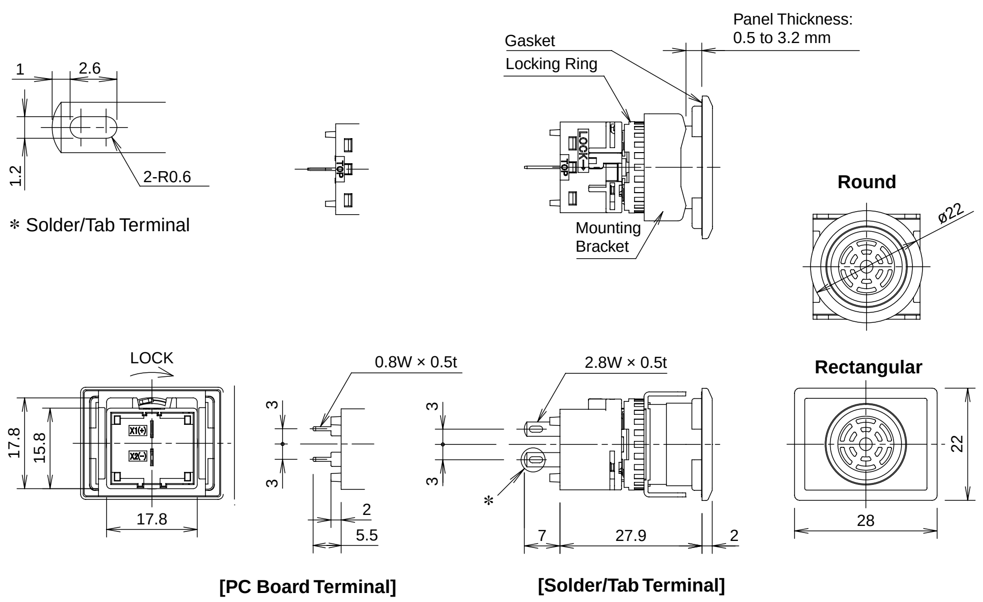
Round / Metallic Bezel

Rectangular / Metallic Bezel

Shape		Operating Voltage	Degree of Protection	Part No.	
				Terminal Style	
				Solder/tab terminal	PC board terminal
Black bezel	Round	24V DC	IP54	**LB6Z-1T04**	**LB6Z-1T04V**
	Rectangular	24V DC	IP54	**LB8Z-1T04**	**LB8Z-1T04V**
Metallic bezel	Round	24V DC	IP54	**LB6MZ-1T04**	**LB6MZ-1T04V**
	Rectangular	24V DC	IP54	**LB8MZ-1T04**	**LB8MZ-1T04V**

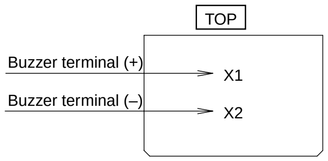
- 12V DC operating voltages also available. Specify "**-1T04**" in place of "**-1T03**" in the Part No.
  Example: **LB6Z-1T03**

Dimensions


1
2.6
1.2
2-R0.6
* Solder/Tab Terminal
Gasket
Locking Ring
Panel Thickness: 0.5 to 3.2 mm
Mounting Bracket
Round
ø22
LOCK
17.8
15.8
17.8
0.8W × 0.5t
3
3
2
5.5
2.8W × 0.5t
3
3
*
7
27.9
2
Rectangular
22
28
[PC Board Terminal]
[Solder/Tab Terminal]

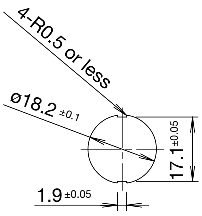
All dimensions in mm.

Terminal Arrangement (Bottom View)


TOP
Buzzer terminal (+)
X1
Buzzer terminal (–)
X2

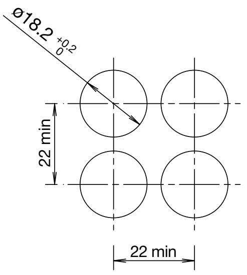
Panel Cut-out for Positioning

Round (LB6Z/LB6MZ)

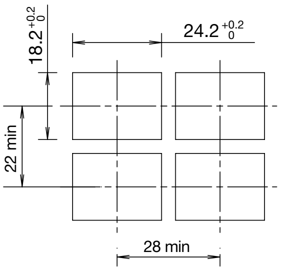

4-R0.5 or less
ø18.2 ±0.1
17.1 ±0.05
1.9 ±0.05

Mounting Hole Layout

Round (LB6Z/LB6MZ)


ø18.2 +0.2 0
22 min
22 min

Rectangular (LB8Z/LB8MZ)


18.2 +0.2 0
24.2 +0.2 0
22 min
28 min

Note: When using rubber boot or terminal cover, see dimensions on page 57 and 58.

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Flush Silhouette Switches LBW Series Illuminated Pushbuttons

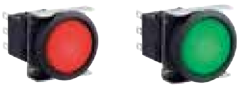
Illuminated Pushbuttons

Solder/Tab Terminal **Package Quantity:1**

Part No. / Shape

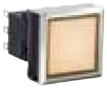
LBW①L-②③T④⑤⑥∗

Flush


Round / Black Bezel

Square / Black Bezel

Round / Metallic Bezel


Square / Metallic Bezel

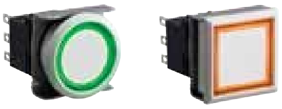
Round with Guard

Square with Guard

Extended

(black bezel is also available)

Flush Ring-illuminated


(black bezel is also available)

① Shape	② Operation	④ Contact	⑤ LED Operating Voltage	Part No.	∗ Illumination Color Code
Black bezel	Momentary	Gold/SPDT	24V AC/DC	**LBW①L-M③T14∗**	Specify the color code in place of ∗ in the Part No. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow
		Gold/DPDT		**LBW①L-M③T24∗**	
	Maintained	Gold/SPDT	24V AC/DC	**LBW①L-A③T14∗**	
		Gold/DPDT		**LBW①L-A③T24∗**	
Metallic bezel	Momentary	Gold/SPDT	24V AC/DC	**LBW①L-M③T14∗**	
		Gold/DPDT		**LBW①L-M③T24∗**	
	Maintained	Gold/SPDT	24V AC/DC	**LBW①L-A③T14∗**	
		Gold/DPDT		**LBW①L-A③T24∗**	
Guard Type	Momentary	Gold/SPDT	24V AC/DC	**LBW①L-M③T14∗**	
		Gold/DPDT		**LBW①L-M③T24∗**	
	Maintained	Gold/SPDT	24V AC/DC	**LBW①L-A③T14∗**	
		Gold/DPDT		**LBW①L-A③T24∗**	

- Flush/Extended color code: A (amber), G (green), PW (pure white), R (red), S (blue), W (white), Y (yellow)
- Ring-illuminated color code: PW (pure white), W (white), WA (amber), WG (green), WR (red), WS (blue)
- Illuminated pushbuttons contain an LED unit. For details on LED units, see page 60.
- The guard opens 180 degrees spring-return.
- Illuminated pushbuttons can be used with legend markings. Engraving can be done on a marking plate which is placed in the lens, or a clear film can be printed and placed in the lens. See page 64 for details on the marking plate and film.
- White lens type (when light is off) are available. Clear lens is used instead of colored lens for amber, green, red, and blue illuminated pushbuttons. Amber, green, red, or blue LED units are used. To specify, see Part Number Development below.
- PC board terminals available for gold contacts. Silver contacts also available. To specify, see Part Number Development below.
- Extended style is available. See Part Number Development below (③).
- Flush ring-illuminated style is available. See Part Number Development below (③). Guard is not available with flush ring-illuminated style.
- 5V DC and 12V AC/DC LED operating voltages also available.
- Other bezel sizes available (LB series). For details, see page 8.

Part Number Development

LBW①L-②③T④⑤⑥∗

① Shape

Code	Shape
6	Round / Black Bezel
7	Square / Black Bezel
6M	Round / Metallic Bezel
7M	Square / Metallic Bezel
6G	Round with Guard
7G	Square with Guard

② Operation

Code	Operation
A	Maintained
M	Momentary

③

Code	Operator Style
1	Flush
2	Extended
1R	Flush Ring-illuminated

④ Contacts

Code	Contact
1	Gold/SPDT
2	Gold/DPDT
5	Silver/SPDT
6	Silver/DPDT

⑤ LED Operating Voltage

Code	Rated Operating Voltage
1	5V DC
3	12V AC/DC
4	24V AC/DC

⑥ Others

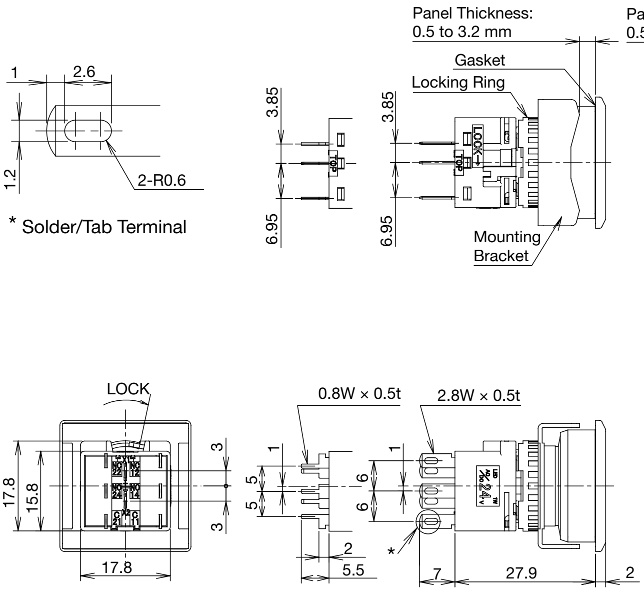
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
W	White Lens Type (When Light is Off)	LBW6L-M1T14W∗
V	PC Board Terminal (Gold Contact Only)	LBW6L-M1T14V∗
VW	White Lens Type (When Light is Off) with PC Board Terminal (Gold Contact Only)	LBW6L-M1T14VW∗

- Specify the color code in place of ∗ in the table above.
- Color code for white lens type (when light is off) : A (amber), G (green), R (red), S (blue)

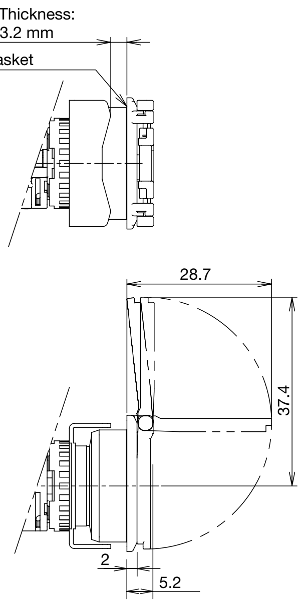
Flush Silhouette LB Series
Flush Silhouette LBW Series
ø16 LB Series
UP Series
Illuminated Pushbutton
Pilot Light
Pushbutton
Selector
Illuminated Selector
Key Switch
Lever Switch
Buzzer
Accessories
Maintenance Parts
Panel Cut-out
Instructions

Dimensions

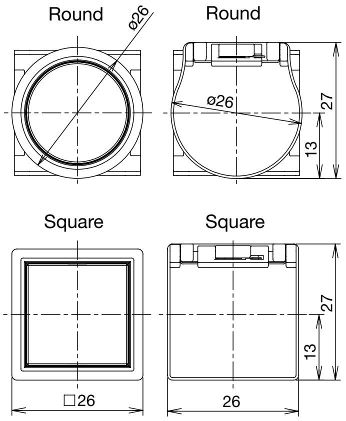
Flush/Ring-illuminated


1
2.6
1.2
2-R0.6
* Solder/Tab Terminal
3.85
6.95
Panel Thickness: 0.5 to 3.2 mm
Gasket
Locking Ring
Mounting Bracket
LOCK
17.8
15.8
3
3
17.8
0.8W × 0.5t
2.8W × 0.5t
1
5
5
6
6
2
5.5
*
7
27.9
2

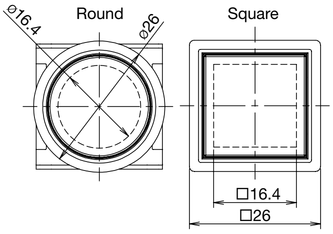
[PC Board Terminal] [Solder/Tab Terminal]


Panel Thickness: 0.5 to 3.2 mm
Gasket
28.7
37.4
2
5.2

[With Guard]


Round
ø26
Round
ø26
27
13
Square
Square
□26
26
27
13

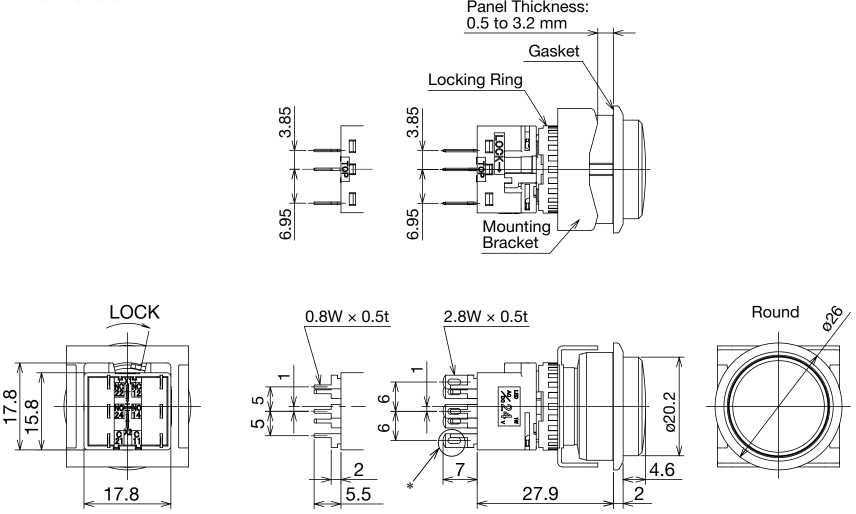
[With Guard]


ø16.4
Round
ø26
Square
□16.4
□26

Ring-illuminated

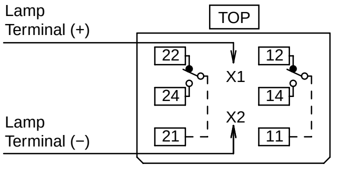
Extended

All dimensions in mm.


Panel Thickness: 0.5 to 3.2 mm
Gasket
Locking Ring
3.85
6.95
Mounting Bracket
LOCK
17.8
15.8
17.8
0.8W × 0.5t
2.8W × 0.5t
1
5
5
6
6
2
5.5
*
7
27.9
ø20.2
4.6
2
Round
ø26

[PC Board Terminal] [Solder/Tab Terminal]

Terminal Arrangement (Bottom View)

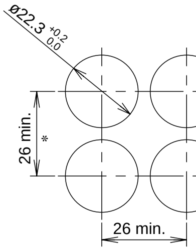

Lamp Terminal (+)
TOP
22
12
X1
24
14
X2
Lamp Terminal (−)
21
11

(SPDT contacts on the right only)

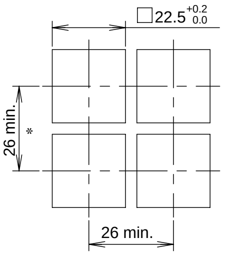
- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Mounting Hole Layout

Round (LBW6/LBW6M)


ø22.3 +0.2 0.0
26 min.
*
26 min.

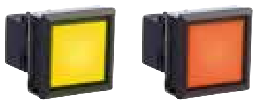
Square (LBW7/LBW7M)


□22.5 +0.2 0.0
26 min.
*
26 min.

∗: 53 mm minimum for switches with guard.

Pilot Lights

Solder/Tab Terminal Package Quantity:1

Part No. / Shape	**LBW①P-1T0②③∗**
	Round / Black Bezel  Square / Black Bezel Round / Metallic Bezel Square / Metallic Bezel

① Shape	③ LED Operating Voltage	Part No.	∗ Illumination Color Code
Black Bezel	24V AC/DC	**LBW①P-1T04∗**	Specify the color code in place of ∗ in the Part No. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow
Metallic Bezel	24V AC/DC	**LBW①P-1T04∗**	

- Pilot lights contain an LED unit. For maintenance LED units see page 60.
- Legends and symbols can be engraved on a marking plate or film to be inserted under the lens by users for labelling purposes. See page 64 for details.
- White lens type (when light is off) are available. Clear lens is used instead of colored lens for amber, green, red, and blue pilot lights. Amber, green, red, or blue LED units are used. To specify, see Part Number Development below.
- PC board terminals available. To specify, see Part Number Development below.
- 5V DC and 12V AC/DC LED operating voltages also available.
- Other bezel sizes available (LBW series). For details, see page 10.

Part Number Development

LBW①P-1T0②③∗

① Shape

Code	Shape
6	Round / Black Bezel
7	Square / Black Bezel
6M	Round / Metallic Bezel
7M	Square / Metallic Bezel

④ LED Operating Voltage

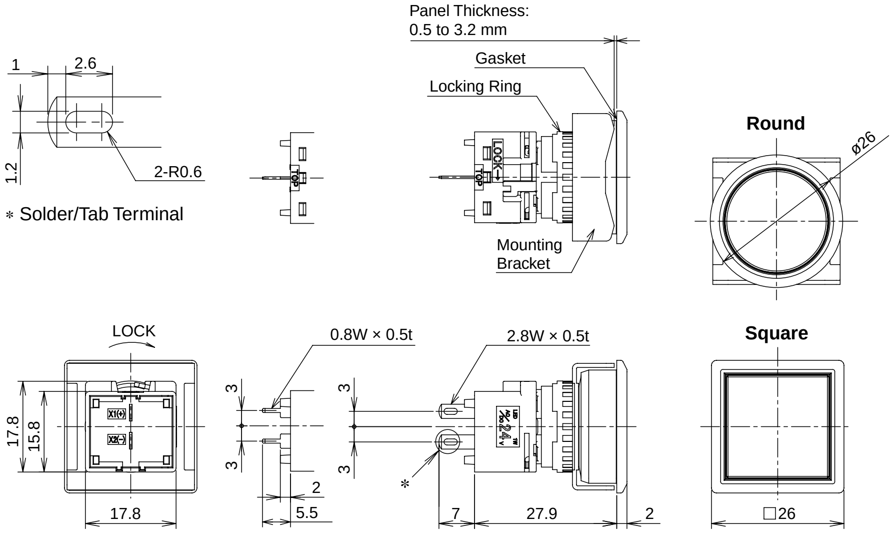
Code	Rated Operating Voltage
1	5V DC
3	12V AC/DC
4	24V AC/DC

⑤ Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
W	White Lens Type (When Light is Off)	LBW6P-1T04W∗
V	PC Board Terminal	LBW6P-1T04V∗
VW	White Lens Type (When light is Off) with PC Board Terminal	LBW6P-1T04VW∗

- Specify the color code in place of ∗ in the table above.
- Color code for white lens type: A (amber), G (green), R (red), and S (blue) only.

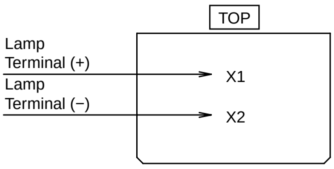
Dimensions


1
2.6
1.2
2-R0.6
∗ Solder/Tab Terminal
Panel Thickness:
0.5 to 3.2 mm
Gasket
Locking Ring
Mounting
Bracket
Round
ø26
LOCK
17.8
15.8
17.8
0.8W × 0.5t
3
3
2
5.5
2.8W × 0.5t
3
3
∗
7
27.9
2
Square
□26

[PC Board Terminal] **[Solder/Tab Terminal]**

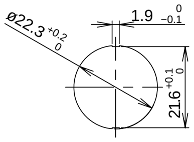
All dimensions in mm.

Terminal Arrangement (Bottom View)


TOP
Lamp
Terminal (+)
Lamp
Terminal (−)
X1
X2

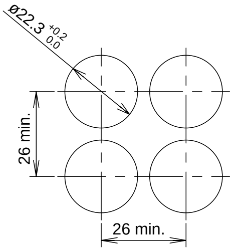
Panel Cut-out for Positioning

Round (LBW6P/LBW6MP)

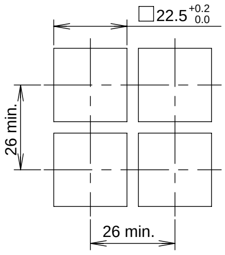

ø22.3 +0.2 0
1.9 0 −0.1
21.6 +0.1 0

Mounting Hole Layout

Round (LBW6P/LBW6MP)


ø22.3 +0.2 0.0
26 min.
26 min.

Square (LBW7P/LBW7MP)


□22.5 +0.2 0.0
26 min.
26 min.

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Flush Silhouette Switches LBW Series Pushbuttons

Pushbuttons

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape

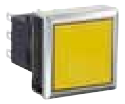
LBW①B-②1T③④∗

Flush

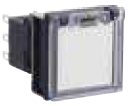
Round / Black Bezel

Square / Black Bezel

Round / Metallic Bezel


Square / Metallic Bezel

Round with Guard


Square with Guard

Extended

Round only
(metallic bezel available)

① Shape	Button Style	② Operation	③ Contact	Part No.		∗ Illumination Color Code
				Gold Contact	Silver Contact	
Black bezel	Button	Momentary	SPDT	**LBW①B-M1T1∗**	**LBW①B-M1T5∗**	Specify the color code in place of ∗ in the Part No. B: black G: green R: red S: blue W: white Y: yellow
			DPDT	**LBW①B-M1T2∗**	**LBW①B-M1T6∗**	
			3PDT	**LBW①B-M1T3∗**	**LBW①B-M1T7∗**	
		Maintained	SPDT	**LBW①B-A1T1∗**	**LBW①B-A1T5∗**	
			DPDT	**LBW①B-A1T2∗**	**LBW①B-A1T6∗**	
			3PDT	**LBW①B-A1T3∗**	**LBW①B-A1T7∗**	
Metallic bezel	Button	Momentary	SPDT	**LBW①B-M1T1∗**	**LBW①B-M1T5∗**	
			DPDT	**LBW①B-M1T2∗**	**LBW①B-M1T6∗**	
			3PDT	**LBW①B-M1T3∗**	**LBW①B-M1T7∗**	
		Maintained	SPDT	**LBW①B-A1T1∗**	**LBW①B-A1T5∗**	
			DPDT	**LBW①B-A1T2∗**	**LBW①B-A1T6∗**	
			3PDT	**LBW①B-A1T3∗**	**LBW①B-A1T7∗**	
Guard Type	Button	Momentary	SPDT	**LBW①B-M1T1∗**	**LBW①B-M1T5∗**	
			DPDT	**LBW①B-M1T2∗**	**LBW①B-M1T6∗**	
			3PDT	**LBW①B-M1T3∗**	**LBW①B-M1T6∗**	
		Maintained	SPDT	**LBW①B-A1T1∗**	**LBW①B-A1T5∗**	
			DPDT	**LBW①B-A1T2∗**	**LBW①B-A1T6∗**	
			3PDT	**LBW①B-A1T3∗**	**LBW①B-A1T7∗**	

- The guard opens 180 degrees spring-return.
- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- Pushbuttons can be used with legend markings engraved on marking plates and lens buttons with clear film inserted in the lens is available. To specify, see Part Number Development below. See page 63 for details on the marking plate and film.
- Extended pushbuttons available. To specify, see Part Number Development below. Pushbuttons with guard is not available. Only momentary operation available for square extended pushbuttons.
- Other bezel sizes available (LB series). For details, see page 12.

Part Number Development

LBW①B-②③1T④⑤∗

① Shape

Code	Shape
6	Round / Black Bezel
7	Square / Black Bezel
6M	Round / Metallic Bezel
7M	Square / Metallic Bezel
6G	Round with Guard
7G	Square with Guard

② Operation

Code	Operation
A	Maintained
M	Momentary

③ Operator Style

Code	Operation
1	Flush
2	Extended

- Extended has round (black/metallic bezel) and momentary only. Guard model is not available.

④ Contacts

Code	Contact	Code	Contact
1	Gold/SPDT	5	Silver/SPDT
2	Gold/DPDT	6	Silver/DPDT
3	Gold/3PDT	7	Silver/3PDT

⑤ Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
L (Note 1)	Lens	LBW6B-M1T1L∗
V	PC Board Terminal (Gold Contact Only)	LB6WB-M1T1V∗
VL (Note 1)	PC Board Terminal with Lens (Gold Contact Only)	LB6WB-M1T1VL∗

Note 1: Codes L and VL are available with flush operator only.

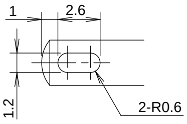
- Color code (∗) for lens:
  A (amber), B (translucent lens with black nameplate), G (green), R (red), S (blue), W (white), Y (yellow)

Flush Silhouette LB Series
Flush Silhouette LBW Series
ø16 LB Series
UP Series
Illuminated Pushbutton
Pilot Light
Pushbutton
Selector
Illuminated Selector
Key Selector
Lever Switch
Buzzer
Accessories
Maintenance Parts
Panel Cut-out
Instructions

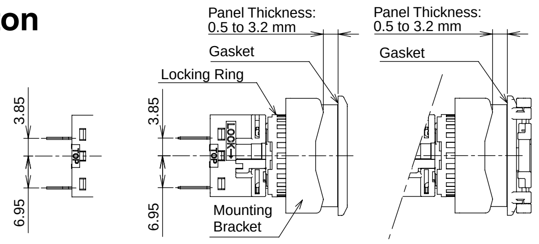
Dimensions

Flush Pushbutton

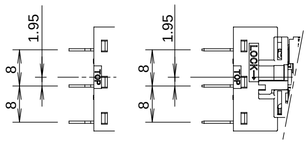
All dimensions in mm.



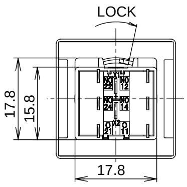
∗ Solder/Tab Terminal


Panel Thickness: 0.5 to 3.2 mm
Panel Thickness: 0.5 to 3.2 mm
Gasket
Gasket
Locking Ring
3.85
6.95
3.85
6.95
Mounting Bracket
LOCK

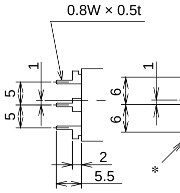
[SPDT/DPDT]


1.95
8
8
1.95
8
8
LOCK

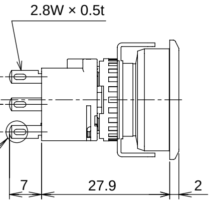
[3PDT]


LOCK
17.8
15.8
17.8

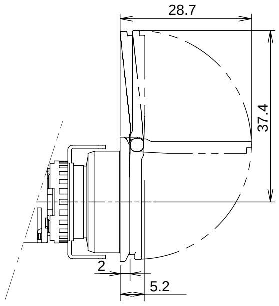
[SPDT/DPDT]


0.8W × 0.5t
1
5
5
2
5.5

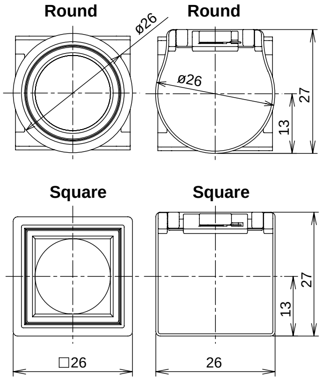
[PC Board Terminal]


2.8W × 0.5t
1
6
6
*
7
27.9
2

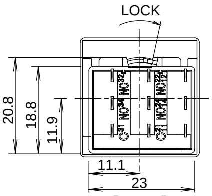
[Solder/Tab Terminal]



[With Guard]

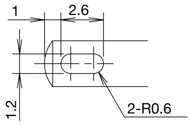

Round
ø26
Round
ø26
13
27
Square
Square
□26
26
13
27

[With Guard]

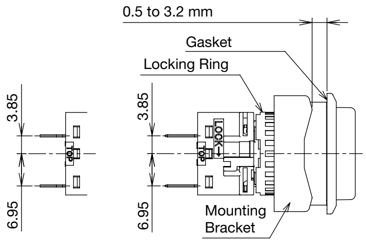

LOCK
20.8
18.8
11.9
11.1
23

[3PDT]

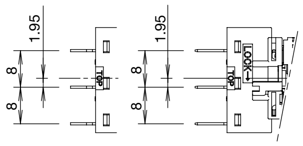
Extended Pushbutton



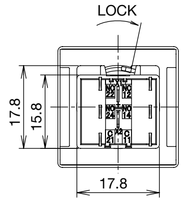
* Solder/Tab Terminal


Panel Thickness: 0.5 to 3.2 mm
Gasket
Locking Ring
3.85
6.95
3.85
6.95
Mounting Bracket
LOCK

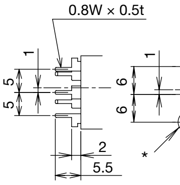
[SPDT/DPDT]


1.95
8
8
1.95
8
8
LOCK

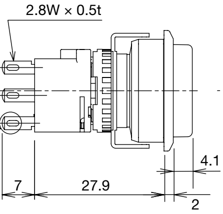
[3PDT]


LOCK
17.8
15.8
17.8

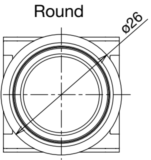
[SPDT/DPDT]

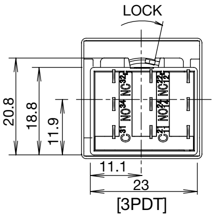

0.8W × 0.5t
1
5
5
2
5.5

[PC Board Terminal]


2.8W × 0.5t
1
6
6
*
4.1
7
27.9
2

[Solder/Tab Terminal]

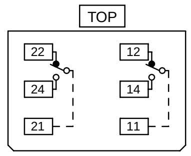



LOCK
20.8
18.8
11.9
11.1
23

[3PDT]

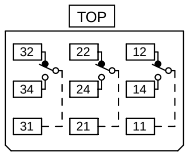
Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts


TOP
22
12
24
14
21
11

(SPDT contacts on the right only)

3PDT Contacts


TOP
32
22
12
34
24
14
31
21
11

- For details on mounting hole layout, see page 49.
- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Flush Silhouette Switches LBW Series Selector Switches

Selector Switches

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape

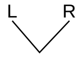
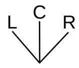
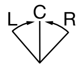
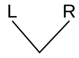
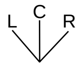
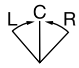
LBW①S-②T③④

Round / Black Bezel

Square / Black Bezel

Round / Metallic Bezel

Square / Metallic Bezel

① Shape	② Operator Position		③ Contact	Part No.	
				Gold Contact	Silver Contact
Black bezel	90° 2-position	Maintained 	SPDT	**LBW①S-2T1**	**LBW①S-2T5**
			DPDT	**LBW①S-2T2**	**LBW①S-2T6**
			3PDT	**LBW①S-2T3**	**LBW①S-2T7**
	45° 3-position	Maintained 	DPDT	**LBW①S-3T2**	**LBW①S-3T6**
			3PDT	**LBW①S-3T3**	**LBW①S-3T7**
		Spring return two-way 	DPDT	**LBW①S-33T2**	**LBW①S-33T6**
			3PDT	**LBW①S-33T3**	**LBW①S-33T7**
Metallic bezel	90° 2-position	Maintained 	SPDT	**LBW①S-2T1**	**LBW①S-2T5**
			DPDT	**LBW①S-2T2**	**LBW①S-2T6**
			3PDT	**LBW①S-2T3**	**LBW①S-2T7**
	45° 3-position	Maintained 	DPDT	**LBW①S-3T2**	**LBW①S-3T6**
			3PDT	**LBW①S-3T3**	**LBW①S-3T7**
		Spring return two-way 	DPDT	**LBW①S-33T2**	**LBW①S-33T6**
			DPDT	**LBW①S-33T3**	**LBW①S-33T7**

- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- For contact operation, see page 48.
- Other bezel sizes available (LB series). For details, see page 14.

Part Number Development

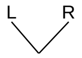
LBW①S-②T③④

① Shape

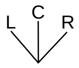
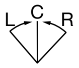
Code	Shape
6	Round / Black Bezel
7	Square / Black Bezel
6M	Round / Metallic Bezel
7M	Square / Metallic Bezel

② Operator Position

2-position

Operator Position
2 Maintained 

3-position

Operator Position	
3 Maintained 	**33** Spring return two-way 

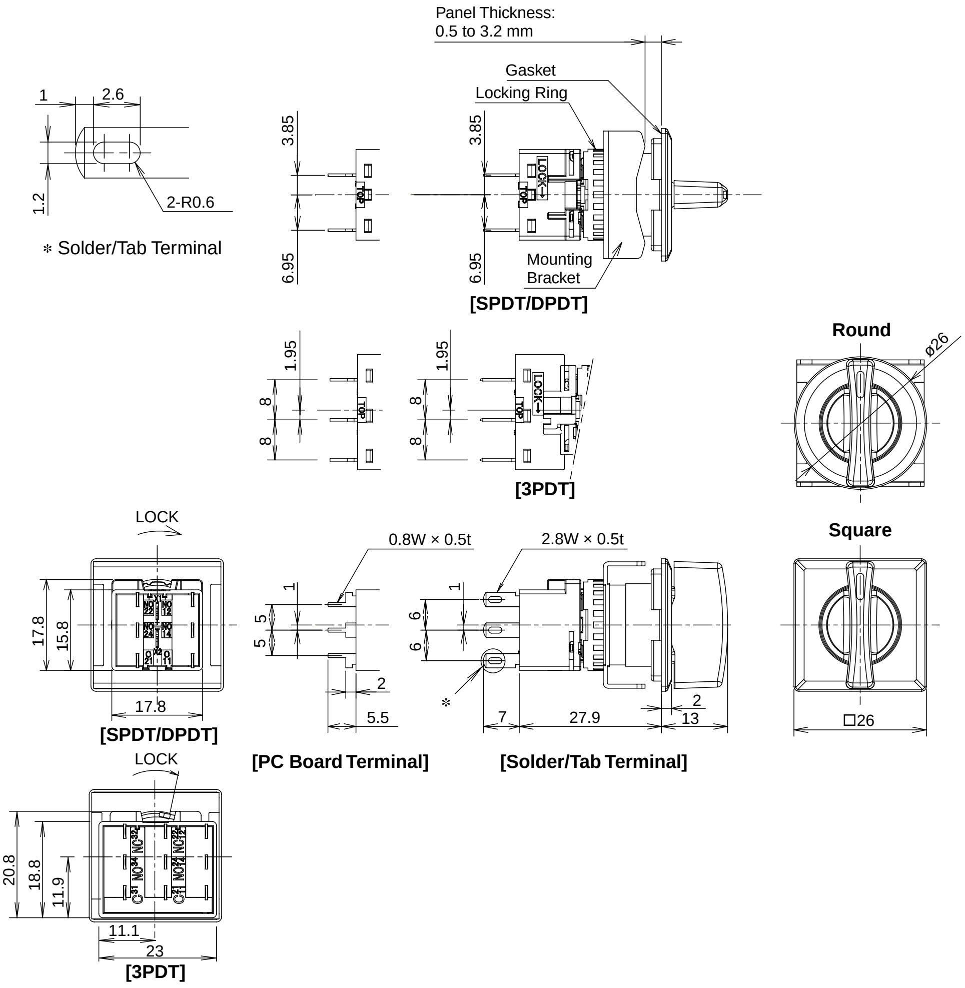
③ Contacts

Code	Contact
1	Gold/SPDT (90° 2-position only)
2	Gold/DPDT
3	Gold/3PDT
5	Silver/SPDT (90° 2-position only)
6	Silver/DPDT
7	Silver/3PDT

④ Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
V	PC Board Terminal (Gold Contact Only)	LBW6S-2T1V

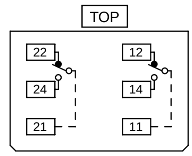
Dimensions


Panel Thickness:
0.5 to 3.2 mm
Gasket
Locking Ring
1
2.6
1.2
2-R0.6
＊ Solder/Tab Terminal
3.85
6.95
3.85
6.95
LOCK
TOP
Mounting Bracket
[SPDT/DPDT]
1.95
8
8
1.95
8
8
[3PDT]
Round
ø26
LOCK
17.8
15.8
17.8
[SPDT/DPDT]
0.8W × 0.5t
1
5
5
2
5.5
2.8W × 0.5t
1
6
6
＊
7
27.9
2
13
[PC Board Terminal]
[Solder/Tab Terminal]
Square
□26
LOCK
20.8
18.8
11.9
11.1
23
[3PDT]

All dimensions in mm.

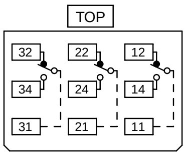
Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts


TOP
22
12
24
14
21
11

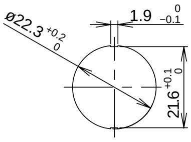
(SPDT contacts on the right only)

3PDT Contacts


TOP
32
22
12
34
24
14
31
21
11

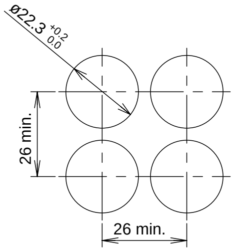
Panel Cut-out for Positioning

Round (LBW6S/LBW6MS)

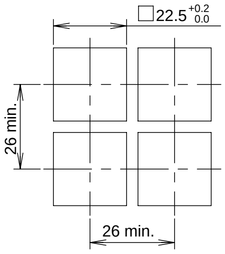

ø22.3 +0.2 0
1.9 0 −0.1
21.6 +0.1 0

Mounting Hole Layout

Round (LBW6S/LBW6MS)


ø22.3 +0.2 0.0
26 min.
26 min.

Square (LBW7S/LBW7MS)


□22.5 +0.2 0.0
26 min.
26 min.

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Flush Silhouette Switches LBW Series Key Selector Switches

Key Selector Switches

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape

LBW①K-②③T④⑤-⑥

Wave Key

Round / Black Bezel

Square / Black Bezel

Round / Metallic Bezel

Square / Metallic Bezel

Disc Tumbler Key

Round /Metallic Bezel

Square / Metallic Bezel

① Shape	② Operator Position		⑤ Key Removable Position	⑤ Contact	Part No.	
					Gold Contact	Silver Contact
Black bezel	90° 2-position	Maintained	A: Key removable in all positions Ⓛ Ⓡ	SPDT	**LBW①K-2ST1A**	**LBW①K-2ST5A**
				DPDT	**LBW①K-2ST2A**	**LBW①K-2ST6A**
				3PDT	**LBW①K-2ST3A**	**LBW①K-2ST7A**
	45° 3-position	Maintained	A: Key removable in all positions Ⓛ Ⓒ Ⓡ	DPDT	**LBW①K-3ST2A**	**LBW①K-3ST6A**
				3PDT	**LBW①K-3ST3A**	**LBW①K-3ST7A**
Metallic bezel	90° 2-position	Maintained	A: Key removable in all positions Ⓛ Ⓡ	SPDT	**LBW①K-2ST1A**	**LBW①K-2ST5A**
				DPDT	**LBW①K-2ST2A**	**LBW①K-2ST6A**
				3PDT	**LBW①K-2ST3A**	**LBW①K-2ST7A**
	45° 3-position	Maintained	A: Key removable in all positions Ⓛ Ⓒ Ⓡ	DPDT	**LBW①K-3ST2A**	**LBW①K-3ST6A**
				3PDT	**LBW①K-3ST3A**	**LBW①K-3ST7A**

- For operator position, see Part Number Development below.
- For key removable position. see Part Number Development below. The key cannot be removed at the return position.
- Two keys are supplied.
- Besides the standard key (key number 0H), six other keys are available.
- Disc tumbler keys also available. Only the standard key is available. To specify, see Part Number Development below.
- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- For contact operation, see page 48.
- Other bezel sizes available (LB series). For details, see page 18.

Part Number Development

LBW①K-②③T④⑤-⑥

① Shape

Code	Shape
6	Round / Black Bezel
7	Square / Black Bezel
6M	Round / Metallic Bezel
7M	Square / Metallic Bezel

② Operator Position

Code	Operator Position
2	90° 2-position maintained
3	45° 3-position maintained
33	45°-3-position spring return two-way

③ Key Style

Code	Key Style
S	Wave key
Blank	Disc tumbler key

④ Contacts

Code	Contact
1	Gold/SPDT (90° 2-position only)
2	Gold/DPDT
3	Gold/3PDT
5	Silver/SPDT (90° 2-position only)
6	Silver/DPDT
7	Silver/3PDT

⑤ Key Removal Position

The key cannot be removed at the return position.

2-position

Key Removable Position	
A:Key removable in all positions Ⓛ Ⓡ	**B**:Key removable at left Ⓛ 🅡

3-position

Key Removable Position	
A:Key removable in all positions Ⓛ Ⓒ Ⓡ	**D**:Key removable at center 🅛 Ⓒ 🅡

3-position

Spring return two-way
🅛 C 🅡

- Key is removable at Ⓛ, Ⓒ, Ⓡ. Key is retained at 🅛, 🅒, and 🅡.

⑥ Key Number

Code	
0H	Standard key
1H to 2H	Reversible key
3H to 6H	Non-reversible key

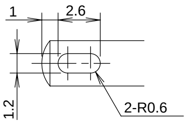
- Wave keys only.

Others

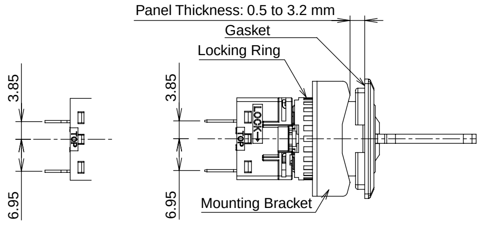
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
V	PC Board Terminal (Gold Contact Only)	LBW6K-2T1VA

Dimensions

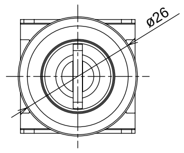
Key Selector Switches with Wave Key

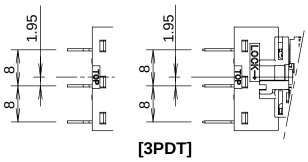


∗ Solder/Tab Terminal

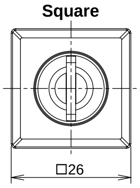

Panel Thickness: 0.5 to 3.2 mm
Gasket
Locking Ring
3.85
6.95
3.85
6.95
Mounting Bracket

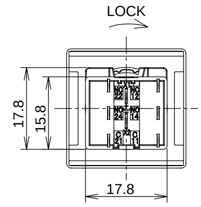
[SPDT/DPDT]



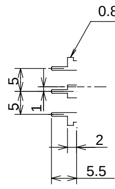

1.95
8
8
1.95
8
8

[3PDT]

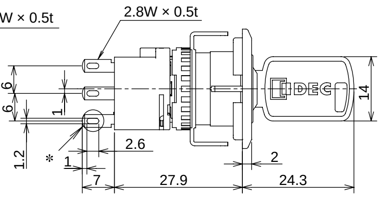



LOCK
17.8
15.8
17.8

[SPDT/DPDT]

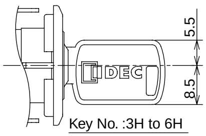

0.8W × 0.5t
5
5
1
2
5.5

[PC Board Terminal]

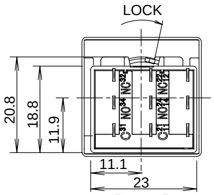

2.8W × 0.5t
6
6
1
1.2
∗
1
2.6
7
27.9
2
24.3
14
IDEC

[Solder/Tab Terminal]

Key No. :N/A to 2H

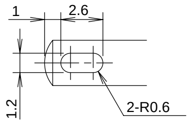


Key No. :3H to 6H

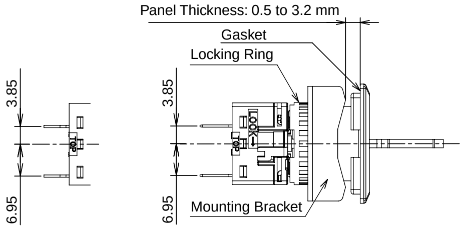

LOCK
20.8
18.8
11.9
11.1
23

[3PDT]

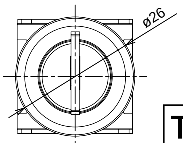
Key Selector Switches with Disc Tumbler Key

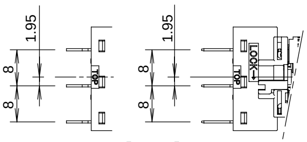


∗ Solder/Tab Terminal

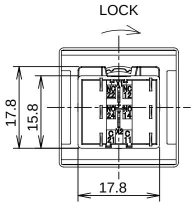

Panel Thickness: 0.5 to 3.2 mm
Gasket
Locking Ring
3.85
6.95
3.85
6.95
Mounting Bracket

[SPDT/DPDT]

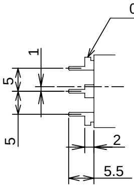



1.95
8
8
1.95
8
8

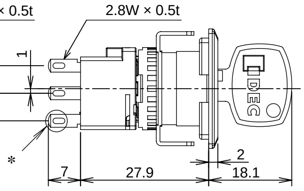
[3PDT]


LOCK
17.8
15.8
17.8

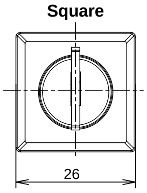
[SPDT/DPDT]

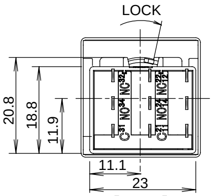

0.8W × 0.5t
1
5
5
2
5.5

[PC Board Terminal]


2.8W × 0.5t
1
6
6
∗
7
27.9
2
18.1
IDEC

[Solder/Tab Terminal]

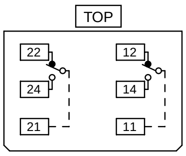



LOCK
20.8
18.8
11.9
11.1
23

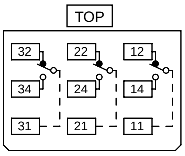
[3PDT]

Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts **3PDT Contacts**


TOP
22
24
21
12
14
11

(SPDT contacts on the right only)


TOP
32
34
31
22
24
21
12
14
11

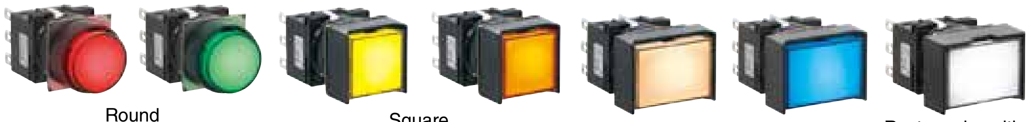
- For details on mounting hole layout, see page 49.
- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Illuminated Pushbuttons

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape	**LB①L-②1T③④⑤∗**



Round Square Rectangular Rectangular with 3-sided Barrier

② Operation	③ Contact	④ LED Operating Voltage	Part No.		∗ Illumination Color Code
			Gold Contact	Silver Contact	
Momentary	SPDT	24V AC/DC	**LB①L-M1T14∗**	**LB①L-M1T54∗**	Specify the color code in place of ∗ in the Part No. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow
	DPDT		**LB①L-M1T24∗**	**LB①L-M1T64∗**	
Maintained	SPDT	24V AC/DC	**LB①L-A1T14∗**	**LB①L-A1T54∗**	
	DPDT		**LB①L-A1T24∗**	**LB①L-A1T64∗**	

- Illuminated pushbuttons contain an LED unit. For details on LED units, see page 60.
- Illuminated pushbuttons can be used with legend markings. Engraving can be done on a marking plate which is placed in the lens, or a clear film can be printed and placed in the lens. See page 63 for details on the marking plate and film.
- White lens type (when light is off) are available. Clear lens is used instead of colored lens for amber, green, red, and blue illuminated pushbuttons. Amber, green, red, or blue LED units are used. To specify, see Part Number Development below.
- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- 5V DC and 12V AC/DC LED operating voltages also available. To specify, see Part Number Development below.

Part Number Development

LB①L-②1T③④⑤∗

① Shape

Code	Shape
1	Round
2	Square
3	Rectangular
4	Rectangular with 3-sided Barrier

② Operation

Code	Operation
A	Maintained
M	Momentary

③ Contacts

Code	Contact
1	Gold/SPDT
2	Gold/DPDT
5	Silver/SPDT
6	Silver/DPDT

④ LED Operating Voltage

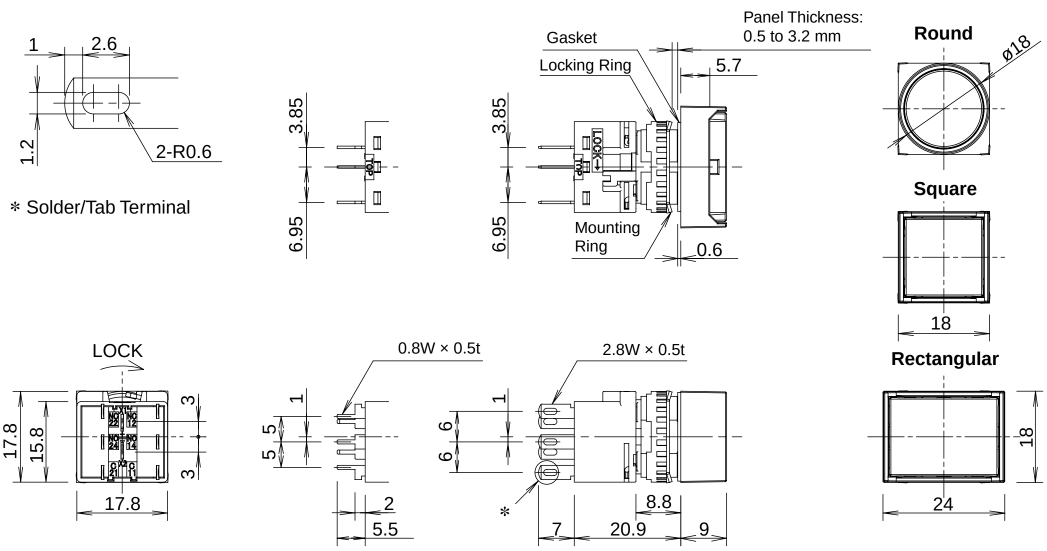
Code	Rated Operating Voltage
1	5V DC
3	12V AC/DC
4	24V AC/DC

⑤ Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
W	White Lens Type (When Light is Off)	LB1L-M1T14W∗
V	PC Board Terminal (Gold Contact Only)	LB1L-M1T14V∗
VW	White Lens Type (When Light is Off) with PC Board Terminal (Gold Contact Only)	LB1L-M1T14VW∗

- Specify the color code in place of ∗ in the table above
- Color code for white lens type: A (amber), G (green), R (red), and S (blue) only.

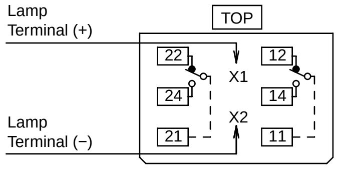
Dimensions


1
2.6
1.2
2-R0.6
* Solder/Tab Terminal
3.85
6.95
3.85
6.95
Gasket
Locking Ring
Panel Thickness:
0.5 to 3.2 mm
5.7
Mounting Ring
0.6
Round
ø18
Square
18
Rectangular
18
24
LOCK
17.8
15.8
3
3
17.8
0.8W × 0.5t
1
5
5
2
5.5
2.8W × 0.5t
1
6
6
*
7
20.9
8.8
9

[PC Board Terminal] **[Solder/Tab Terminal]**

All dimensions in mm.

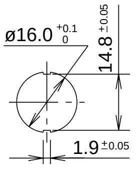
Terminal Arrangement (Bottom View)


Lamp
Terminal (+)
TOP
22
12
X1
24
14
X2
Lamp
Terminal (−)
21
11

(SPDT contacts on the right only)

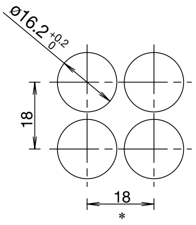
Panel Cut-out for Positioning

(LB1L/LB2L/LB3L/LB4L)


ø16.0 +0.1 0
14.8 ±0.05
1.9 ±0.05

Mounting Hole Layout

(LB1L/LB2L/LB3L/LB4L)


ø16.2 +0.2 0
18
18
*

*: 24 mm for rectangular units.
Note: When using rubber boot or terminal cover, see dimensions on 56 and 58.

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

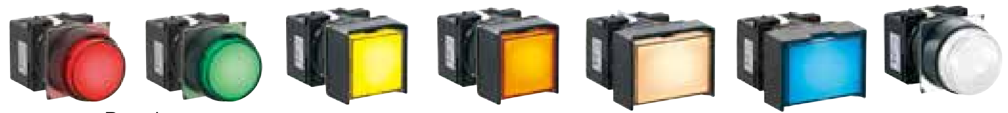
Pilot Lights

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape

LB①P-②T0③④∗



Round

Square

Rectangular

Rectangular with 3-sided Barrier

Dome

② Lens Shape	③ LED Operating Voltage	Part No.	∗ Illumination Color Code
Flush	24V AC/DC	**LB①P-1T04∗**	Specify the color code in place of ∗ in the Part No. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow
Dome	24V AC/DC	**LB1P-2T04∗**	

- Pilot lights contain an LED unit. For maintenance LED units see page 60.
- Legends and symbols can be engraved on a marking plate or film to be inserted under the lens by users for labelling purposes. See page 63 for details.
- White lens type (when light is off) are available. Clear lens is used instead of colored lens for amber, green, red, and blue pilot lights. Amber, green, red, or blue LED units are used. To specify, see Part Number Development below.
- PC board terminals available. To specify, see Part Number Development below.
- 5V DC and 12V AC/DC LED operating voltages also available. To specify, see Part Number Development below.

Part Number Development

LB①P-②T0③④∗

① Shape

Code	Shape
1	Round
2	Square
3	Rectangular
4	Rectangular with 3-sided Barrier

- Round only for dome.

② Lens Shape

Code	Lens Shape
1	Flush
2	Dome

③ LED Operating Voltage

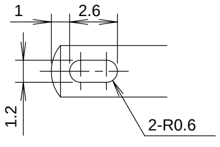
Code	Rated Operating Voltage
1	5V DC
3	12V AC/DC
4	24V AC/DC

⑤ Others

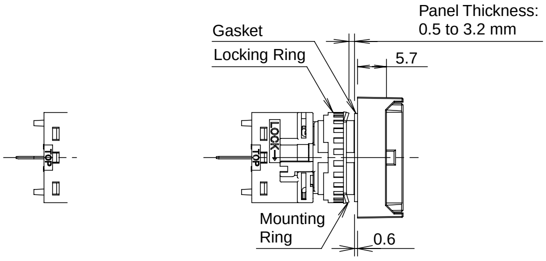
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
W	White Lens Type (When Light is Off)	LB1P-1T04W∗
V	PC Board Terminal	LB1P-1T04V∗
VW	White Lens Type (When light is Off) with PC Board Terminal	LB1P-1T04VW∗

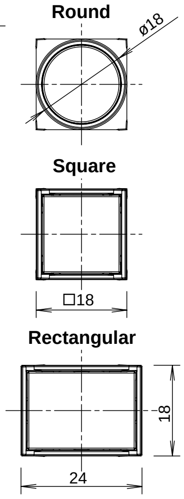
- Specify the color code in place of ∗ in the table above
- Color code for white lens type: A (amber), G (green), R (red), and S (blue) only.

Dimensions

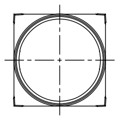


* Solder/Tab Terminal

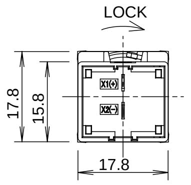

Panel Thickness:
0.5 to 3.2 mm
Gasket
Locking Ring
5.7
LOCK
TOP
Mounting
Ring
0.6

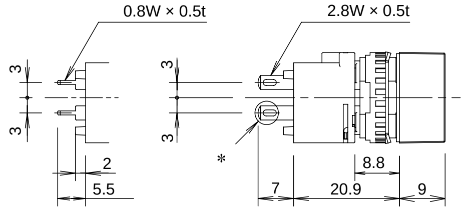

Round
ø18
Square
□18
Rectangular
18
24

[Flush]

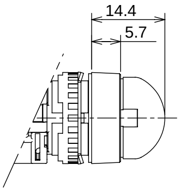


[Dome]


LOCK
17.8
15.8
X1(+)
X2(−)
17.8


0.8W × 0.5t
3
3
2
5.5
2.8W × 0.5t
3
3
*
8.8
7
20.9
9

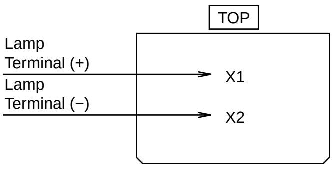
[PC Board Terminal] [Solder/Tab Terminal]



[Dome]

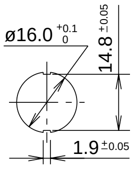
All dimensions in mm.

Terminal Arrangement (Bottom View)


TOP
Lamp
Terminal (+)
Lamp
Terminal (−)
X1
X2

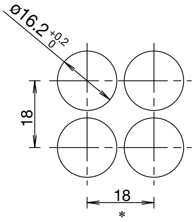
Panel Cut-out for Positioning

(LB1P/LB2P/LB3P/LB4P)


ø16.0 +0.1 0
14.8 ±0.05
1.9 ±0.05

Mounting Hole Layout

(LB1P/LB2P/LB3P/LB4P)


ø16.2 +0.2 0
18
18
*

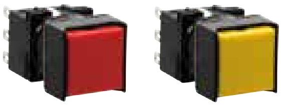
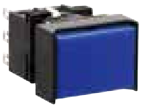
*: 24 mm for rectangular units.
Note: When using rubber boot or terminal cover, see dimensions on 56 and 58.

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Pushbuttons

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape	LB①B-②1T③④*
	Round  Square  Rectangular Rectangular with 3-sided Barrier

Button Style	② Operation	③ Contact	Part No.		* Illumination Color Code
			Gold Contact	Silver Contact	
Button	Momentary	SPDT	**LB①B-M1T1***	**LB①B-M1T5***	B: black G: green R: red S: blue W: white Y: yellow
		DPDT	**LB①B-M1T2***	**LB①B-M1T6***	
		3PDT	**LB①B-M1T3***	**LB①B-M1T7***	
	Maintained	SPDT	**LB①B-A1T1***	**LB①B-A1T5***	
		DPDT	**LB①B-A1T2***	**LB①B-A1T6***	
		3PDT	**LB①B-A1T3***	**LB①B-A1T7***	
Lens	Momentary	SPDT	**LB①B-M1T1L***	**LB①B-M1T5L***	A: amber G: green R: red S: blue W: white Y: yellow
		DPDT	**LB①B-M1T2L***	**LB①B-M1T6L***	
		3PDT	**LB①B-M1T3L***	**LB①B-M1T7L***	
	Maintained	SPDT	**LB①B-A1T1L***	**LB①B-A1T5L***	
		DPDT	**LB①B-A1T2L***	**LB①B-A1T6L***	
		3PDT	**LB①B-A1T3L***	**LB①B-A1T7L***	

- Lens can be used with legend markings. Engraving can be done on a marking plate which is placed in the lens, or a clear film can be printed and placed in the lens. See page 63 for details on the marking plate and film.
- Black is available for lens. Black lens consists of a transparent lens and a black marking plate. To specify, see Part Number Development below.
- PC board terminals available for gold contacts. To specify, see Part Number Development below.

Part Number Development

LB①B-②1T③④*

① Shape

Code	Shape
1	Round
2	Square
3	Rectangular
4	Rectangular with 3-sided Barrier

② Operation

Code	Operation
A	Maintained
M	Momentary

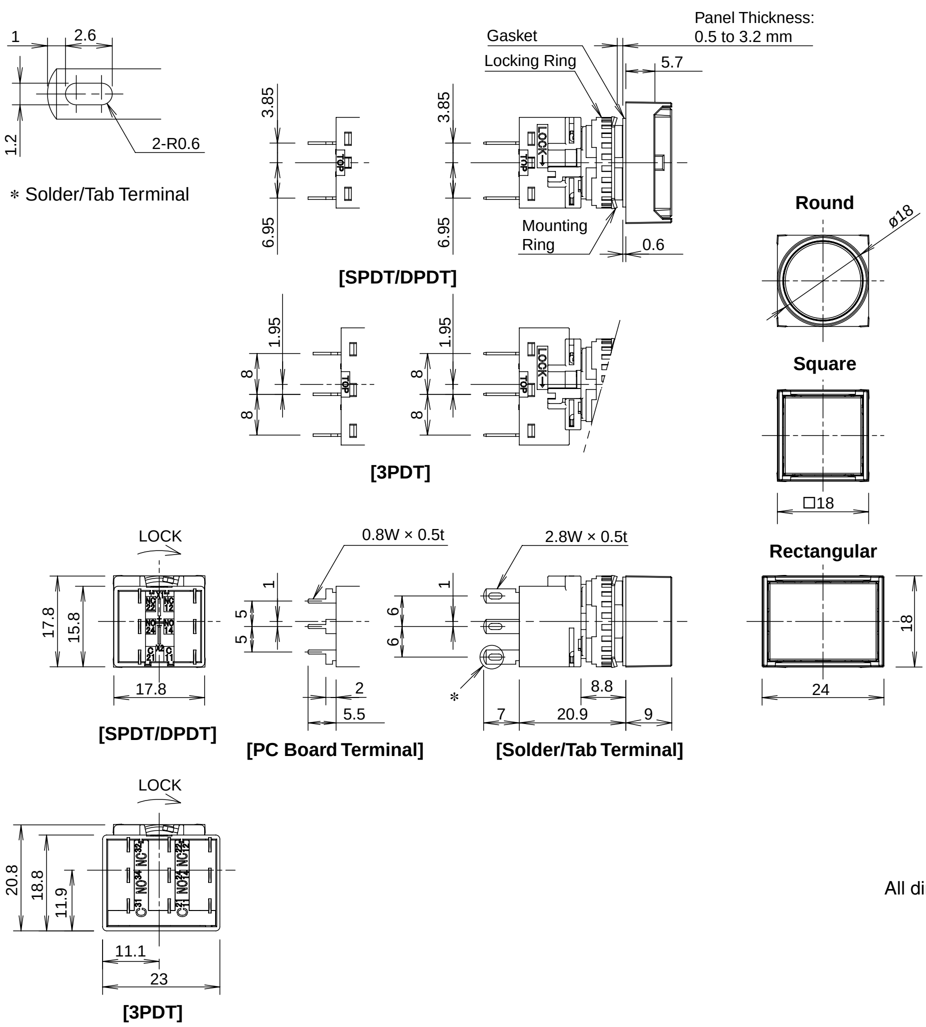
③ Contacts

Code	Contact
1	Gold/SPDT
2	Gold/DPDT
3	Gold/3PDT
5	Silver/SPDT
6	Silver/DPDT
7	Silver/3PDT

④ Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
B	Black Translucent Lens (Lens Only)	LB1B-M1T1LB
V	PC Board Terminal (Gold Contact Only)	LB1B-M1T1V*

Dimensions


1
2.6
1.2
2-R0.6
Gasket
Locking Ring
Panel Thickness:
0.5 to 3.2 mm
5.7
3.85
6.95
LOCK
TOP
Mounting Ring
0.6
ø18
1.95
8
□18
LOCK
17.8
15.8
0.8W × 0.5t
5
1
2
5.5
2.8W × 0.5t
6
8.8
7
20.9
9
*
18
24
20.8
18.8
11.9
11.1
23

* Solder/Tab Terminal

[SPDT/DPDT]

Round

Square

[3PDT]

Rectangular

[SPDT/DPDT]

[PC Board Terminal]

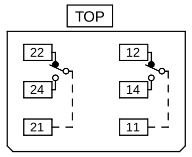
[Solder/Tab Terminal]

[3PDT]

All dimensions in mm.

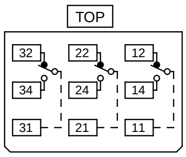
Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts


TOP
22
12
24
14
21
11

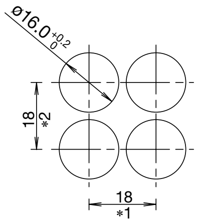
(SPDT contacts on the right only)

3PDT Contacts


TOP
32
22
12
34
24
14
31
21
11

Mounting Hole Layout

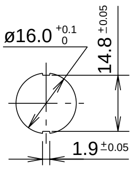
(LB1B/LB2B/LB3B/LB4B)


ø16.0 +0.2 0
18
*2
18
*1

∗1: 24 mm for rectangular units, 23.2 mm for 3PDT
∗2: 21 mm for 3PDT
Note: When using rubber boot or terminal cover, see dimensions on 56 and 58.

Panel Cut-out for Positioning

(LB1B/LB2B/LB3B/LB4B)


ø16.0 +0.1 0
14.8 ±0.05
1.9 ±0.05

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Selector Switches

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape: **LB①S-②③T④⑤**

Knob Operator

Round

Square

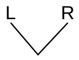
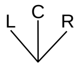
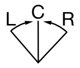
Rectangular

Lever Operator

Round

Square

Rectangular

② Operator Position		③ Contact	Part No.	
			Gold Contact	Silver Contact
90° 2-position	Maintained 	SPDT	**LB①S-2T1**	**LB①S-2T5**
		DPDT	**LB①S-2T2**	**LB①S-2T6**
		3PDT	**LB①S-2T3**	**LB①S-2T7**
45° 3-position	Maintained 	DPDT	**LB①S-3T2**	**LB①S-3T6**
		3PDT	**LB①S-3T3**	**LB①S-3T7**
	Spring return two-way 	DPDT	**LB①S-33T2**	**LB①S-33T6**
		3PDT	**LB①S-33T3**	**LB①S-33T7**

- Lever operators also available. To specify, see Part Number Development below.
- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- 2-position spring return from right, 3-position spring return from right, 3-position spring return from left also available. To specify, see Part Number Development below.
- For contact operation, see page 48.

Part Number Development

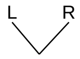
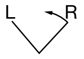
LB①S-②③T④⑤

① Shape

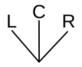
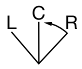
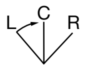
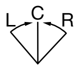
Code	Shape
1	Round
2	Square
3	Rectangular

② Operator Position

2-position

Operator Position	
2 Maintained 	**21** Spring return from right 

3-position

Operator Position			
3 Maintained 	**31** Spring return from right 	**32** Spring return from left 	**33** Spring return two-way 

③ Operator

Code	Operator Shape
Blank	Knob
L	Lever

④ Contacts

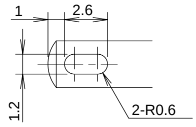
Code	Contact
1	Gold/SPDT (90° 2-position only)
2	Gold/DPDT
3	Gold/3PDT
5	Silver/SPDT (90° 2-position only)
6	Silver/DPDT
7	Silver/3PDT

⑤ Others

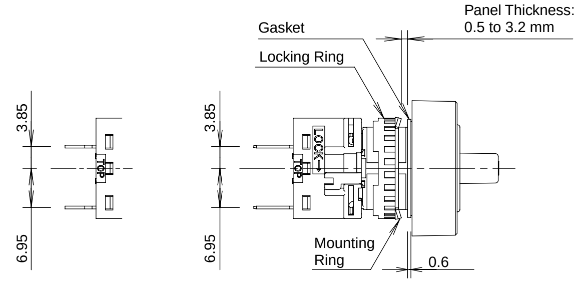
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
V	PC Board Terminal (Gold Contact Only)	LB1S-2T1V

Flush Silhouette LB Series
Flush Silhouette LBW Series
ø16 LB Series
UP Series

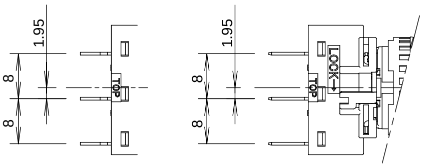
Dimensions



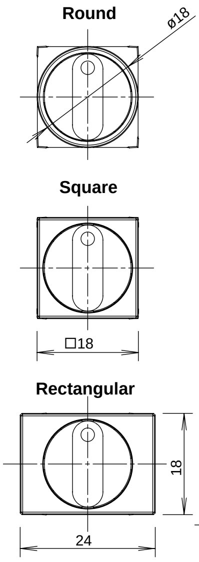
∗ Solder/Tab Terminal


Gasket
Locking Ring
Panel Thickness:
0.5 to 3.2 mm
3.85
6.95
3.85
6.95
TOP
LOCK
Mounting
Ring
0.6

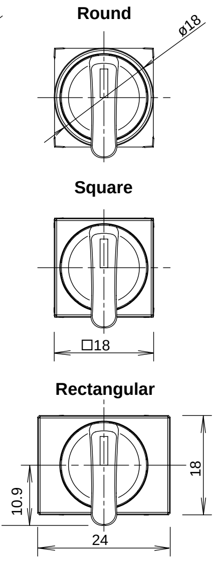
[SPDT/DPDT]


1.95
8
8
1.95
8
8
TOP
LOCK

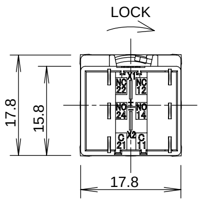
[3PDT]


Round
ø18
Square
□18
Rectangular
18
24

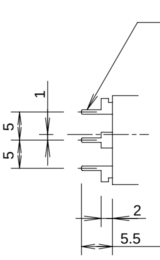
[Knob Operator]


Round
ø18
Square
□18
Rectangular
18
10.9
24

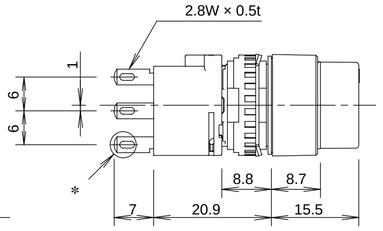
[Lever Operator]


LOCK
17.8
15.8
17.8
NO
22
NO
12
NO
24
NO
14
C
21
X2
C
11

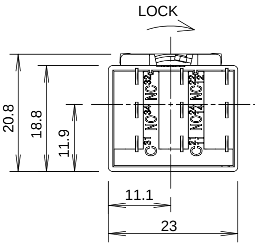
[SPDT/DPDT]


0.8W × 0.5t
1
5
5
2
5.5

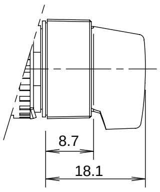
[PC Board Terminal]


2.8W × 0.5t
6
6
1
∗
8.8
8.7
7
20.9
15.5

[Knob Operator PC Board Terminal]


LOCK
20.8
18.8
11.9
C
31
NO
34
NC
32
C
21
NO
24
NC
22
11.1
23

[3PDT]

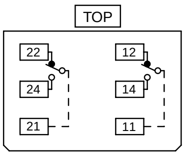


[Lever Operator]

All dimensions in mm.

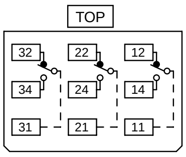
Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts


TOP
22
24
21
12
14
11

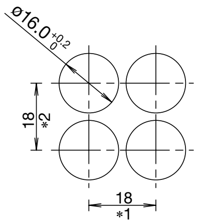
(SPDT contacts on the right only)

3PDT Contacts


TOP
32
34
31
22
24
21
12
14
11

Mounting Hole Layout

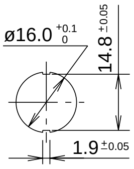
(LB1S/LB2S/LB3S)


ø16.0 +0.2 0
18
∗2
18
∗1

∗1: 24 mm for rectangular units, 23.2 mm for 3PDT
∗2: 21 mm for 3PDT
Note: When using terminal cover, see dimensions on page 58.

Panel Cut-out for Positioning

(LB1S/LB2S/LB3S)


ø16.0 +0.1 0
14.8 ±0.05
1.9 ±0.05

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

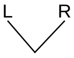
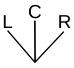
Illuminated Pushbutton
Pilot Light
Pushbutton
Selector
Illuminated Selector
Key Selector
Lever Switch
Buzzer
Accessories
Maintenance Parts
Panel Cut-out
Instructions

Illuminated Selector Switches

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape	LB①F-②T③④⑤*
	Round Square Rectangular

② Operator Position		③ Contact	④ LED Operating Voltage	Part No.		* Illumination Color Code
				Gold Contact	Silver Contact	
90° 2-position	Maintained 	SPDT	24V AC/DC	**LB①F-2T14***	**LB①F-2T54***	Specify the color code in place of * in the Part No. G: green R: red W: white
		DPDT	24V AC/DC	**LB①F-2T24***	**LB①F-2T64***	
45° 3-position	Maintained 	DPDT	24V AC/DC	**LB①F-3T24***	**LB①F-3T64***	

- Illuminated selector switches contain an LED unit. For maintenance LED units see page 60.
- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- 5V DC and 12V AC/DC LED operating voltages also available. To specify, see Part Number Development below.
- For contact operation, see page 48.

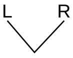
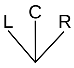
Part Number Development

LB①F-②T③④⑤*

① Shape

Code	Shape
1	Round
2	Square
3	Rectangular

② Operator Position

2-position	3-position
Operator Position	
2 Maintained 	**3** Maintained 

③ Contacts

Code	Contact
1	Gold/SPDT (90° 2-position only)
2	Gold/DPDT
5	Silver/SPDT (90° 2-position only)
6	Silver/DPDT

④ LED Operating Voltage

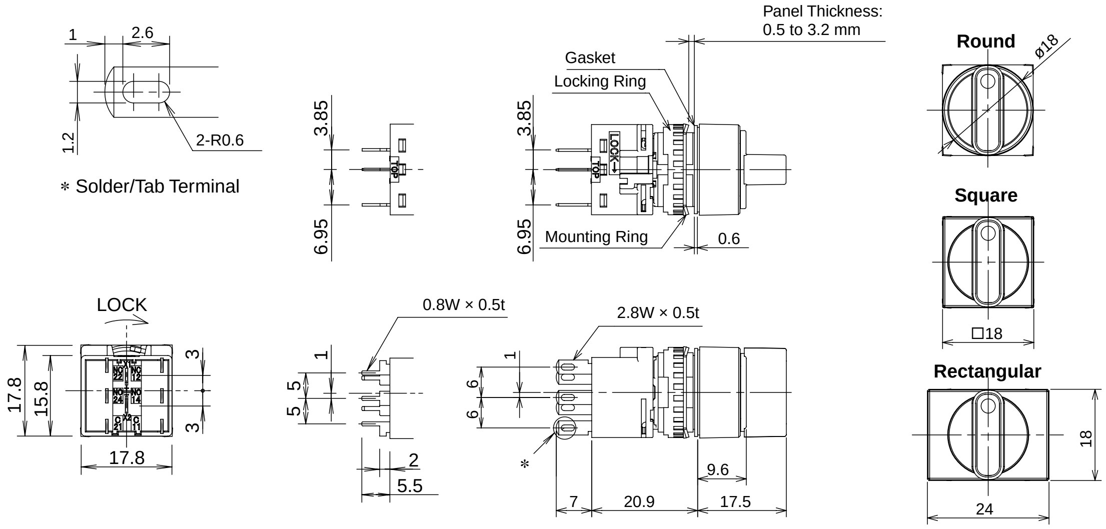
Code	Rated Operating Voltage
1	5V DC
3	12V AC/DC
4	24V AC/DC

⑤ Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
V	PC Board Terminal (Gold Contact Only)	LB1F-2T14V*

- Specify a color code in place of * in the Part No.

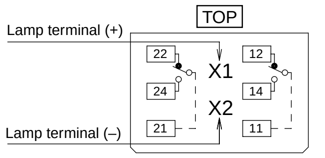
Dimensions


1
2.6
1.2
2-R0.6
∗ Solder/Tab Terminal
3.85
6.95
Panel Thickness:
0.5 to 3.2 mm
Gasket
Locking Ring
Mounting Ring
0.6
LOCK
TOP
Round
ø18
Square
□18
Rectangular
18
24
17.8
15.8
3
3
0.8W × 0.5t
2.8W × 0.5t
1
5
5
2
5.5
6
6
∗
9.6
7
20.9
17.5

[PC Board Terminal] **[Solder/Tab Terminal]**

All dimensions in mm.

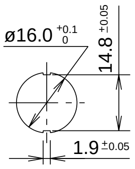
Terminal Arrangement (Bottom View)


TOP
Lamp terminal (+)
Lamp terminal (–)
22
24
21
12
14
11
X1
X2

(SPDT contacts on the right only)

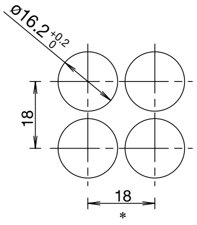
Panel Cut-out for Positioning

Round (LB1F/LB2F/LB3F)


ø16.0 +0.1 0
14.8 ±0.05
1.9 ±0.05

Mounting Hole Layout

Round (LB1F/LB2F/LB3F)


ø16.2 +0.2 0
18
18
∗

∗: 24 mm for rectangular units.
Note: When using terminal cover, see dimensions on page 58.

- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

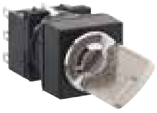
Key Selector Switches

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape: **LB①K-②③T④⑤-⑥**

Round



Square

Rectangular

② Operator Position		⑤ Key Removable Position	④ Contact	Part No.	
				Gold Contact	Silver Contact
90° 2-position	Maintained	A: Key removable in all positions Ⓛ Ⓡ	SPDT	**LB①K-2ST1A**	**LB①K-2ST5A**
			DPDT	**LB①K-2ST2A**	**LB①K-2ST6A**
			3PDT	**LB①K-2ST3A**	**LB①K-2ST7A**
45° 3-position	Maintained	A: Key removable in all positions Ⓛ Ⓒ Ⓡ	DPDT	**LB①K-3ST2A**	**LB①K-3ST6A**
			3PDT	**LB①K-3ST3A**	**LB①K-3ST7A**

- For operator position, see Part Number Development below.
- For key removable position, see Part Number Development below. The key cannot be removed at the return position.
- Two keys are supplied.
- Besides the standard key (key number 0H), six other keys are available.
- Disc tumbler keys also available. Only the standard key is available. To specify, see Part Number Development below.
- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- For contact operation, see page 48.

Part Number Development

LB①K-②③T④⑤-⑥

① Shape

Code	Shape
1	Round
2	Square
3	Rectangular

② Operator Position

Code	Operator Position
2	90° 2-position maintained
21	90° 2-position spring return from right
3	45° 3-position maintained
31	45° 3-position spring return from right
32	45° 3-position spring return from left
33	45°-3-position spring return two-way

③ Key Style

Code	Key Style
S	Wave key
Blank	Disc tumbler key

⑥ Key Number

Code	
Blank	Standard key (0H)
1H to 2H	Reversible key
3H to 6H	Non-reversible key

- Wave key only.

④ Contacts

Code	Contact
1	Gold/SPDT (90° 2-position only)
2	Gold/DPDT
3	Gold/3PDT
5	Silver/SPDT (90° 2-position only)
6	Silver/DPDT
7	Silver/3PDT

⑤ Key Removal Position

2-position

Key Removable Position			Spring return from right
A: Key removable in all positions Ⓛ Ⓡ	**B**: Key removable at left Ⓛ 🅡	**C**: Key removable at right 🅛 Ⓡ	Ⓛ 🅡

3-position

Key Removable Position			
A:Key removable in all positions Ⓛ Ⓒ Ⓡ	**B**:Key removable at left / center Ⓛ Ⓒ 🅡	**C**:Key removable at center / right 🅛 Ⓒ Ⓡ	**D**:Key removable at center 🅛 Ⓒ 🅡
E:Key removable at right / left Ⓛ 🅒 Ⓡ	**G**:Key removable at left Ⓛ 🅒 🅡	**H**:Key removable at right 🅛 🅒 Ⓡ	

For key selectors with the following operations, the key cannot be removed at the return position.

3-position

Spring return from right	Spring return from left	Spring return two-way
Ⓛ Ⓒ 🅡	🅛 Ⓒ Ⓡ	🅛 Ⓒ 🅡

- Key is removable at Ⓛ, Ⓒ, Ⓡ. Key is retained at 🅛, 🅒, and 🅡.

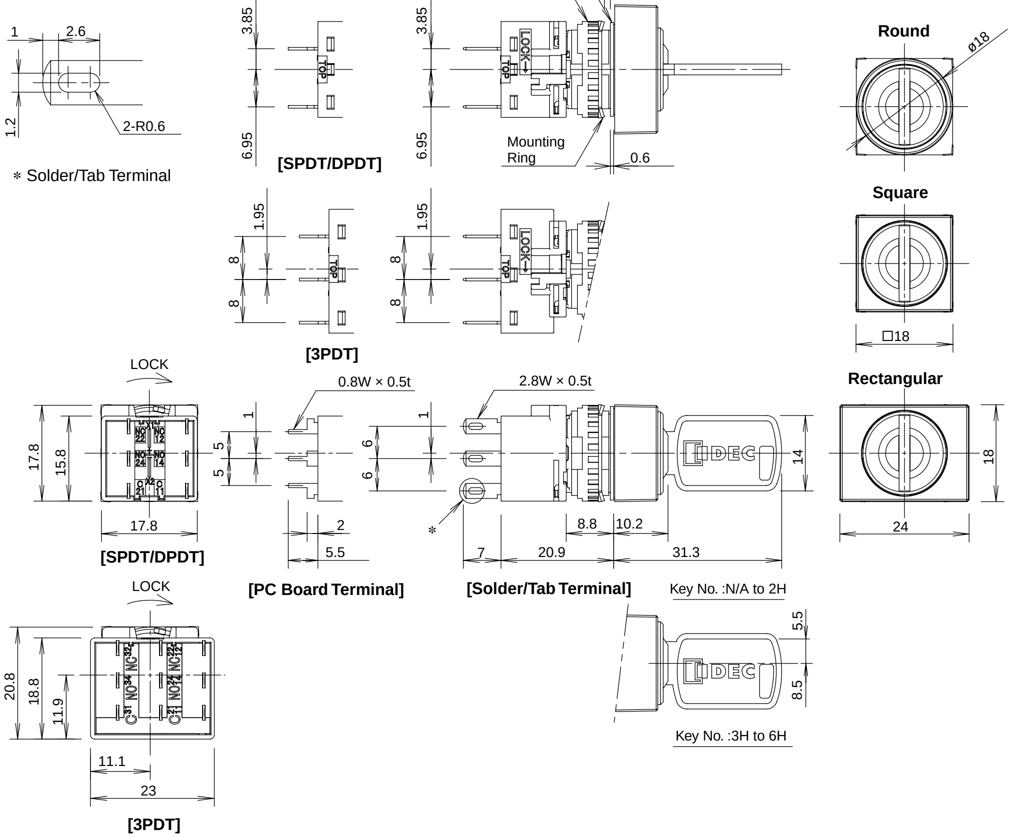
Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
V	PC Board Terminal (Gold Contact Only)	LB1K-2ST1VA

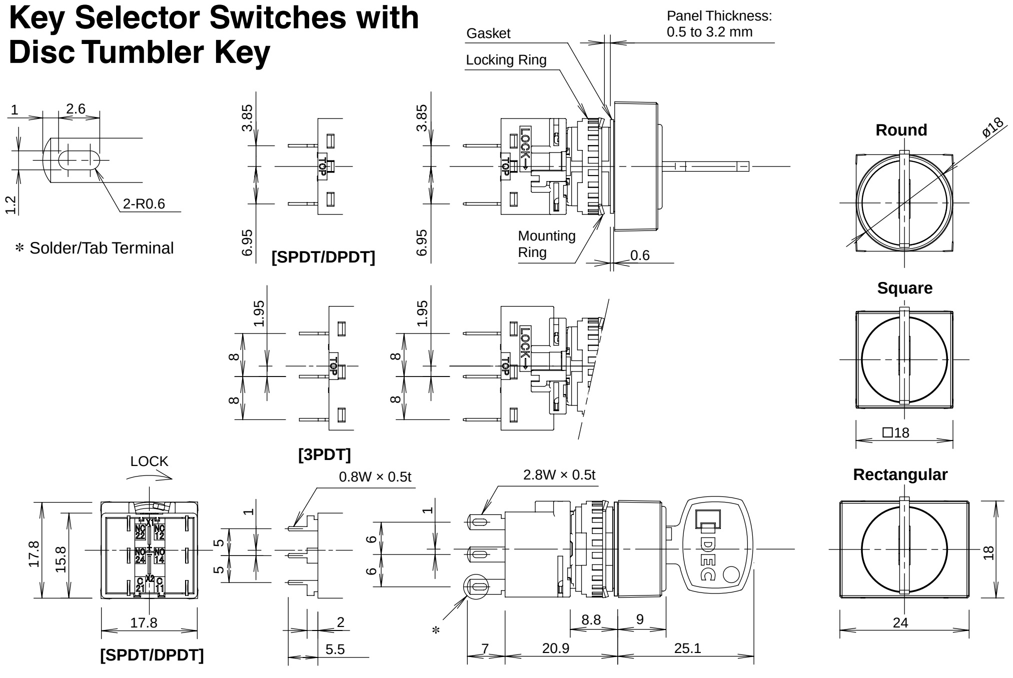
Flush Silhouette LB Series
Flush Silhouette LBW Series
ø16 LB Series
UP Series

Dimensions

Key Selector Switches with Wave Key


Gasket
Panel Thickness: 0.5 to 3.2 mm
Locking Ring
1
2.6
1.2
2-R0.6
∗ Solder/Tab Terminal
3.85
6.95
[SPDT/DPDT]
TOP
LOCK
Mounting Ring
0.6
Round
ø18
Square
□18
1.95
8
8
[3PDT]
LOCK
0.8W × 0.5t
2.8W × 0.5t
Rectangular
17.8
15.8
17.8
[SPDT/DPDT]
1
5
5
6
6
2
5.5
∗
7
20.9
8.8
10.2
31.3
14
18
24
IDEC
[PC Board Terminal]
[Solder/Tab Terminal]
Key No. :N/A to 2H
5.5
8.5
Key No. :3H to 6H
LOCK
20.8
18.8
11.9
11.1
23
[3PDT]

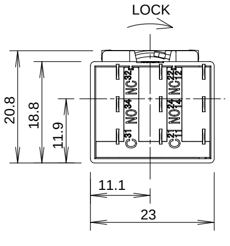
Key Selector Switches with Disc Tumbler Key


Gasket
Panel Thickness: 0.5 to 3.2 mm
Locking Ring
1
2.6
1.2
2-R0.6
∗ Solder/Tab Terminal
3.85
6.95
[SPDT/DPDT]
Mounting Ring
0.6
Round
ø18
Square
□18
1.95
8
8
[3PDT]
LOCK
0.8W × 0.5t
2.8W × 0.5t
Rectangular
17.8
15.8
17.8
[SPDT/DPDT]
1
5
5
6
6
2
5.5
∗
7
20.9
8.8
9
25.1
18
24
IDEC

All dimensions in mm.

[PC Board Terminal]

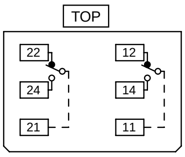
[Solder/Tab Terminal]


LOCK
20.8
18.8
11.9
11.1
23

[3PDT]

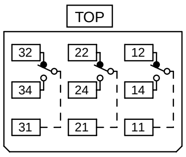
Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts


TOP
22
12
24
14
21
11

(SPDT contacts on the right only)

3PDT Contacts


TOP
32
22
12
34
24
14
31
21
11

- For details on mounting hole layout, see page 49.
- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Illuminated Pushbutton
Pilot Light
Pushbutton
Selector
Illuminated Selector
Key Selector
Lever Switch
Buzzer
Accessories
Maintenance Parts
Panel Cut-out
Instructions

Lever Switches

Solder/Tab Terminal

Package Quantity:1

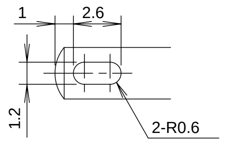
Part No. / Shape	
	Round

Operator Position			Contact	Part No.	
				Gold Contact	Silver Contact
2-position	Maintained	U D	SPDT	**LB1T-2T1**	**LB1T-2T5**
			DPDT	**LB1T-2T2**	**LB1T-2T6**
			3PDT	**LB1T-2T3**	**LB1T-2T7**
3-position	Maintained	U C D	DPDT	**LB1T-3T2**	**LB1T-3T6**
			3PDT	**LB1T-3T3**	**LB1T-3T7**
	Spring return from top/bottom	U C D	DPDT	**LB1T-33T2**	**LB1T-33T6**
			3PDT	**LB1T-33T3**	**LB1T-33T7**

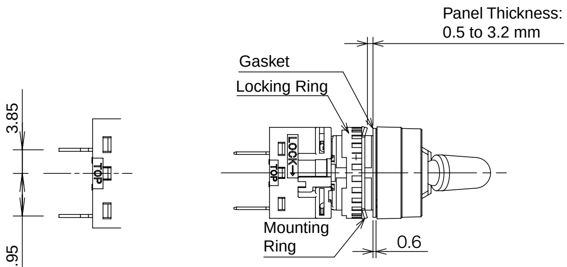
- PC board terminals available for gold contacts. Add “**V**” to the Part No.
  Example: **LB1T-2T1V**
- For contact operation, see page 48.

Dimensions

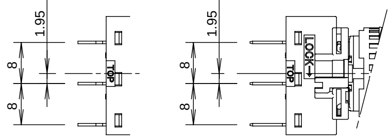
All dimensions in mm.



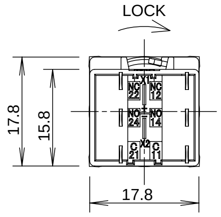
* Solder/Tab Terminal


Panel Thickness:
0.5 to 3.2 mm
Gasket
Locking Ring
3.85
6.95
TOP
LOCK
Mounting Ring
0.6

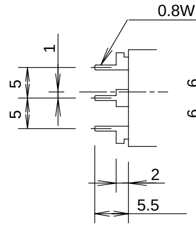
[SPDT/DPDT]


1.95
8
8
TOP
1.95
8
8
LOCK

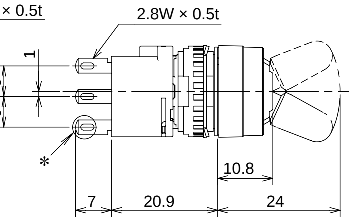
[3PDT]


LOCK
17.8
15.8
NO 22
NC 12
NO 24
NO 14
C 21
X2
C 11
17.8

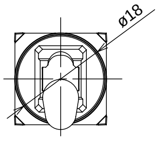
[SPDT/DPDT]

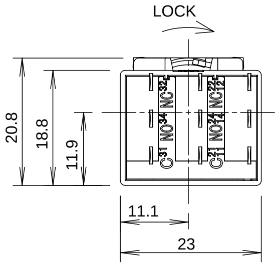

0.8W × 0.5t
1
5
5
2
5.5

[PC Board Terminal]


2.8W × 0.5t
1
6
6
*
10.8
7
20.9
24

[Solder/Tab Terminal]

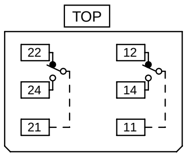



LOCK
20.8
18.8
11.9
C 31
NO 34
NC 32
C 21
NO 24
NC 22
11.1
23

[3PDT]

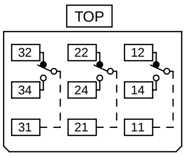
Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts


TOP
22
12
24
14
21
11

(SPDT contacts on the right only)

3PDT Contacts


TOP
32
22
12
34
24
14
31
21
11

- For details on mounting hole layout, see page 49.
- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

Buzzers

Specifications

Rated Insulation Voltage	30V
Rated Operating Voltage	12, 24V DC
Operating Voltage Range	12V DC±10%, 24V DC±10%
Current Draw	26mA
Inrush Current	80mA maximum
Sound Pressure (at 0.1m)	Steady sound: 80 dB minimum (at the rated voltage)
Sound Frequency	2.3±0.3kHz
Response Speed	50 ms maximum
Operating Temperature	–25 to +60°C (no freezing)
Storage Temperature	–30 to +80°C(no freezing)
Operating Humidity	45 to 85% (no condensation)
Insulation Resistance	100 MΩ minimum (500V DC megger)

Dielectric Strength	Between live and dead parts: 1,000V AC, 1 minute
Vibration Resistance	Operating extremes/Damage limits: 5 to 55 Hz, amplitude 0.5 mm
Shock Resistance	Operating extremes: 100m/s² Damage limits:1,000m/s²
Life	1,000 hours minimum (beep sound)
Degree of Protection	LB3Z-1T0∗: IP54 (IEC60529) LB3Z-104K: IP40 (IEC60529)
Terminal Style	LB3Z-1T0∗: Solder/tab terminal #110 PC board terminal LB3Z-104K: Solder terminal
Weight (approx.)	11g (LB3Z-1T0∗), 8g (LB3Z-104K)

- For applicable standards and UL, CSA ratings, see page 22.

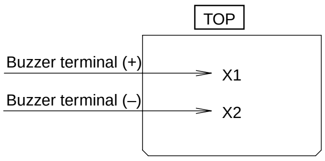
Name and Shape	Operating Voltage	Terminal Style	Part No.	
			IP54	IP40
Rectangular IP54 IP40	24V DC	Solder/tab terminal	**LB3Z-1T04**	—
		PC board terminal	**LB3Z-1T04V**	—
		Solder terminal	—	**LB3Z-104K**

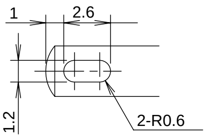
- 12V DC operating voltages also available. Specify “**-1T04**” in place of “**-1T03**” in the Part No.
  Example: **LB3Z-1T03**

Dimensions

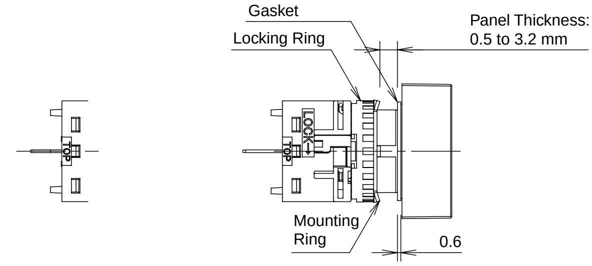
IP54

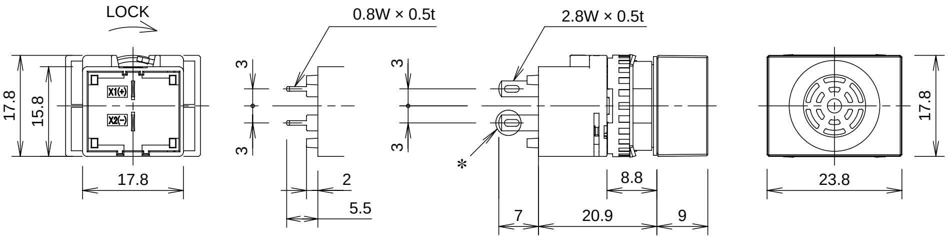
Terminal Arrangement (Bottom View)


TOP
Buzzer terminal (+)
X1
Buzzer terminal (–)
X2



∗ Solder/Tab Terminal

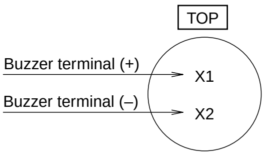

Gasket
Locking Ring
Panel Thickness:
0.5 to 3.2 mm
LOCK
TOP
Mounting Ring
0.6

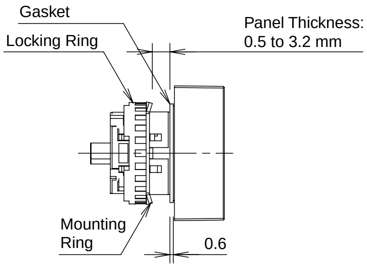

LOCK
17.8
15.8
X1(+)
X2(–)
17.8
0.8W × 0.5t
3
3
2
5.5
3
3
∗
2.8W × 0.5t
8.8
7
20.9
9
17.8
23.8

[PC Board Terminal] [Solder/Tab Terminal]

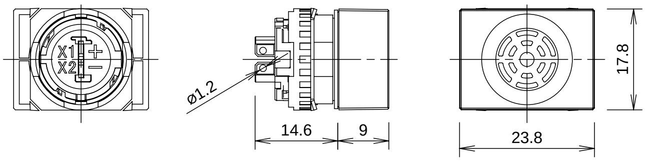
IP40

Terminal Arrangement (Bottom View)


TOP
Buzzer terminal (+)
X1
Buzzer terminal (–)
X2


Gasket
Locking Ring
Panel Thickness:
0.5 to 3.2 mm
Mounting Ring
0.6

- For details on mounting hole layout, see page 49.
- For details on pc board and circuit design, see page 50.
- For details on single board mounting, see page 51.

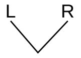
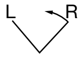
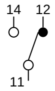
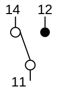
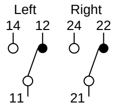
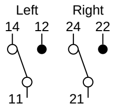
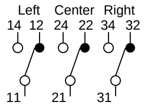
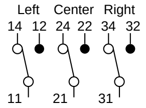
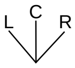
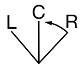
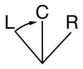
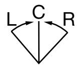
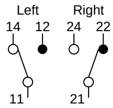
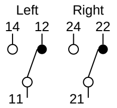
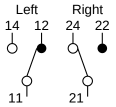
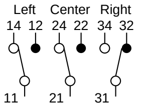
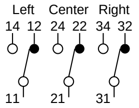
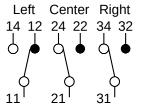

X1
X2
+
–
ø1.2
14.6
9
23.8
17.8

All dimensions in mm.

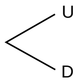
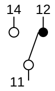
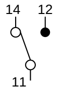
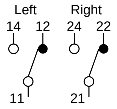
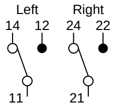
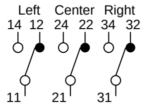
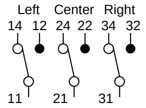
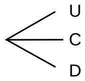
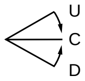
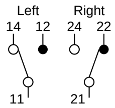
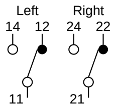
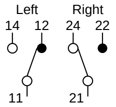
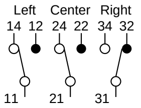
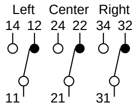
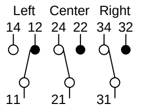
LB/LBW Series Contact Operation

Contact Operation

Selector Switch / Illuminated Selector Switch / Key Selector Switch

Operator Position & Contact Operation (Top View)					
Position		Contact	↖ Left	↑ Center	↗ Right
90° 2-position	 Maintained  Spring return from right	SPDT			
		DPDT	 Left Right 14 12 24 22 11 21		 Left Right 14 12 24 22 11 21
		3PDT	 Left Center Right 14 12 24 22 34 32 11 21 31		 Left Center Right 14 12 24 22 34 32 11 21 31
45° 3-position	 Maintained  Spring return from right  Spring return from left  Spring return two-way	DPDT	 Left Right 14 12 24 22 11 21	 Left Right 14 12 24 22 11 21	 Left Right 14 12 24 22 11 21
		3PDT	 Left Center Right 14 12 24 22 34 32 11 21 31	 Left Center Right 14 12 24 22 34 32 11 21 31	 Left Center Right 14 12 24 22 34 32 11 21 31

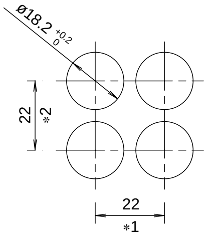
Lever Switch

Lever Position & Contact Operation (Top View)						
Position			Contact	Down	Center	Up
90° 2-position	 Maintained		SPDT			
			DPDT	 Left Right 14 12 24 22 11 21		 Left Right 14 12 24 22 11 21
			3PDT	 Left Center Right 14 12 24 22 34 32 11 21 31		 Left Center Right 14 12 24 22 34 32 11 21 31
45° 3-position	 Maintained	 Spring return two-way	DPDT	 Left Right 14 12 24 22 11 21	 Left Right 14 12 24 22 11 21	 Left Right 14 12 24 22 11 21
			3PDT	 Left Center Right 14 12 24 22 34 32 11 21 31	 Left Center Right 14 12 24 22 34 32 11 21 31	 Left Center Right 14 12 24 22 34 32 11 21 31

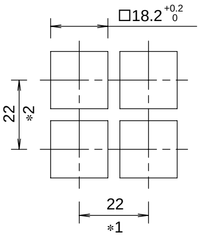
Mounting Hole Layout / PC Board Drilling Layout

LB Series Flush Bezel

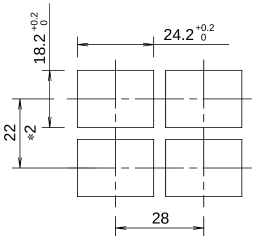
Round (LB6/LB6M)



Square (LB7/LB7M)



Rectangular (LB8/LB8M)

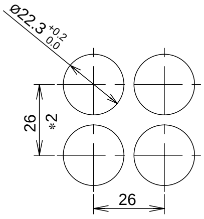


*1: 23.2 mm for 3PDT contacts
*2: 45 mm for switches with guard

Note: When using the LB series with a rubber boot or terminal cover, make sure to note the dimensions on page 56.

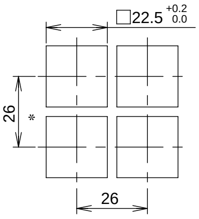
LBW Series Flush Bezel

Round (LBW6/LB6M/LBW6G)



* 53 mm for switches with guard

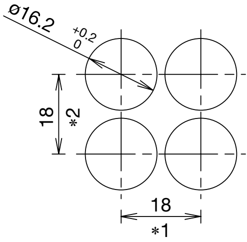
Square (LBW7/LBW7M/LBW7G)



* 53 mm for switches with guard

LB Series Standard Bezel

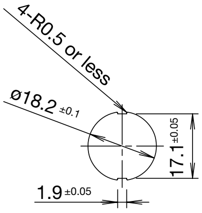
(LB1/LB2/LB3)



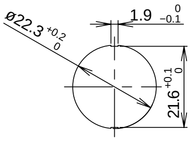
*1: 24 mm for rectangular type
23.2 mm for 3PDT contacts
*2: 21 mm for 3PDT contacts

Panel Cut-out for Positioning

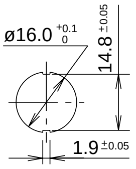
LB Series Flush Bezel
Round (LB6/LB6M)



LBW Series Flush Bezel
Round (LBW6/LBW6M/LBW6G)



LB Series Standard Bezel
Round (LB1/LB2/LB3)



Approval Ratings and CCC Approval File No.

UL

Gold Contact

Rated Operating Voltage	30V DC	125V AC
Rated Operating Current	0.1A	0.1A

Silver Contact

Rated Operating Voltage			30V	125V	250V
Rated Operating Current	AC	Res.	—	3.5 A	2, 3, 5A
		Ind.	—	2A	1.5A
	DC	Res.	2, 3, 5A	0.4A	—
		Ind.	1A	0.2A	—

CSA

Gold Contact

Rated Operating Voltage	30V DC	125V DC
Rated Operating Current	0.1A	0.1A

Silver Contact

Rated Operating Voltage			30V	125V	250V
Rated Operating Current	AC	Res.	—	3A	2, 3, 5A
		Ind.	—	2A	1.5A
	DC	Res.	2, 5A	0.4A	—
		Ind.	1A	0.2A	—

TÜV

Gold Contact

Rated Operating Voltage	30V DC	125V AC
Rated Operating Current	0.1A (DC-12)	0.1A (AC-12)

Silver Contact

Rated Operating Voltage		30V	125V	250V
Rated Operating Current	AC-12	—	3A	2, 5A
	DC-12	2, 5A	0.4A	—

CCC

Gold Contact

Rated Operating Voltage	30V DC	125V AC
Rated Operating Current	0.1A (DC-12)	0.1A (AC-12)

Silver Contact

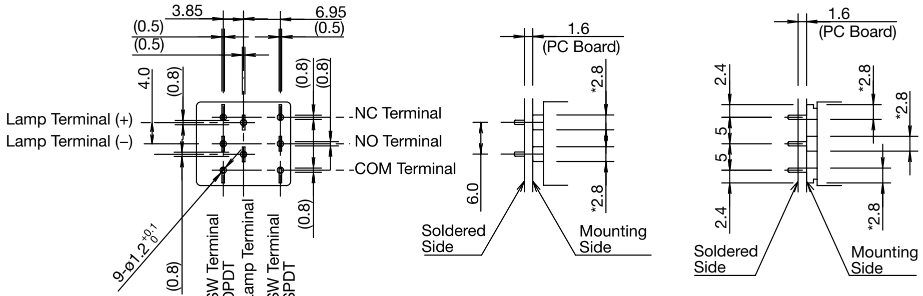
Rated Operating Voltage		30V	250V
Rated Operating Current	AC-12	—	2, 5A
	DC-12	2, 5A	—

LB/LBW Series Notes for Designing PC Board and Circuit

Notes for Designing PC Board and Circuit

- Use 1.6-mm-thick glass epoxy PC board with drilled holes.
- Design a circuit so that the LB/LBW series can operate within the rated voltage and current range. Make sure that inrush current and voltage do not exceed the rating.
- Minimum applicable load is 5V AC/DC, 1 mA on gold contacts. Applicable range is subject to the operating condition and load.
- Since the ∗2.8-mm-wide terminal touches the PC board as shown on the right, short circuit may occur with pattern lines. Design a circuit that prevents short circuits.

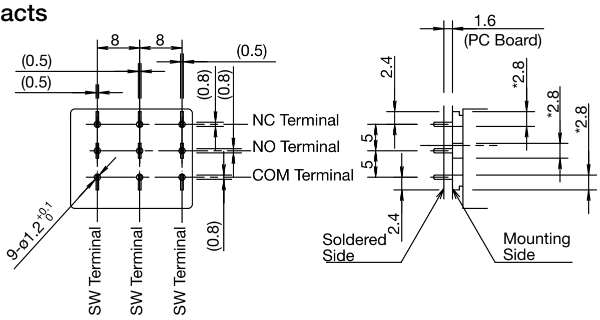
SPDT/DPDT Contacts


3.85
6.95
(0.5)
(0.5)
(0.5)
4.0
(0.8)
(0.8)
(0.8)
(0.8)
(0.8)
Lamp Terminal (+)
Lamp Terminal (–)
NC Terminal
NO Terminal
COM Terminal
9-ø1.2$^{+0.1}_{0}$
SW Terminal DPDT
Lamp Terminal
SW Terminal SPDT
1.6
(PC Board)
*2.8
*2.8
6.0
Soldered Side
Mounting Side
1.6
(PC Board)
2.4
5
5
2.4
*2.8
*2.8
*2.8
Soldered Side
Mounting Side

Lamp terminal

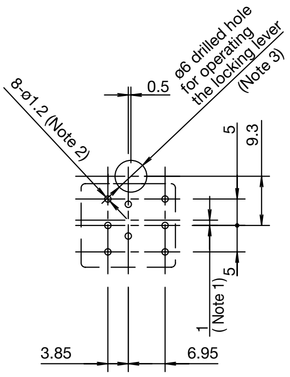
Switch terminal

3PDT Contacts

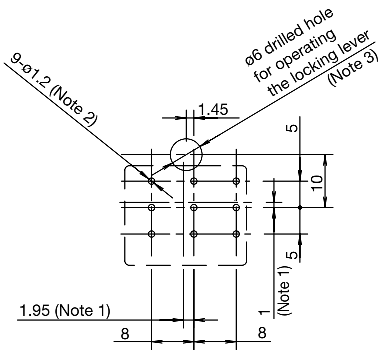

8
8
(0.5)
(0.5)
(0.5)
(0.8)
(0.8)
(0.8)
NC Terminal
NO Terminal
COM Terminal
9-ø1.2$^{+0.1}_{0}$
SW Terminal
SW Terminal
SW Terminal
1.6
(PC Board)
2.4
5
5
2.4
*2.8
*2.8
*2.8
Soldered Side
Mounting Side

PC Board Drilling Layout (Bottom View)

SPDT/DPDT Contacts


8-ø1.2 (Note 2)
0.5
ø6 drilled hole for operating the locking lever (Note 3)
5
9.3
5
1
(Note 1)
3.85
6.95

3PDT Contacts


9-ø1.2 (Note 2)
ø6 drilled hole for operating the locking lever (Note 3)
1.45
5
10
5
1
(Note 1)
1.95 (Note 1)
8
8

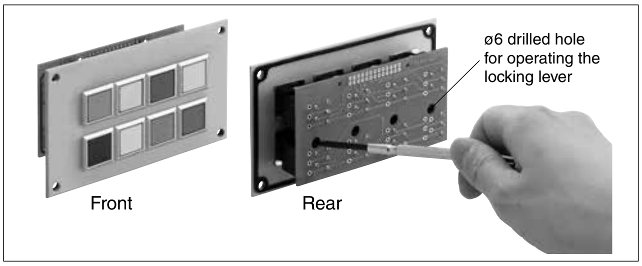
Note 1: When designing, note the alignment of center lines of the contact blocks and center lines of the operators.
Note 2: The diameter of the terminal hole is ø1.2.
Note 3: Hole diameter may vary to meet installation requirements. Determine the location and the size of the hole so that the locking lever can be operated.

All dimensions in mm.

Flush Silhouette LB Series
Flush Silhouette LBW Series
ø16 LB Series
UP Series
Illuminated Pushbutton
Pilot Light
Pushbutton
Selector
Illuminated Selector
Key Selector
Lever Switch
Buzzer
Accessories
Maintenance Parts
Panel Cut-out
Instructions

Single Board Mounting

LB/LBW Series is available for single board mounting.


ø6 drilled hole for operating the locking lever
Front
Rear

Installing and Removing Contact Blocks

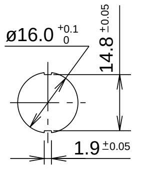
Turn the locking lever to install and remove contact blocks on the PC using a screwdriver from a hole in the PC board. See "Notes for Designing PC Board and Circuit" on page 50. Determine the location of the switches so that the locking lever can be operated. See "Removing and Installing the Contact Block" on page 61.

Mounting Holes and Assembly Procedure

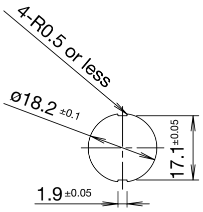
Drill mounting holes in the panel as shown below. When the units are mounted collectively, provide adequate clearance.

Panel Cut-out for Positioning

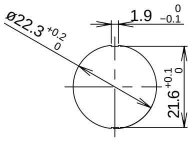
Standard Bezel (LB1/LB2/LB3/LB4)


ø16.0 +0.1 0
14.8 ±0.05
1.9 ±0.05

LB Series Flush Bezel (LB6/LB6M/LB6G)


4-R0.5 or less
ø18.2 ±0.1
17.1 ±0.05
1.9 ±0.05

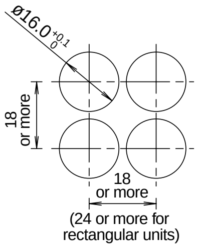
LBW Series Flush Bezel (LBW6/LBW6M/LBW6G)


ø22.3 +0.2 0
1.9 0 −0.1
21.6 +0.1 0

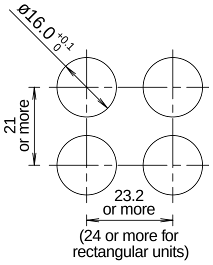
Mounting Hole Layout

Standard Bezel (LB1/LB2/LB3/LB4)

SPDT/DPDT Contacts


ø16.0 +0.1 0
18 or more
18 or more
(24 or more for rectangular units)

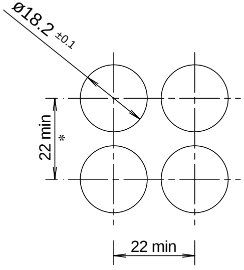
3PDT Contacts

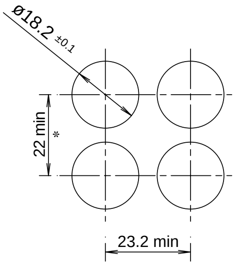

ø16.0 +0.1 0
21 or more
23.2 or more
(24 or more for rectangular units)

LB Series Flush Bezel

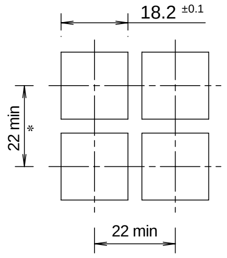
SPDT/DPDT Contacts **3PDT Contacts**

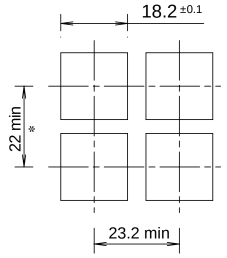
LB6/LB6M/LB6G


ø18.2 ±0.1
22 min
*
22 min

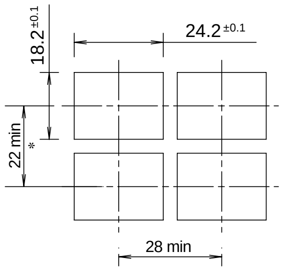

ø18.2 ±0.1
22 min
*
23.2 min

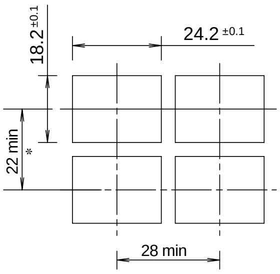
LB7/LB7M/LB7G


18.2 ±0.1
22 min
*
22 min


18.2 ±0.1
22 min
*
23.2 min

LB8/LB8M/LB8G

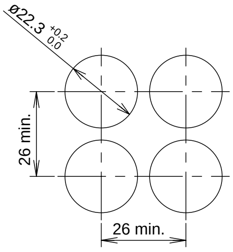

18.2 ±0.1
24.2 ±0.1
22 min
*
28 min

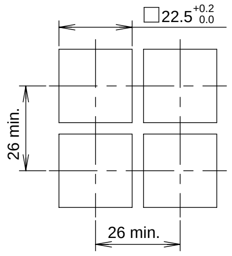

18.2 ±0.1
24.2 ±0.1
22 min
*
28 min

* 45 mm minimum for switches with guard

LBW Series Flush Bezel **LBW Series Flush Bezela**

LBW6/LBW6M/LBW6G **LBW7/LBW7M/LBW7G**


ø22.3 +0.2 0.0
26 min.
26 min.


□22.5 +0.2 0.0
26 min.
26 min.

* 53 mm minimum for switches with guard

Assembly Procedure

1. Install the operator to the panel.
2. Mount the contact block to the operator from the rear.
3. Turn the locking lever to lock the contact block.
4. Insert the PC board to terminals and solder.

Note 1: Make sure that each terminal is inserted into the PC board correctly.
Note 2: Do not apply tensile force to the connector cable for an extended period of time.
Note 3: Do not expose the contact block to water.
Note 4: Ensure to lock contact blocks when the contact blocks are installed on the operators.

- UP series can be installed on the same board. For details, see page 52.

UP Series Single Board Mount Pilot Lights

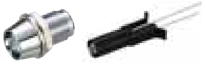
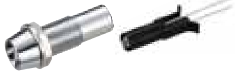
Mounts on the same panel as LB/LBW series

- Three illumination colors: Green (G), red (R), and white (W)

Specifications

Color Code		Red (R), White (W)	G (Green)
Rated Current (I)		7mA	2mA
Maximum Current (Ta: 25°C)	Reverse Voltage (V_R)	9V	5V
	Operating Temperature (T_{opr})	–25 to +55°C (no freezing)	
	Storage Temperature (T_{stg})	–30 to +80°C (no freezing)	
Forward Voltage (V_f)		Standard value: 2V (If=7mA)	Standard value: 2.7V (If=2 mA)
Dielectric Voltage		Between live and dead parts: 500V AC, 1 minute	
Weight (approx.)		4.3g (UP8-89V1), 5.1g (UP8-89V2)	

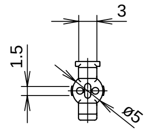
UP Series

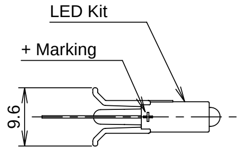
Mounting Hole Size	Shape	Degree of Protection (IEC 60529)	Mountable Unit	Part No.	Ordering No.	Illumination Color Code	Package Quantity
ø8 UP8 With standard bezel  With flush bezel 	Shroud	IP40	Standard Bezel	**UP8-89V1∗**	**UP8-89V1∗PN10**	Specify the color code in place of ∗ in the Part No. G: green R: red W: white	10
			Flush Bezel	**UP8-89V2∗**	**UP8-89V2∗PN10**		
ø9 UP9P	Shroud	IP65	Standard bezel Flush bezel	**UP9P-99V1∗**	**UP9P-99V1∗PN10**		10

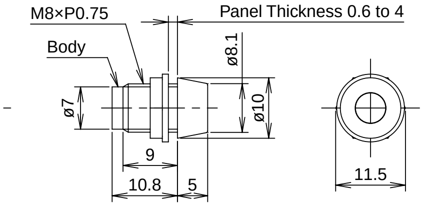
- LED cannot be replaced.

Note: Connect an external current limiting resistor in series. Otherwise, the LED may be damaged.

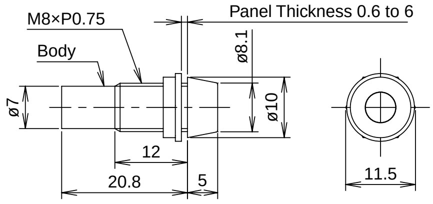
Dimensions



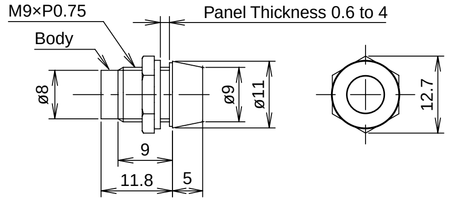

LED Kit
+ Marking
9.6


M8×P0.75
Panel Thickness 0.6 to 4
Body
ø8.1
ø7
ø10
9
10.8
5
11.5

UP8-89V1

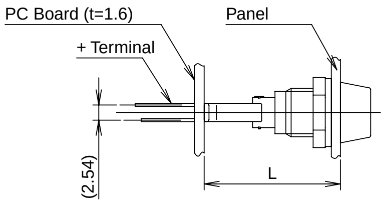

M8×P0.75
Panel Thickness 0.6 to 6
Body
ø8.1
ø7
ø10
12
20.8
5
11.5

UP8-89V2


M9×P0.75
Panel Thickness 0.6 to 4
Body
ø8
ø9
ø11
12.7
9
11.8
5

UP9P-99V1

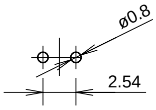
[Assembly Drawing]


PC Board (t=1.6)
Panel
+ Terminal
(2.54)
L

Dimensions (L)

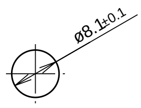
Standard Bezel	22.5mm
Flush Bezel	29.9mm

PC Board Mounting Hole

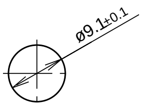


Panel Cut-out

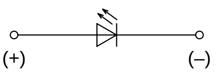
UP8



UP9P



Internal Circuit



The longer pin is the positive terminal

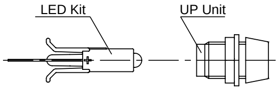
All dimensions in mm.

Safety Precautions

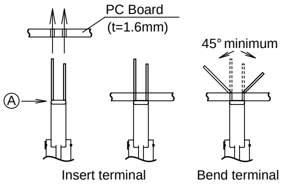
- **Turn off power to the unit before installation, removal, wiring, maintenance, and inspection.
Failure to turn off may cause electrical shocks or fire hazard.**
- **For wiring, use wires of a proper size to meet the voltage and current requirements.**
- **Improper soldering or failure to tighten the terminal screw may cause overheating and fire.**

Single Board Mounting

UP series miniature pilot light single board mounting types can be mounted with LB/ LBW series on the same panel.
Follow the instructions below on single board mounting.



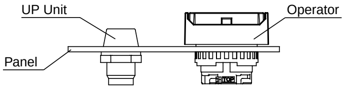
1. Mount the LED kit to the PC board.



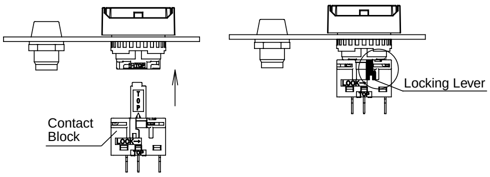
Temporary mounting

1. Note the polarity of the terminals and insert the terminals to the PC board.
2. Make sure that part A of the LED kit is pressed tightly to the PC board. Bend the terminals sideways as shown on the left.

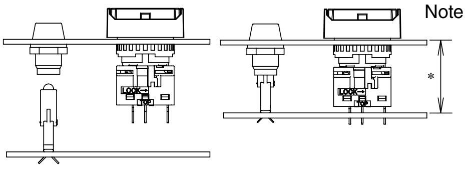
2. Mount the operator and the UP series pilot lights on to the control panel.



3. Mount the contact block to the operator of the miniature control unit and lock the unit by turning the locking lever.



4. Install the PC board in 1. to the panel in 3.



Note: Make sure that the LED kit is inserted into the UP series unit.

* When mounting LB/LBW and UP series on a single board, make sure that the distance between the front of the panel and the mounting side of the PC board (gasket distortion is taken into consideration) is as shown in the table below.

Part No.	Mountable Unit	Distance (*)
UP8-89V1*	Standard bezel	22.5mm
UP8-89V2*	Flush bezel	29.9mm
UP9P-99V1*	Standard bezel	22.5mm
	Flush bezel	29.9mm

5. Solder the terminals.
Before soldering, make sure that each terminal of the contact block is securely inserted into the PC board holes.

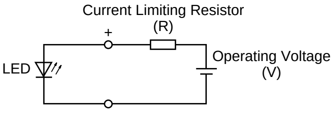
Instructions

Polarity

Pay attention to the polarity of the power supply as UP series units do not contain a diode for protection against reverse polarity. The long terminal is positive and the short terminal is negative.

Current Limiting Resistor

When using a UP series unit without a built-in current limiting resistor, connect an external current limiting resistor. Calculate the resistance using the following formula.



$$\text{Resistance }(\Omega)=\frac{\text{Operating Voltage (V)} - \text{Forward Voltage (Vf)}}{\text{Rated Current (I)} *}$$

* Rated Current (I) = R (red), W (white) : 0.007A
G (green) : 0.002A
Forward Voltage (Vf) = R (red), W (white): 2V
G (green) : 2.7V

Note: Use a resistor of higher resistance than the calculated value (Ω)

$$\text{Rated Wattage of Resistor (W)} = \text{Rated Current (I)} \times \text{Operating Voltage (V)} \times 2 \text{ to } 3 *$$

* 2 to 3 is a safety factor

<Current Limiting Resistor Reference Value>

Color Operating Voltage	Red (R), White (W)	Green (G)
5V DC	430Ω (1/4W)	1200Ω (1/4W)
6V DC	560Ω (1/4W)	1600Ω (1/4W)
12V DC	1500Ω (1/4W)	4700Ω(1/4W)
24V DC	3000Ω (1/2W)	11000Ω(1/4W)

Countermeasures against Dim Lighting

See page 66.

Wiring

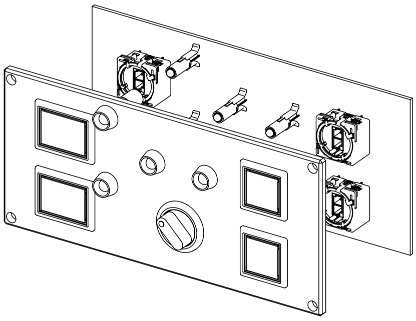
Solder the terminal at 350°C within 3 seconds using a 60W soldering iron. SnAgCu type lead-free solder is recommended. When soldering, do not touch the pilot light housing with the terminal. Do not bend the terminal or apply excessive force to the terminal.

Notes on Panel Mounting

Tightening torque should not exceed 0.49 N·m. Do not use pliers. Do not tighten with excessive force, otherwise the locking ring will be damaged.

PC Board and Circuit Design

Use glass epoxy copper clad laminate, double-sided through-hole PC boards with a thickness of 1.6 mm.

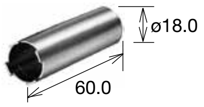
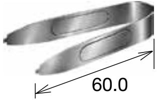
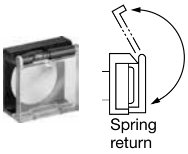
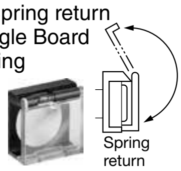
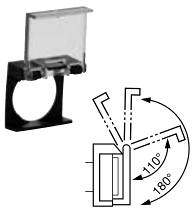


Example of single board mounting

LB/LBW Series Accessories

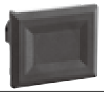
Accessories

Package Quantity:1

Shape				Specification	Part No.	Ordering No.	Package Quantity	Remarks
Locking Ring Wrench 				Metal (Nickel-plated brass)	**MT-001**	**MT-001**	1	Used to tighten the locking ring when installing the units on to the panel.
For Standard Bezels	Lens Removal Tool 			Stainless Steel	**MT-101**	**MT-101**	1	Used to remove the lens or button. (for standard bezels)
	Switch Guard (spring return)	180° Spring return 	For round / square units (LB1/LB2)	Guard (Polyacetal) Base (Polyarylate)	**AL-K6SP**	**AL-K6SP**	1	Degree of protection: IP65 Used to protect pushbuttons and illuminated pushbuttons from inadvertent operation. See page 56 for dimensions. With the gasket mounted on the switch, attach the switch guard and mount on the panel.
			For rectangular units (LB3/LB4)		**AL-KH6SP**	**AL-KH6SP**	1	
		180° Spring return for Single Board Mounting 	For rectangular units (LB3/LB4)	Guard (Polyacetal) Base (Polyarylate)	**LA9Z-K3**	**LA9Z-K3**	1	Degree of protection: IP65 With the gasket mounted on the switch, attach the switch guard and mount on the panel. See page 56 for dimensions.
	Switch guard (remains open)	Remains 110°/180° open (Can be used for single board mounting) 	For round / square units (LB1/LB2)	Guard (Polyacetal) Base (Polyarylate)	**LB9Z-K2**	**LB9Z-K2**	1	Degree of protection: IP40 Used to protect pushbuttons and illuminated pushbuttons from inadvertent operation. See page 56 for dimensions. With the gasket mounted on the switch, attach the switch guard and mount on the panel. See page 56 for dimensions. When using for single board mounting, remove the rubber gasket from the switch.
			For rectangular units (LB3/LB4)		**LB9Z-K3P**	**LB9Z-K3P**	1	Degree of protection: IP65 With the gasket mounted on the switch, attach the switch guard and mount on the panel. See page 56 for dimensions.
	Rubber Boot ①		1. For round units (LB1)	Rubber (Transparent silicon rubber)	**LB9Z-D1**	**LB9Z-D1**	1	Degree of protection: IP65 See page 56 for dimensions. See page 65 for mounting.
	②		2. For square units (LB2)		**LB9Z-D2**	**LB9Z-D2**	1	
	③		3. For rectangular units (LB3/LB4)		**LB9Z-D3**	**LB9Z-D3**	1	
	Mounting Hole Plug		Metal	[Plug] Metal (Zinc diecast) [Locking nut] Polyacetal [Gasket] Nitrile rubber	**AL-BM6**	**AL-BM6**	1	Degree of protection: IP65 Tightening torque: 0.1 to 0.29 N·m See page 56 for dimensions.
	Mounting Hole Plug		Rubber	Nitrile rubber (black)	**AL-B6**	**AL-B6PN05**	5	Degree of protection: IP65 See page 56 for dimensions.

Accessories

Package Quantity:1

Shape			Specification	Part No.	Ordering No.	Package Quantity	Remarks
For LB Series Flush Bezels	Rubber Boot ① ② ③	1. For round units (LB6/LB6M)	Rubber (Transparent silicon rubber)	**LB9Z-D6**	**LB9Z-D6**	1	Degree of protection: IP65 See page 57 for dimensions. See page 65 for mounting.
		2. For square units (LB7/LB7M)		**LB9Z-D7**	**LB9Z-D7**	1	
		3. For rectangular units (LB8/LB8M)		**LB9Z-D8**	**LB9Z-D8**	1	
	Mounting Hole Plug ① ② ③ 	1. For round units (LB6/LB6M)	[Plug] Polyamide (Black) [Gasket] Nitrile rubber [Mounting Plate] Stainless Steel	**LB9Z-BS6∗**	**LB9Z-BS6∗**	1	∗ Color code: blank (black), W (white) Degree of protection: IP65 Panel thickness: 0.5 to 3.2 mm See page 57 for dimensions.
		2. For square units (LB7/LB7M)		**LB9Z-BS7∗**	**LB9Z-BS7∗**	1	
		3. For rectangular units (LB8/LB8M)		**LB9Z-BS8∗**	**LB9Z-BS8∗**	1	
For LBW Series Flush Bezels	Mounting Hole Plug ① ②	1. For round units (LBW6/LB6W6M)	[Plug] Polyamide (Black) [Gasket] Nitrile rubber [Mounting Plate] Stainless Steel	**LBW9Z-BS6∗**	**LBW9Z-BS6∗**	1	∗ Color code: blank (black), W (white) Degree of protection: IP65 Panel thickness: 0.5 to 3.2 mm See page 58 for dimensions.
		2. For rectangular units (LBW7/LB6W7M)		**LBW9Z-BS7∗**	**LBW9Z-BS7∗**	1	
	Mounting Hole Plug 	Metal	[Plug] Zinc diecast [Locking Ring] Polyamide [Gasket] Nitrile rubber	**LW9Z-BM**	**LW9Z-BM**	1	Degree of protection: IP66 Tightening torque: 1.2 N·m See page 58 for dimensions.
	Mounting Hole Plug 	Rubber	Nitrile rubber	**LW9Z-BP1**	**LW9Z-BP1**	1	Degree of protection: IP65 Tightening torque: 2.0 N·m See page 58 for dimensions.
Terminal Cover ① ②		1. For SPDT/DPDT contacts	PBT (White)	**LB9Z-VL2**	**LB9Z-VL2PN10**	10	See page 58 for dimensions. See page 61 for mounting.
		2. For 3PDT contacts		**LB9Z-VL3**	**LB9Z-VL3PN10**	10	
Key Reversible key Non-reversible key		For key selector switches (wave key)	Metal (zinc nickel-plated)	**LA9Z-SK-∗**	**LA9Z-SK-∗PN02**	2	Specify a key number in place of ∗ in the Part No. Blank: Standard key 0H (reversible) 1H to 2H: Reversible key 3H to 6H: Non-reversible key See page 58 for dimensions.
Keys 		For key selector switches (disc tumbler key)	Metal (brass nickel-plated) 18×1.8×25.1 t1.8	**AS6-SK-132**	**AS6-SK-132PN02**	2	

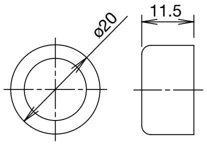
Dimensions for Accessories

For LB Series Standard Bezel

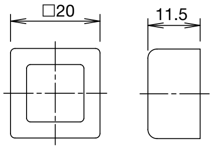
All dimensions in mm.

Rubber Boot

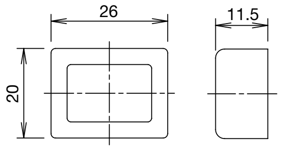
For round units
(LB9Z-D1)



For square units
(LB9Z-D2)

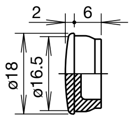


For rectangular units
(LB9Z-D3)

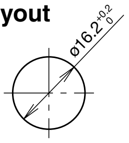


Mounting Hole Plug

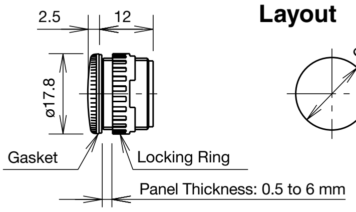
AL-B6



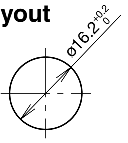
Mounting Hole Layout



AL-BM6

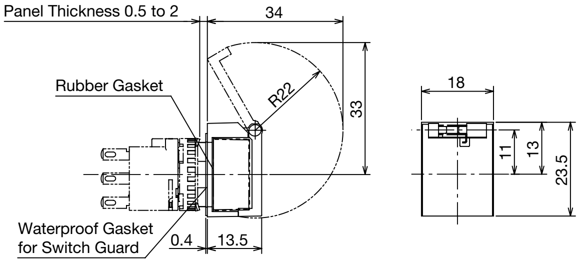

2.5
12
ø17.8
Gasket
Locking Ring
Panel Thickness: 0.5 to 6 mm

Mounting Hole Layout

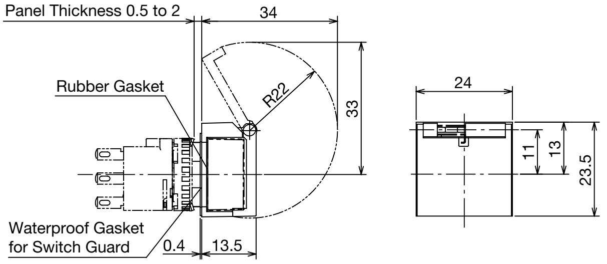


Switch Guard (Spring Return)

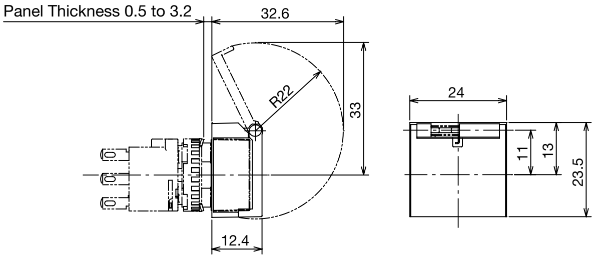
For round / square units
(AL-K6SP)


Panel Thickness 0.5 to 2
34
Rubber Gasket
R22
33
18
11
13
23.5
Waterproof Gasket
for Switch Guard
0.4
13.5

For rectangular units
(AL-KH6SP)


Panel Thickness 0.5 to 2
34
Rubber Gasket
R22
33
24
11
13
23.5
Waterproof Gasket
for Switch Guard
0.4
13.5

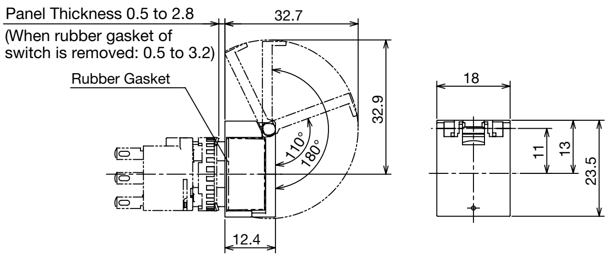
For Single Board Mounting (LA9Z-K3) (Note)


Panel Thickness 0.5 to 3.2
32.6
R22
33
24
11
13
23.5
12.4

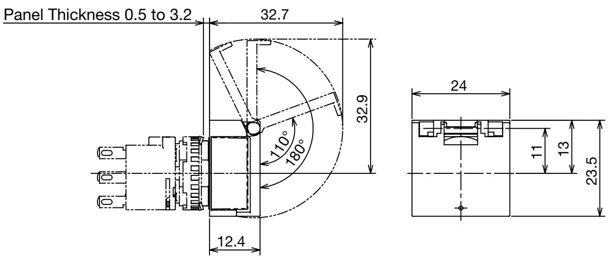
Note: The panel depth is the same for switches with or without switch guards. Both types can be installed on the same PC board.

Switch Guard (Remains Open)

For round / square units (Note)
(LB9Z-K2)


Panel Thickness 0.5 to 2.8
(When rubber gasket of
switch is removed: 0.5 to 3.2)
Rubber Gasket
32.7
32.9
110°
180°
18
11
13
23.5
12.4

For rectangular units (Note)
(LB9Z-K3P)

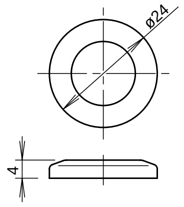

Panel Thickness 0.5 to 3.2
32.7
32.9
110°
180°
24
11
13
23.5
12.4

Dimensions for Accessories

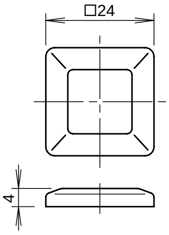
For LB Series Flush Bezel

Rubber Boot

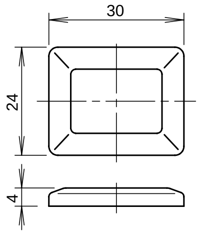
For round units (LB9Z-D6)



For square units (LB9Z-D7)

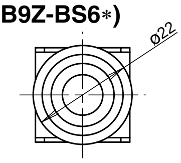


For rectangular units (LB9Z-D8)

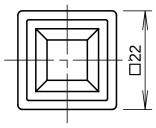


Mounting Hole Plug

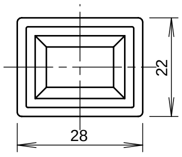
For round units (LB9Z-BS6∗)

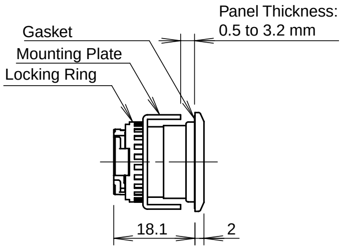


For square units (LB9Z-BS7∗)

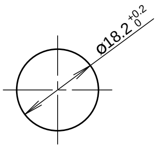


For rectangular units (LB9Z-BS8∗)

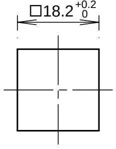



Panel Thickness:
0.5 to 3.2 mm
Gasket
Mounting Plate
Locking Ring
18.1
2

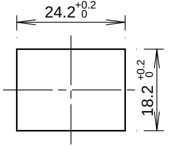
Mounting Hole Layout



Mounting Hole Layout



Mounting Hole Layout


24.2 +0.2 0
18.2 +0.2 0

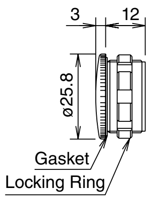
LB/LBW Series Accessories

Dimensions for Accessories

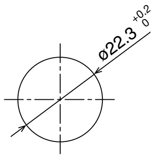
For LB Series Flush Bezel

Mounting Hole Plug

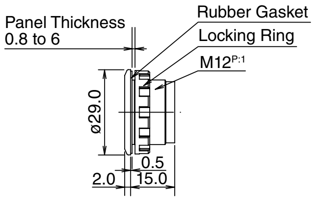
Metal
(LW9Z-BM)


3
12
ø25.8
Gasket
Locking Ring

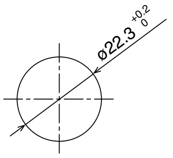
Mounting Hole Layout



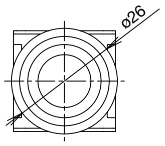
Rubber
(LW9Z-BP1)


Panel Thickness
0.8 to 6
Rubber Gasket
Locking Ring
M12P:1
ø29.0
0.5
2.0
15.0

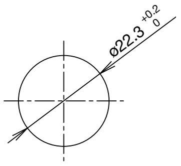
Mounting Hole Layout



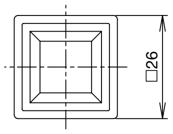
For round units
(LBW9Z-BS6*)



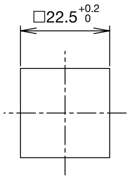
Mounting Hole Layout

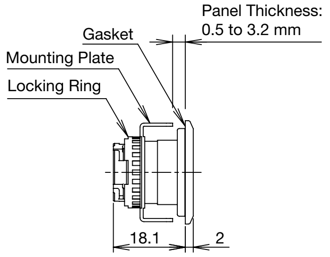


For square units
(LBW9Z-BS7*)



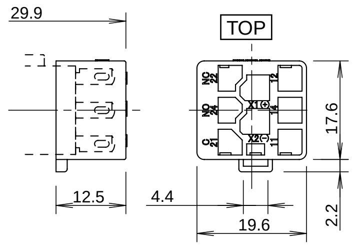
Mounting Hole Layout



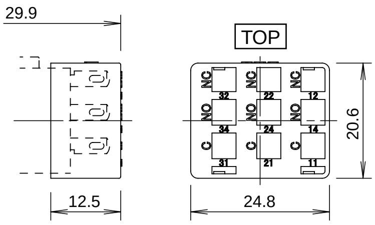

Panel Thickness:
0.5 to 3.2 mm
Gasket
Mounting Plate
Locking Ring
18.1
2

Terminal Cover

For SPDT/DPDT contacts
(LB9Z-VL2)

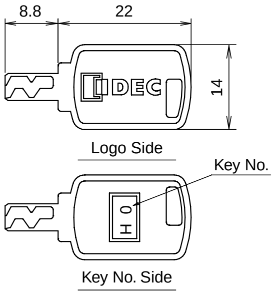

29.9
TOP
NC 22
NO 24
C 21
12
X1(+)
14
X2(−)
11
17.6
12.5
4.4
19.6
2.2

For 3PDT contacts
(LB9Z-VL3)

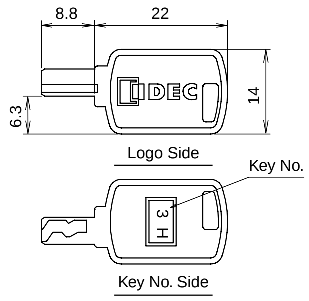

29.9
TOP
NC
NC
NC
32
22
12
NO
NO
NO
34
24
14
C
C
C
31
21
11
20.6
12.5
24.8

Key (Wave Key)

Reversible key


8.8
22
IDEC
14
Logo Side
Key No.
0 H
Key No. Side

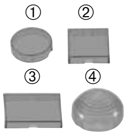
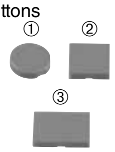
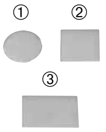
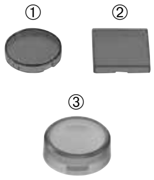
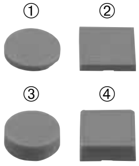
Non-reversible key


8.8
22
IDEC
14
6.3
Logo Side
Key No.
3 H
Key No. Side

All dimensions in mm.

Flush Silhouette LB Series
Flush Silhouette LBW Series
ø16 LB Series
UP Series

Accessories

Shape			Material / Dimensions (W×H×D)	Part No.	Ordering No.	Package Quantity	Remarks
LB Series	Lens 	1. For round units	Polyarylate ø15.4 H4	**AL6M-L***	**AL6M-L*PN05**	5	Specify the color code in place of * in the part no. A: Amber, C: Clear, G: Green, R: Red, S: Blue, Y: Yellow Note: Use a clear lens for white (W) or pure white (PW) illumination.
		2. For square units	Polyarylate □15.4 H4	**AL6Q-L***	**AL6Q-L*PN05**	5	
		3. For rectangular units	Polyarylate W21.4 H4 D15.4	**AL6H-L***	**AL6H-L*PN05**	5	
		4. For dome units	Polyarylate ø16 H9.4	**AL6D-L***	**AL6D-L*PN05**	5	
	Buttons 	1. For round units	Polyarylate ø15.4 H4	**AB6M-B***	**AB6M-B*PN05**	5	Specify the color code in place of * in the part no. B: Black, G: Green, R: Red, S: Blue W: White, Y: Yellow
		2. For square units	Polyarylate □15.4 H4	**AB6Q-B***	**AB6Q-B*PN05**	5	
		3. For rectangular units	Polyarylate W21.4 H4 D15.4	**AB6H-B***	**AB6H-B*PN05**	5	
	Marking plate 	1. For round units	Acrylic ø13.7 H0.8	**AL6M-***	**AL6M-*PN05**	5	Specify the color code in place of * in the part no. B: Black, W: White See page 63 for dimensions and engraving area.
		2. For square units	Acrylic □13.7 H0.8	**AL6Q-***	**AL6Q-*PN05**	5	
		3. For rectangular units	Acrylic W19.7 H0.8 (0.4) D13.7	**AL6H-***	**AL6H-*PN05**	5	
	Diffusion plate	For dome units	Acrylic ø13.6 H2.8	**AL6D-W**	**AL6D-WPN05**	5	White
	Anti-rotation Ring	Standard bezel	Metal (Stainless steel) □17.9 t0.6	**LB9Z-LP1**	**LB9Z-LP1PN10**	10	
	Anti-rotation Ring	Flush bezel	Metal (Stainless steel) 21×8.2×20.6 t0.8	**LB9Z-LP6**	**LB9Z-LP6PN10**	10	
LBW Series	Lens 	1. For round flush units	Polyarylate ø20 H4	**HA9Z-L11***	**HA9Z-L11*PN05**	5	Specify the color code in place of * in the part no. A: Amber, C: Clear, G: Green, R: Red, S: Blue, Y: Yellow Note: Use a clear lens for white (W) or pure white (PW) illumination.
		2. For square flush units	Polyarylate ø20 H4	**HA9Z-L21***	**HA9Z-L21*PN05**	5	
		3. For round extended units	Polyarylate ø20.2 H7.8	**LBW9Z-L12***	**LBW9Z-L12*PN05**	5	Specify the color code in place of * in the part no. A: Amber, G: Green, R: Red, S: Blue, W: clear, Y: Yellow Note: Use a clear lens for white (W) or pure white (PW) illumination.
	Buttons 	1. For round flush units	Polyacetal ø20 H3.2 (L5)	**HA9Z-B11***	**HA9Z-B11*PN05**	5	Specify the color code in place of * in the part no. B: Black, G: Green, R: Red, S: Blue W: White, Y: Yellow
		2. For square flush units	Polyacetal ø20 H3.9 (L5)	**HA9Z-B21***	**HA9Z-B21*PN05**	5	
		3. For round extended units	Polyacetal ø19.8 H7.3 (L9.1)	**HA9Z-B12***	**HA9Z-B12*PN05**	5	
		4. For square extended units	Polyacetal ø19.8 H8 (L9.1)	**HA9Z-B22***	**HA9Z-B22*PN05**	5	
	Marking plate	1. For round flush units	Acrylic ø17 t0.85 (L1.1)	**HA9Z-P1***	**HA9Z-P1*PN05**	5	Specify the color code in place of * in the part no. B: Black, W: White See page 64 for dimensions and engraving area.
		2. For square units	Acrylic □18.4 t0.85	**HA9Z-P2***	**HA9Z-P2*PN05**	5	
	Anti-rotation Ring	LBW series	Metal (Stainless steel) 25×8.2×24.8 t0.8	**LBW9Z-LP6**	**LBW9Z-LP6PN10**	10	
Locking ring		All models	Polyamide ø17.9 H3.9	**LB9Z-LN**	**LB9Z-LNPN10**	10	
Illuminated selector knob operator		Illuminated selector switches	<For operator> Polyarylate Waterproof O-gasket Nitryl rubber ø15.4 H13	**LA1A-F***	**LA1A-F*PN02**		Specify the color code in place of * in the part no. G: green, R: red, W: white

Illuminated Pushbutton
Pilot Light
Pushbutton
Selector
Illuminated Selector
Key Selector
Lever Switch
Buzzer
Accessories
Maintenance Parts
Panel Cut-out
Instructions

LB/LBW Series Maintenance Parts

Maintenance Parts

LB Series Maintenance LED Unit

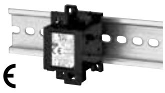
Package Quantity: 1

Shape	Rated Operating Voltage	Part No. (Ordering No.)	∗ Color Code
LED Unit	5V DC	**LB9Z-LED5∗**	A: Amber G: Green PW: Pure White R: Red S: Blue W: White
	12V AC/DC	**LB9Z-LED1∗**	
	24V AC/DC	**LB9Z-LED2∗**	

- All LB/LBW series contain an LED unit.
- Use a pure white (PW) LED unit for yellow (Y) illumination.

Transformer

Package Quantity: 1

Transformer	Primary Voltage	Secondary Voltage	Part No. (Ordering No.)	Applicable Load
For 24V 	AC100/110V	100/110V AC ±10%	**TWR512**	LB9Z-LED2∗ (24V AC/DC LED unit)
	AC200/220V	200/220V AC ±10%	**TWR522**	
	AC400/440V	400/440V AC±10%	**TWR542**	

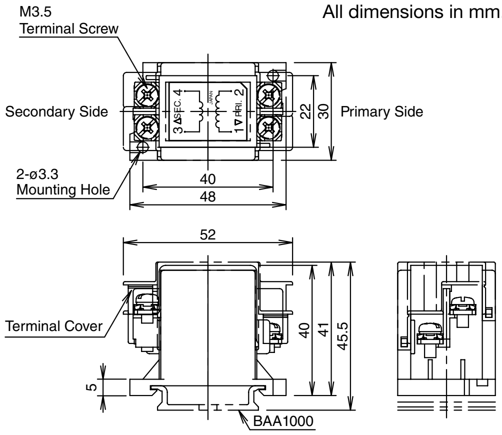
- Terminal cover (TWR-VL3) is supplied as standard.
- Connect one LB9Z-LED2∗ to a transformer.

Specifications

Part No.	TWR5☐2
Operating Voltage	100/110V AC, 200/220V AC, 400/440V AC (50/60Hz)
Current Draw	2.4VA
Rated Insulation Voltage	600V
Insulation Resistance	100 MΩ minimum (500V DC megger)
Operating Temperature	–30 to +60°C (no freezing)
Storage Temperature	–40 to +80°C (no freezing)
Operating Humidity	35 to 85% RH (no condensation)
Vibration Resistance	Damage Limits: 30 Hz, amplitude 1.5 mm Operating extremes: 5 to 55 Hz, amplitude 0.5 mm
Shock Resistance	Damage limits: 1,000 m/s² Operating Extremes: 100 m/s²
Dielectric Strength	2,500V AC, 1 minute
Terminal Screw	M3.5
Applicable Wire	2 mm² maximum, 2 wires maximum
Weight (approx.)	87g

Dimensions

All dimensions in mm.

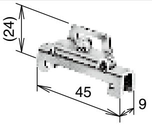
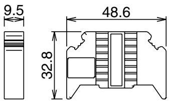


Accessories

35mm DIN Rail

Part No.	Ordering No.	Length	Material	Package Quantity
BAA1000	**BAA1000PN10**	1,000mm	Aluminum (approx. 200g)	10
BAP1000	**BAP1000PN10**	1,000mm	Steel (approx. 320g)	10

End Clip

Part No.	Ordering No.	Applicable DIN Rail	Package Quantity	Dimensions	
BNL6	**BNL6PN10**	BAA1000 BAP1000	10		Approx. 15g Steel (Zinc-plated)
BC9Z-E/NS35N	**BC9Z-E/NS35NPN10**	BAA1000 BAP1000	10		Approx. 15g

Flush Silhouette Switch LB Series
Flush Silhouette Switch LBW Series
ø16mm LB Series Miniature Switches and Pilot Lights

Contents

⚠ Safety Precautions

- **Turn off the power to the LB/LBW series before installation, removal, wiring, maintenance, and inspection. Failure to turn power off may cause electrical shocks or fire hazard.**
- **To avoid burning your hand, use the lamp holder tool when replacing the lamps.**
- **For wiring, use wires of a proper size to meet voltage and current requirements. Solder correctly according to the instructions in "Wiring" and "Notes on Terminal Cover." Improper soldering may cause overheating and create a fire hazard. Also, when using tab terminals, use receptacles of appropriate size.**

Instructions

Wiring

1) Solder the terminals at 350°C within 3 seconds using a 60W soldering iron. Sn-Ag-Cu type is recommended when using leadfree solder. When soldering, do not touch the LB series with the soldering iron. Also ensure that no tensile force is applied to the terminal. Do not bend the terminal or apply excessive force to the terminal.
2) Use non-corrosive liquid flux.

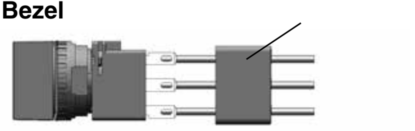
Terminal Cover

Solder/tab terminal

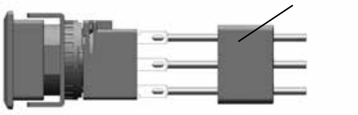
Insert the terminal cover into the contact block with the TOP markings on the contact block and the terminal cover in the same direction.

Note: When wiring, insert the lead wires into the terminal cover holes before soldering.
After wiring, the terminal covers cannot be installed.

Standard Bezel



Flush Bezel



Operating Environment

- Do not use the LB/LBW series where corrosive gases exist or under an environment exceeding the operating temperature and humidity ranges. Otherwise, damages due to contact failure or change of surface color may occur.
- Major parts of the switch are plastic. Scratches or damages may occur when scraped with a sharp object or applied with excessive load or shock. Note that this may cause operation and appearance failure of the operator and bezel.

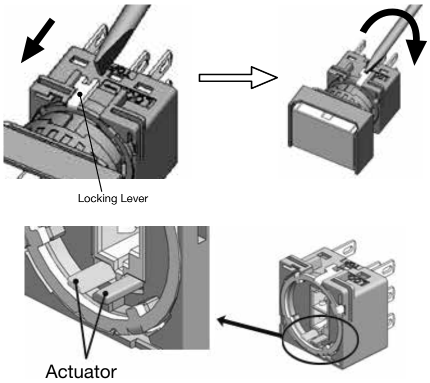
LB/LBW Series Instructions

Instructions

Removing and Installing the Contact Block

1) Turn the locking lever on the contact block in the direction opposite to the arrow on the housing. Then the contact block can be removed.
2) Insert the contact block with the TOP markings on the contact block and the operator placed in the same direction. Then lock the units, turning the locking lever in the direction of the arrow.

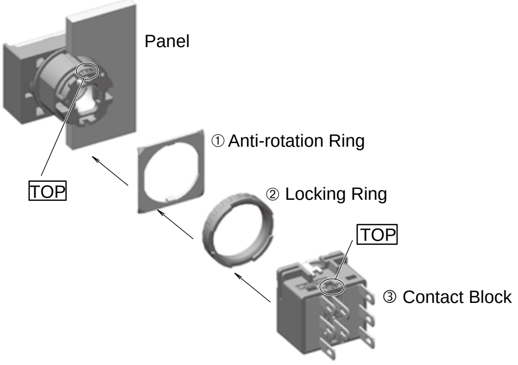
Note: When removing/installing the contact block, or when using the contact block alone, do not apply excessive force on the actuator. Deformed actuator may affect contact operation.



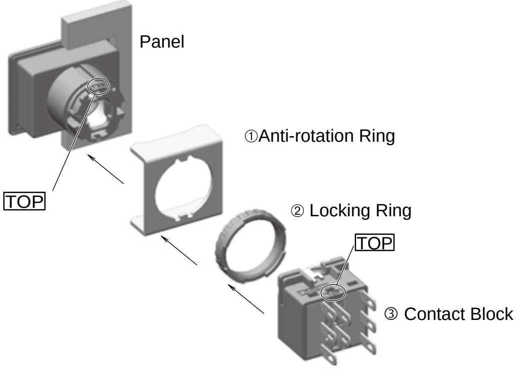
Panel Mounting

Remove the contact block from the operator. Insert the operator into the panel cut-out from the front, then install the contact block to the operator.

(For Standard Bezel)



(For Flush Bezel)



Notes on Mounting

Use the optional ring wrench (MT-001) to mount the operator onto the panel. The recommended tightening torque is 0.5 to 0.7 N·m. Do not use pliers. Excessive tightening will damage the locking ring.

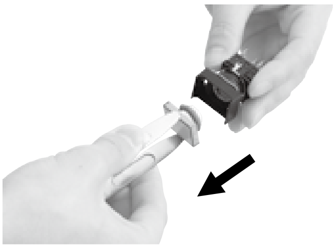
Replacing the Lens and Marking Plate

Removing

[Removing the operator]

Standard Bezel

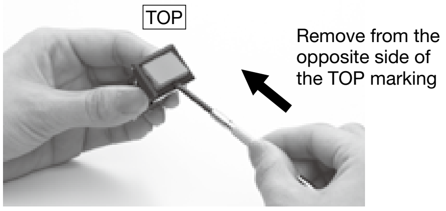
1) From the opposite side of the TOP marking, remove the operator (lens, marking plate, and lens holder) using the optional lens removal tool (MT-101) by gripping the recesses of the color lens.



Flush Bezel

1) From the opposite side of the TOP marking, push the tip (width: 3 mm, thickness: 0.5 mm) of the flat screwdriver to the groove of the color lens and pull out the operator (lens, marking plate, lens holder).

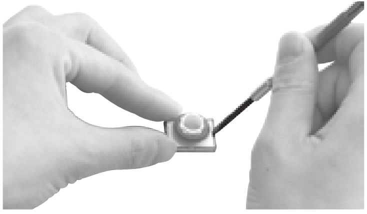
   Note: For metallic bezels, the bezel may be damaged if the screwdriver is inserted from the TOP side or inserted deeply or with force into the groove of the lens.



Remove from the opposite side of the TOP marking

[Removing the Operator]

2) Remove the marking plate by pushing the lens from the rear to disengage the latches between the lens and holder, using the screwdriver as shown below.



Note: The translucent in the lens holder cannot be removed because this filter is sealed to make the unit waterproof and oiltight.

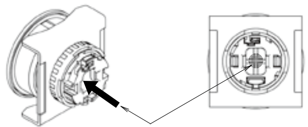
LBW Series Pushbutton (button style)

LBW series pushbuttons (button style, see page 28) can be removed according to the following procedure. LBW series pushbuttons (button style) cannot be removed from the front of the panel.

[Removing the Operator]

1) Detach the operator unit and contact block. (See Removing and Installing the Contact Block at the top of the page.)
2) Remove the button unit (button, button holder) by pushing out the cross-shaped protrusion (white) at the back of the operator with a screwdriver.

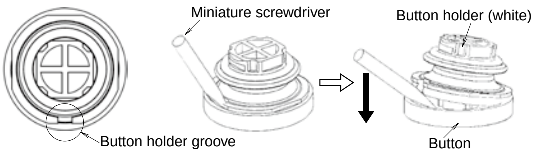
Instructions



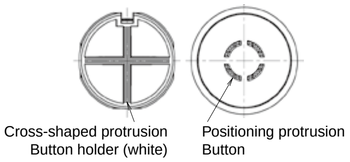
Push out the cross-shaped protrusion (white) from the back of the operator unit.

Removing the Button

The button can be removed by inserting a small screwdriver into the groove of the button holder.


Miniature screwdriver
Button holder (white)
Button holder groove
Button

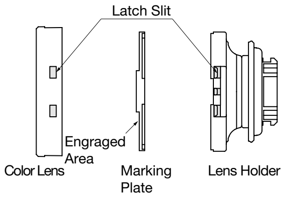
To attach the button to the button holder, align the groove on cross-shaped protrusion with the positioning protrusion on the button and insert securely.


Cross-shaped protrusion
Button holder (white)
Positioning protrusion
Button

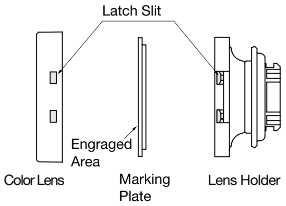
Installing

Insert the marking plate into the color lens, and press the lens onto the lens holder to engage the latches. Pay attention to the orientation of the marking plate.

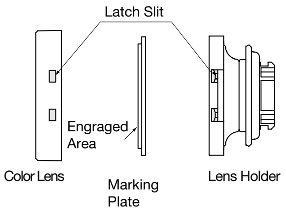
LB/LBW Series Round


Latch Slit
Engraged Area
Color Lens
Marking Plate
Lens Holder

LB Series Square/Rectangular


Latch Slit
Engraged Area
Color Lens
Marking Plate
Lens Holder

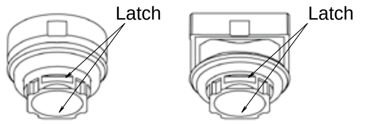
LBW Series Square


Latch Slit
Engraged Area
Color Lens
Marking Plate
Lens Holder

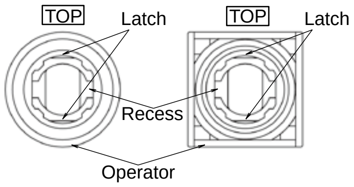
Installing the Lens Unit and Contact Block

To insert the lens unit into the operator, press in the lens unit by making sure that the latch on the operator is aligned with the latch on the lens unit.

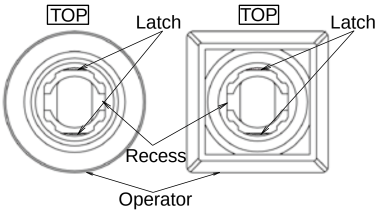
Round Lens Unit **Square Lens Unit**


Latch
Latch

Standard Bezel


TOP
Latch
TOP
Latch
Recess
Operator

Flush Bezel

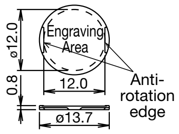

TOP
Latch
TOP
Latch
Recess
Operator

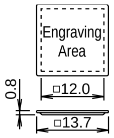
Marking Plates and Films

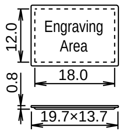
For illuminated pushbuttons, pushbuttons with lens, and pilot lights, legends and symbols can be engraved on the marking plates, or printed film can be inserted under the lens for labelling purposes.

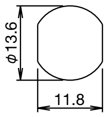
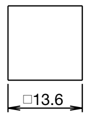
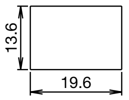
Marking Plate and Marking Film Size

LB Series (flush bezel / standard bezel)

<table>
<tr><th>Lens</th><th>Round</th><th>Square</th><th>Rectangular</th></tr>
<tr><td rowspan="2">Built-in Marking Plate</td><td>
ø12.0
Engraving Area
0.8
12.0
ø13.7
Anti-rotation edge

</td><td>
Engraving Area
0.8
□12.0
□13.7

</td><td>
12.0
Engraving Area
0.8
18.0
19.7×13.7

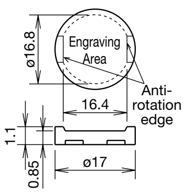
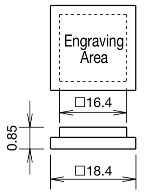
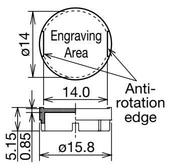
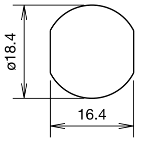
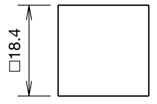
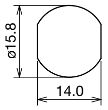
</td></tr>
<tr><td colspan="3">• Engraving must be made on the engraving area within 0.5 mm deep.
• The marking plate is made of white acrylic resin.</td></tr>
<tr><td rowspan="2">Applicable Marking Film</td><td>
</td><td>
</td><td>
</td></tr>
<tr><td colspan="3">• Film thickness: 0.1 mm per film
• Marking film is not included.
• Recommended marking film: Polyester film</td></tr>
</table>

Flush Silhouette LB Series
Flush Silhouette LBW Series
ø16 LB Series
UP Series
Illuminated Pushbutton
Pilot Light
Pushbutton
Selector
Illuminated Selector
Key Selector
Lever Switch
Buzzer
Accessories
Maintenance Parts
Panel Cut-out
Instructions

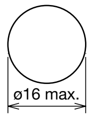
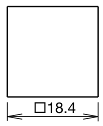
LB/LBW Series Instructions

Instructions

LBW Series

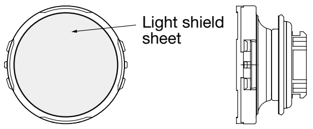
Lens	Round Flush	Square	Round Extended
Built-in Marking Plate	 ø16.8 Engraving Area Anti-rotation edge 16.4 1.1 0.85 ø17	 Engraving Area □16.4 0.85 □18.4	 ø14 Engraving Area Anti-rotation edge 14.0 5.15 0.85 ø15.8
	• Engraving thickness: 0.5 mm max. • The marking plate is made of white acrylic resin.		
Applicable Marking Film			
	• Film thickness: 0.1 mm per 2 films or 0.2 mm per film. • Marking film is not included. • Recommended marking film: Polyester film		

LBW Series (ring-illuminated model)

Lens	Round (Note)	Square
Applicable Marking Film		
	• Film thickness: 0.1 mm max.	

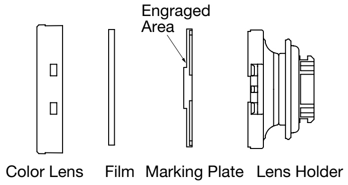
Note: Use a film with adhesive and attach on the light shield sheet. Make sure that the marking film is properly installed and does not protrude from the edge of light shield sheet.

Ring Illuminated Model Lens Holder

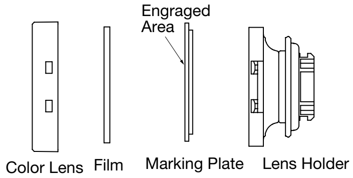

Light shield sheet

Insertion Order of Marking Plate and Film

LB/LBW Series Round


Engraged Area
Color Lens
Film
Marking Plate
Lens Holder

LB/LBW Series Square/Rectangular


Engraged Area
Color Lens
Film
Marking Plate
Lens Holder

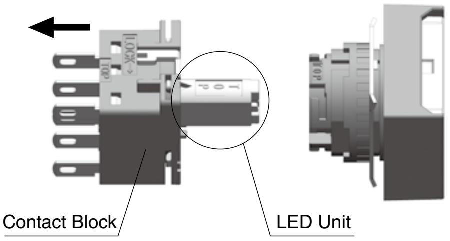
Note: Film is not included.

The marking plate must be engraved on the specified side as shown above. Pay attention to the orientation of the marking plate. When inserting a film, make sure to insert between the color lens and marking plate.

Note: Marking plate is not supplied with ring-illuminated model.

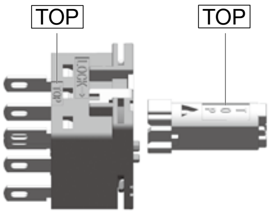
Replacing the LED Unit

The LED unit can be replaced without tools by pulling out the lens unit from the contact block.


Contact Block
LED Unit

Orientation of the LED unit

Insert the LED unit into the contact block with the TOP markings on the contact block and LED unit in the same orientation.



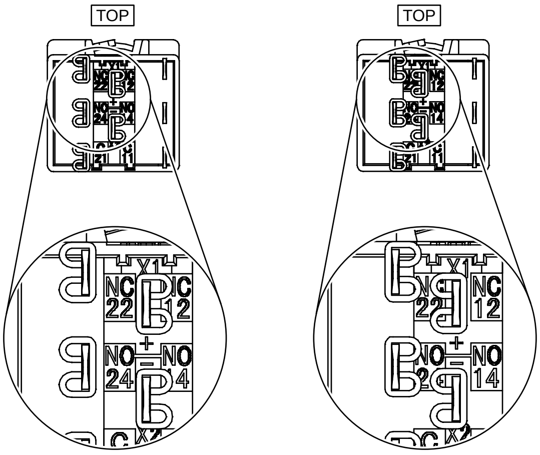
Notes on replacing the LED Unit

When replacing the LED unit, make sure that static electricity is not applied.

Make sure that the LB/LBW series has cooled down before replacing the LED unit. To avoid burn injuries, be careful not to touch the unit while it is still hot.

Notes on Using Quick Connect Terminals

1) Use #110 tab quick connects, 0.5 mm-thick.
2) When connecting the terminals on the left and center, make sure that surfaces of the quick connects face each other. Otherwise, short-circuit may occur.


TOP
TOP
X1
NC 22
C 12
NO 24
NO 14
+
−
C
X2

Correct **Incorrect**

3) Apply only horizontal force against the panel to the tab. The switch may be damaged if a force other than a horizontal force is applied.

Instructions

Installing the Rubber Boot

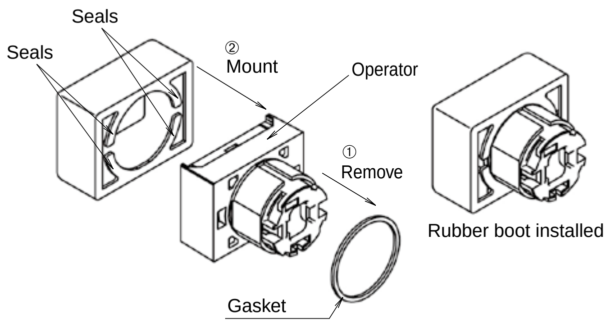
When using in places where the switches are subjected to water splash or an excessive amount of dust, make sure to use the optional rubber boot.
As shown in the drawing below, ① remove the gasket from the operator, and ② attach the rubber boot from the front (button side).

Standard Bezel

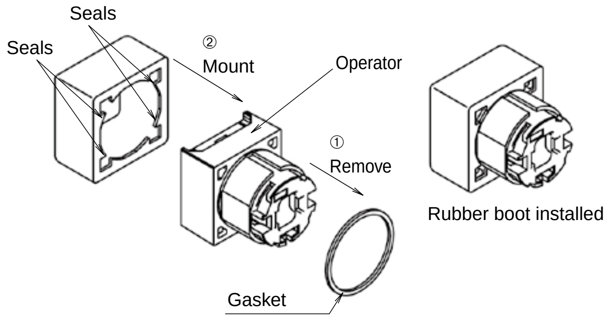
For rectangular and square units, pull out the seals of the rubber boot and place them around the operator sleeve as shown below. Make sure that the seals are not twisted or tucked inside and that the gasket is removed, otherwise waterproof and dustproof characteristics are not ensured.

How to Install the Rubber Boot

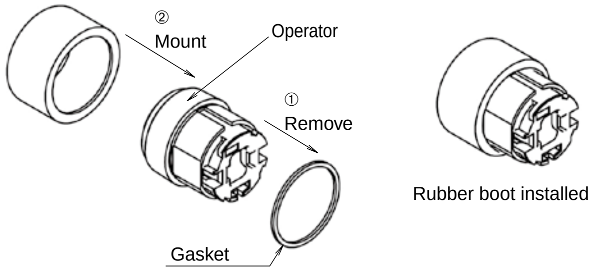
Rectangular


Seals
Seals
② Mount
Operator
① Remove
Rubber boot installed
Gasket

Square


Seals
Seals
② Mount
Operator
① Remove
Rubber boot installed
Gasket

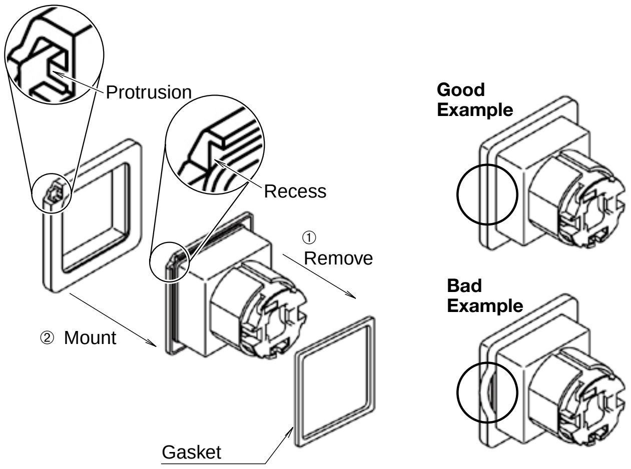
Round


② Mount
Operator
① Remove
Rubber boot installed
Gasket

Flush Bezel

Mount the rubber boot so that the protrusion at the bottom surface of the operator fits with the recess on the operator, placing the rubber boot all around the operator sleeve. Make sure that the protrusion on the rubber boot and the recess on the operator is properly fitted, otherwise, the waterproof and dustproof characteristics are not ensured.

How to Install the Rubber Boot


Protrusion
Recess
① Remove
② Mount
Gasket
Good Example
Bad Example

Note: Install the rubber boot before mounting the unit to the panel.

Maintained Pushbuttons

Do not replace the buttons when the pushbutton is in the maintained position. Replacing the button in the maintained position may damage the internal mechanism. Also, do not remove the contact block with the button in the maintained position. The contact may not operate properly when the contact block is remounted. Make sure to push down fully when using the pushbuttons.

Pushbuttons and Illuminated Pushbuttons with Switch Guard

Do not apply force to the switch guard when the switch guard is not attached to a panel. When opening the switch guard, do not open more than 180°. The hinge may break.

Selector Switches

When turning the operator or key, make sure that they are properly turned to each position.

LB/LBW Series Instructions

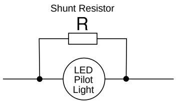
Selector Switches with Key

Observe the following instructions to prevent malfunction or damage.

- Insert the key to the bottom of the key hole.
- Do not remove the key from any key retained position.
- Besides the standard key (key number 0H), six other key numbers are available. Use a key of the matching number with the key cylinder. The standard key does not have a key number indication.
- Keys are available in two types.
  Key numbers 0H (standard), 1H, and 2H are reversible keys which can be inserted in two ways.
  Key numbers 3H, 4H, 5H, and 6H are non-reversible keys. Make sure of correct insertion direction.

Countermeasures against Dim Lighting

Leakage currents through transistors or a contact protection circuit may cause the LED lamp to illuminate dimly even when the output is off.
When the LED lamp is illuminated by a transistor output, take the following measure.

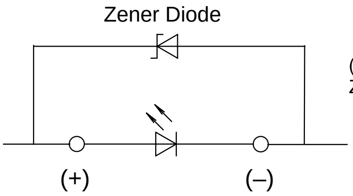


Leakage Current Shunt Resistor Allotment Table (Recommended)

Leakage Current Io	Shunt resistance R			
	Red (R), White (W)		Green (G)	
	Resistance	Rated Power	Resistance	Rated Power
0.1 mA max.	13kΩ	0.25W	18kΩ	0.25W
0.1 to 0.7 mA	2kΩ	0.25W	2.7kΩ	0.25W

Noise

LED elements deteriorate due to extraneous noise, resulting in significant decrease in luminance, hue change, or failure of lighting. When such effects are anticipated, take a protection measure shown below. However, measures may differ according to operating environment and condition



(Zener diode reference value)
Zener voltage: 4.3 to 4.7V

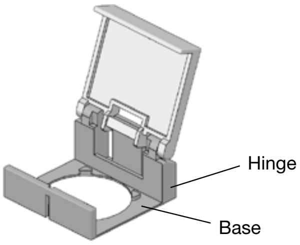
Static Electricity (UP Series)

UP series are delicate products that may be damaged by static electricity Make sure to take measures to prevent static electricity.

Switch Guards

Opening/closing the Switch Guard

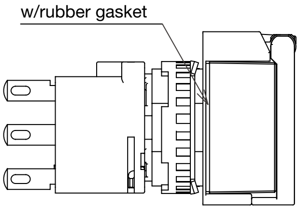
When opening/closing the switch guard while the switch guard is not installed on a panel, make sure to hold the hinge. Holding the base might result in damage. Also do not apply force on the guard in other than open/close directions, otherwise the hinge may be damaged.



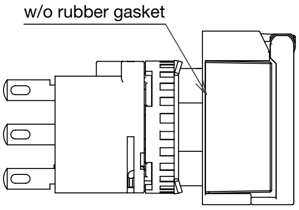
Rubber Gasket when using LB9Z-K2 Switch Guard (remains open) for Round/Square Units

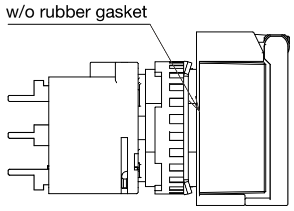
Choose to use or not to use the rubber gasket for the switch referring to the conditions described below. Note that the degree of protection is IP40 with or without the rubber gasket.

- **When the panel thickness is up to 2.8mm**
  Install the switch onto the switch guard with rubber gasket, and mount on the panel.



- **When the panel thickness is 2.8 to 3.2mm**
  Remove the rubber gasket from the switch and install the switch onto the switch guard, and mount on the panel (discard the rubber gasket).



- **Single board mounting**
  Remove the rubber gasket from the switch and install the switch onto the switch guard, and mount on the panel (discard the rubber gasket).