Flush Silhouette Switches

LB/LBW Series

ø16mm

LB series



Projects only 2mm from the panel surface. For sleek and refined style.



• See website for details on approvals and standards.

Thinnest in the industry



Series	page
Flush Silhouette Switches LB Series	B-073
Flush Silhouette Switches LBW Series	B-091
ø16mm LB Series	B-103
UP Series	B-123

Stylish and Functional

IDEC's extensive range of LB/LBW series switches can be used for a wide range of applications.

Flush Silhouette

Flush Silhouette

Projects only 2mm from the panel surface. For sleek and refined style.



LB Series Flush Silhouette Switches Slim 2mm-thick bezels for stylish panels.

LBW Series Flush Silhouette Switches

Smart appearance with large surface for secure operation.





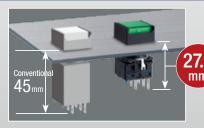


LBW Series Bezel 26/□26mm

Control Unit

ø16mm LB Series Miniature Switches and Pilot Lights

Short body for space-saving installation.



Short Body

Depth of only 27.9mm behind panel. Reduces the size of machines and control

Flush Silhouette & Control Unit

Removable Contact Block /Single Board Mounting

Removable contacts enable easy wiring / Single board mounting for space-saving installation.

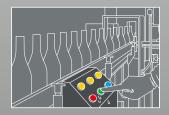






Waterproof

Degree of protection: IP65





UP series has the same depth as LB/LBW series. Mounts on the same panel. (Flush bezel: 34.9mm, standard bezel: 27.9mm)

APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator

Sensors

AUTO-ID

ø16

ø22

ø30 Miniature

Pilot Lights

UP







Black bezel only

return two-way actions available.

Flush Silhouette Switches LB Series

Flush bezel projects only 2 mm from front of panel.

Contact Ratings (See B-120 for approval ratings)

Gold Contact (switch base: blue)

Rated Insulation Voltage	250V		
Rated Thermal Current	3A		
Rated Operating Voltage		30V DC	125V AC
Rated Operating Current Resistive (electrical life: 100,000 operations) Load		0.1A	0.1A
Contact Material		Gold-cla	ad 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 Oper	ating Voltage			30V	125V	250V	
	Electrical	AC	Resistive load	_	5A	5A	
	Life	50/60Hz	Inductive load	_	3A	1.5A	
	50,000	DC	Resistive load	5A	1.1A	_	
	Rated operations Operating Current Electrical Life	perations DC	Inductive load	2A	0.4A	_	
		Electrical	AC	Resistive load	_	5A	3A
Ouricin		50/60Hz	Inductive load	_	3A	1.5A	
	100,000	DC	Resistive load	3A	0.6A	_	
	operations		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-LED5@	LB9Z-LED1@	LB9Z-LED2@	
Current Draw	A, R: 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.]			
		A, G, R, PW, S		
Internal Circuit	X1	X1 OFFICE	LED Chip Resistor	

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



Specifications

opcomo	4110110		
Operating Temperature		-25 to +60°C (no freezing) Illuminated units: -25 to +55°C	
Storage Temperature		-30 to +80°C (no freezing)	
Operating I	_•	45 to 85% RH (no condensation)	
Contact Re		50 mΩ maximum (initial value)	
Insulation F	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/s ² Damage limits: 1,000 m/s ²	
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 I	Protection	IP65 (IEC 60529)	
Terminal Style		Solder/tab terminal #110 PC board terminal	
Weight (approx.)		14g (LB8L-M1T24) 13g (LB8P-1T04) 13g (LB8B-M1T2) 15g (LB8S-2T2) 27g (LB8K-2ST2A) 15g (LB8GL-M1T24) 14g (LB8GB-M1T2)	

^{*1:} Switching frequency 1,800 operations/h.

APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination Controllers

Operator

Sensors

AUTO-ID

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Miniature

Pilot Lights

LBW

UP

^{*2:} Switching frequency 1,200 operations/h.

Control Boxes

Emergency
Stop Switches

Enabling
Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit
Protectors

Power Supplies

LED Illumination

Controllers

Illuminated Pushbuttons

Solder/Tab Terminal Package Quantity:1

Part No. / Shape	LB①L-②1T③④	4	Black Bezel Sq	uare / Black Bezel	Rectangular / Black Bezel	
	Round / Metallic Bezel	Square / Metallic Bezel	Rectangular / Metallic	Bezel Round with	Guard Square with Guard	Rectangular with Guard

		Round / Metallic Bezel	Square / Metallic Bezel	Rectangular / Metallic Bezel	Round with Guard Squa	are with Guard Rectangular with Guard
	① Shape	② Operation	3 Contact	④ LED Operating Voltage	Part No.	* Illumination Color Code
		Momentary	Gold/SPDT	24V AC/DC	LB①L-M1T14*	
	Black bezel	Worneritary	Gold/DPDT	24V A0/D0	LB①L-M1T24*	
	DIACK DEZEI	Maintained	Gold/SPDT	24V AC/DC	LB①L-A1T14*	Specify the color code in place of * in
	Maintaineu	Gold/DPDT	24V AU/DU	LB①L-A1T24*	the Part No.	
		Momentary	Gold/SPDT Gold/DPDT	24V AC/DC	LB①L-M1T14*	
.	Metallic bezel	Williamy		24V AG/DG	LB①L-M1T24*	A: amber
	Metallic bezei	Maintained	Gold/SPDT	24V AC/DC	LB①L-A1T14*	G: green PW: pure white
		Mannameu	Gold/DPDT	24V AU/DU	LB①L-A1T24*	R: red
		Momontory	Gold/SPDT	247/40/00	LB①L-M1T14*	S: blue
	Momentary	Gold/DPDT	24V AC/DC	LB①L-M1T24*	Y: yellow	
	Guard Type	Maintainad	Gold/SPDT	24V AC/DC	LB①L-A1T14*	
	Maintained	Mannameu	Gold/DPDT	24V AU/DU	LB①L-A1T24*]

- Illuminated pushbuttons contain an LED unit. For details on LED units, see B-130.
- 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 B-133 for details on the marking plate and film.
- 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 B-093.

Flush Silhouette

Operator

Sensors

AUTO-ID

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©30 Shape

Miniature Pilot Lights

> CW LW-F

> > LBW

UP Flush Bezel

Part Number Development

LB(1)L-(2)1T(3)(4)(5)*

Round / Black Bezel Square / Black Bezel

Rectangular / Black Bezel

Round / Metallic Bezel

Square / Metallic Bezel

Round with Guard

Square with Guard

Rectangular with Guard

Rectangular / Metallic Bezel

Shape

② Operation

Code	Operation
Α	Maintained
М	Momentary

③ Contacts

Contact
Gold/SPDT
Gold/DPDT
Silver/SPDT
Silver/DPDT

4 LED Operating Voltage

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

5 Others

6

8

6M

7M

8M

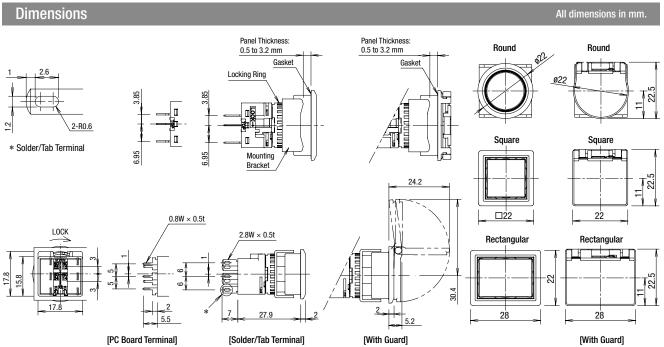
6G

7G

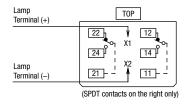
8G

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	_
V	PC Board Terminal (Gold Contact Only)	LB6L-M1T14 <u>V</u> *

[•] Specify the color code in place of * in the table above.



Terminal Arrangement (Bottom View)



Panel Cut-out for Positioning

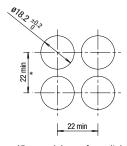
Round (LB6L/LB6ML/LB6GL)

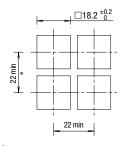


Mounting Hole Layout

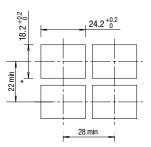
Round (LB6L/LB6ML/LG6GL)

Square (LB7/LB7ML/LB7GL)





Square (LB8L/LB8ML/LB8GL)



* 45 mm minimum for switches with guard

Note: When using rubber boot or terminal cover, see dimensions on B-127 and B-128.

- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

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Miniature

Pilot Lights

LBW

UP

Power Supplies

LED Illumination

Controllers

Operator Interfaces Sensors

AUTO-ID

ø16 ø22 ø30 Miniature

Pilot Lights

Solder/Tab Terminal Package Quantity:1

LB①P-2T034* Shape APEM Black Bezel Black Bezel Rezel Metallic Bezel Black Bezel Metallic Bezel Metallic Bezel Metallic Bezel Control Boxes 3 LED Operating ② Lens Shape ① Shape Part No. * Illumination Color Code Emergency Voltage Stop Switches Enabling 24V AC/DC LB①P-1T04* Black Bezel Switches Specify the color code in place of * in the Part No. Flush Safety Products Metallic Bezel 24V AC/DC LB①P-1T04* A: amber **Explosion Proof** green PW: pure white Black Bezel 24V AC/DC LB6P-2T04* Terminal Blocks R: red S: blue Dome Relays & Sockets Y: yellow Metallic Bezel 24V AC/DC LB6MP-2T04* Circuit Protectors

- Pilot lights contain an LED unit. For maintenance LED units see B-130.
- Legends and symbols can be engraved on a marking plate or film to be inserted under the lens by users for labelling purposes. See B-133 for details.
- 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 B-095.

Part Number Development

LB1)P-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
OIVI	Ticctarigular / Wictaille Bezei

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	

• Round only for dome.

Pilot Lights ④ Others

CW

LW-F

LBW UP Flush Bezel

<u> </u>			
	Code	Specification	Part No. Example
	Blank	Solder/Tab Terminal	_
	٧	PC Board Terminal	LB6P-1T04 <u>V</u> *

• Specify the color code in place of * in the table above.

Control Boxes Emergency Stop Switches Enabling Switches

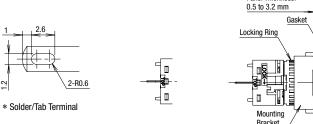
Safety Products **Explosion Proof** Terminal Blocks Relays & Sockets Circuit

Dimensions All dimensions in mm.

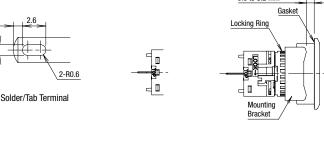
Panel Thickness:

 $2.8W \times 0.5t$

[Flush, Solder/Tab Terminal]

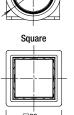


[PC Board Terminal]

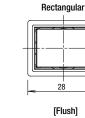


 $0.8W \times 0.5t$

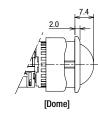












LED Illumination Controllers

Protectors **Power Supplies**

Operator

Interfaces

Sensors AUTO-ID

ø16

ø22

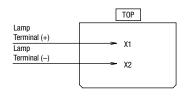
ø30

LBW

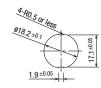
UP Flush Bezel

Miniature Pilot Lights

Terminal Arrangement (Bottom View)



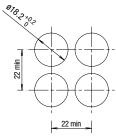
Panel Cut-out for Positioning Round (LB6P/LB6MP)



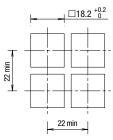
Mounting Hole Layout

LOÇK

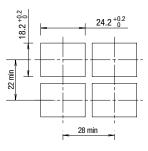
Round (LB6P/LB6MP)







Square (LB8P/LB8MP)



Note: When using rubber boot or terminal cover, see dimensions on B-127 and B-128.

- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

Control Boxes

CW

LW-F

LBW

UP Flush Bezel

Pushbuttons

Solder/Tab Terminal Package Quantity:1

LB1)B-21T34* Shape Square / Metallic Bezel Rectangular / Metallic Bezel Round with Guard Square with Guard Rectangular with Guard

Emergency Stop Switches Enabling 1 Shape Button Style 2 Operation 3 Contact Fold Contact Silver Contact * Color Co	de
Gold Contact Silver Contact	ue
Switches SPDT LB®B-M1T1* LB®B-M1T5* B: black	
Safety Products Momentary DPDT LB\(\text{DB}\)B-M1T2* LB\(\text{DB}\)B-M1T6* G: green	
Button 3PDT LB®B-M1T3* LB®B-M1T7* R: red	
Explosion Proof SPDT LBUB-ATTT* LBUB-ATT5* S: Dide	
Maintained DPDT LB®B-A1T2* LB®B-A1T6* W: white	
Terminal Blocks Black bezel 3PDT LB①B-A1T3* LB①B-A1T7* Y: yellow	
SPDI LB@B-M111L* LB@B-M115L* A: amber	
Relays & Sockets Momentary DPDT LB B-M1T2L* LB B-M1T6L* G: green	
Circuit Protectors Lens 3PDT LB@B-M1T3L* LB@B-M1T7L* R: red	
SPDT LB@B-A1T1L* LB@B-A1T5L* S: blue	
Power Supplies Maintained DPDT LB®B-A1T2L* LB®B-A1T6L* W: white	
3PDT LB@B-A1T3L* LB@B-A1T7L* Y: yellow	
LED Illumination SPDT LB®B-M1T1* LB®B-M1T5* B: black	
Controllers Momentary DPDT LB\(\text{DB}\)B-M1T2* LB\(\text{DB}\)B-M1T6* G: green	
3PDT LR@R-M1T3* LR@R-M1T7* Pr red	
Operator SPDT LB@B-A1T1* LB@B-A1T5* S: blue	
Interfaces Maintained DPDT LB®B-A1T2* LB®B-A1T6* W: white	
Sensors Metallic bezel 3PDT LB①B-A1T3* LB①B-A1T7* Y: yellow	
SPDI LBUB-M111L* LBUB-M115L* A: amher	
AUTO-ID Momentary DPDT LB®B-M1T2L* LB®B-M1T6L* G: green	
3PDT	
Lens SPDT LB@B-A1T1L* LB@B-A1T5L* S: blue	
Maintained DPDT LB®B-A1T2L* LB®B-A1T6L* W: white	
Flush Silhouette 3PDT LB®B-A1T3L* LB®B-A1T7L* Y: yellow	
SPDT LB@B-M1T1* LB@B-M1T5* B; black	
ø16 Momentary DPDT LB①B-M1T2* LB①B-M1T6* G: green	
3PDT LB@B-M1T3* LB@B-M1T7* R: red	
SPDI LB@B-A111* LB@B-A115* S: Diue	
Maintained DPDT LB®B-A1T2* LB®B-A1T6* W: white	
Guard Type Guard Type 3PDT LB①B-A1T7* Y: yellow	
Miniature SPDT LB@B-M1T1L* LB@B-M1T5L* A: amber	
Momentary DPDT LB①B-M1T2L* LB①B-M1T6L* G: green	
Pilot Lights 3PDT LB®B-M1T3L* LB®B-M1T7L* R: red	
SPDT LB®B-A1T1L* LB®B-A1T5L* S: blue	
Maintained DPDT LB®B-A1T2L* LB®B-A1T6L* W: white	
3PDT LB®B-A1T3L* LB®B-A1T7L* Y: yellow	

- The guard opens 180 degrees spring-return.
- 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 B-133 for details on the marking plate and film.
- Black is available for Iens. Black Iens consists of a transparent Iens 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 B-097.

Part Number Development

LB10B-21T34*

S 6.1.4P6		
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

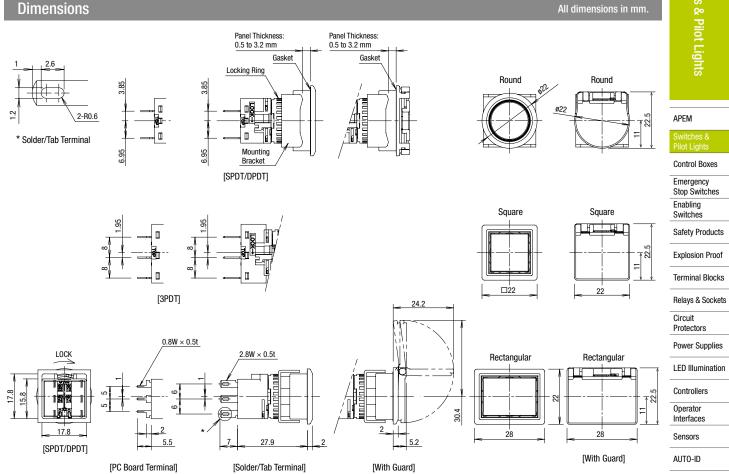
Code Operation Maintained Momentary

3 Contacts

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

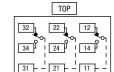
4 Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	_
В	Black Translucent Lens (Lens Only)	LB6B-M1T1L <u>B</u>
V	PC Board Terminal (Gold Contact Only)	LB6B-M1T1 <u>V</u> ∗

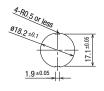


Terminal Arrangement (Bottom View) 3PDT Contacts SPDT/DPDT Contacts

TOP 22 12 24 14 21 11 (SPDT contacts on the right only)



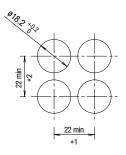
Panel Cut-out for Positioning Round (LB6B/LB6MB/LB6GB)

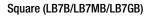


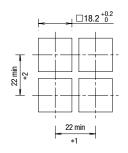
Mounting Hole Layout

[3PDT]

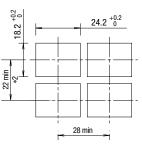
Round (LB6B/LB6MB/LB6GB)







Rectangular (LB8B/LB8MB/LB8GB)



- *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 B-127 and B-128.

- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

ø16

ø22

ø30

LBW

UP Flush Bezel

Miniature

Pilot Lights

Selector Switches

Solder/Tab Terminal Package Quantity:1 Part No. / LB11S-23T45 Shape Knob Operator APEM Round / Black Bezel Square / Black Bezel Rectangular / Metallic Bezel Lever Operator Control Boxes Emergency Enabling Switches Square / Metallic Bezel Rectangular / Metallic Bezel Safety Products Part No. ① Shape 2 Operator Position 3 Contact **Explosion Proof Gold Contact** Silver Contact Terminal Blocks Maintained SPDT LB_①S-2T1 **LB**①S-2T5 LB₃S-2T2 LB₃S-2T6 DPDT Relays & Sockets 2-position 3PDT LB_①S-2T3 LB_①S-2T7 Circuit Protectors Black bezel Maintained DPDT LB_①S-3T2 **LB**①S-3T6 **Power Supplies** 3PDT LB_①S-3T3 **LB**①**S-3T7** 45° 3-position LED Illumination Spring return two-way DPDT **LB**①S-33T2 **LB**①S-33T6 3PDT **LB** ① S-33T3 **LB** ① S-33T7 Controllers Operator Maintained **SPDT** LB₃S-2T1 LB₃S-2T5 Interfaces 900 **DPDT** LB₃S-2T2 **LB** ① S-2T6 2-position Sensors 3PDT LB₃S-2T3 LB₃S-2T7 AUTO-ID Metallic bezel Maintained **DPDT** LB_①S-3T2 **LB**①S-3T6 3PDT LB₃S-3T3 LB₃S-3T7

- 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.

Spring return two-way

- 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 B-119.
- Other bezel sizes available (LBW series). For details, see B-099.

3-position

Part Number Development

LB1S-23T45

LW-F ① Shape

ø16

ø22

ø30

Miniature

Pilot Lights

LBW UP Flush Bezel

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
L R	L

3-position

DPDT

3PDT

LB①S-33T2

LB①S-33T3

LB_①S-33T6

LB_①S-33T7

Operator Position			
3 Maintained	31 Spring return from right	32 Spring return from left	33 Spring return two-way
L C R	L C R	L C R	L_C_R

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-2T1 <u>V</u>

Control Boxes Emergency Stop Switches Enabling Switches Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets Circuit Protectors **Power Supplies** LED Illumination

Controllers

Operator

Interfaces Sensors

AUTO-ID

ø16

ø22

ø30

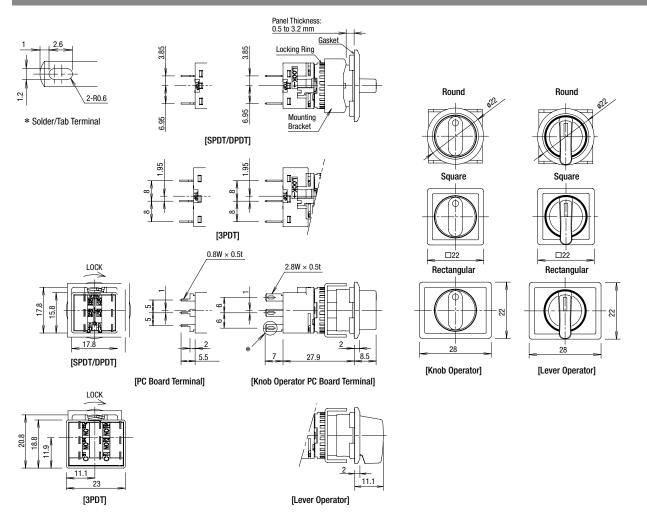
LBW

UP Flush Bezel

Miniature

Pilot Lights

Dimensions All dimensions in mm.



Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts TOP

22

24

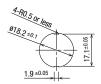
21

3PDT Contacts

TOP 24 14 _ 21 _ 11

Panel Cut-out for Positioning

Round (LB6S/LB6MS)



Mounting Hole Layout

12

14

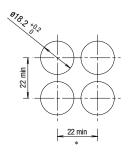
11

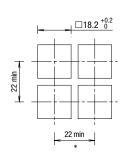
Round (LB6S/LB6MS)

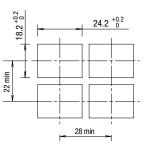
(SPDT contacts on the right only)

Square (LB7S/LB7MS)

Rectangular (LB8S/LB8MS)







*: 23.2 mm minimum for 3PDT

Note: When using rubber boot or terminal cover, see dimensions on B-128.

- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

Control Boxes
Emergency

Enabling

Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit

Protectors

Power Supplies

LED Illumination

Controllers

Operator

Interfaces

Sensors

AUTO-ID

Illuminated Selector Switches

Solder/Tab Terminal Package Quantity:1 Part No. / LB1)F-2T345* Shape Part No. 4 LED Operating * Illumination ① Shape 2 Operator Position ③ Contact Voltage **Gold Contact** Silver Contact Color Code Maintained **SPDT** 24V AC/DC LB①F-2T14* LB①F-2T54* 2-position **DPDT** 24V AC/DC LB①F-2T24* LB①F-2T64* Black bezel Maintained Specify the color 45° code in place of * **DPDT** 24V AC/DC LB①F-3T24* LB①F-3T64* 3-position in the Part No. Maintained SPDT 24V AC/DC green LB①F-2T14* LB①F-2T54* ano red 2-position **DPDT** 24V AC/DC PW: pure white LB①F-2T24* LB①F-2T64*

24V AC/DC

• Illuminated selector switches contain an LED unit. For maintenance LED units see B-130.

Maintained

- 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 B-119.

Part Number Development

45°

3-position

Flush Silhouette

ø30

Miniature

Pilot Lights

CW LW-F

LBW UP Flush Bezel

LB①F-②T③④⑤*

① Shape

Metallic bezel

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

② Operator Position

DPDT

2-position 3-position



③ Contacts

LB①F-3T24*

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

LB①F-3T64*

4 LED Operating Voltage

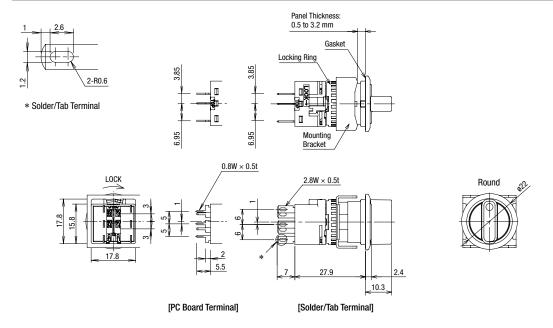
Code	Rated Operating Voltage
1	5V DC
3	12V AC/DC
4	24V AC/DC

5 Others

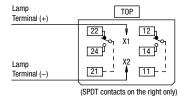
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	_
V	PC Board Terminal (Gold Contact Only)	LB6F-2T14 <u>V</u> *

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

Dimensions All dimensions in mm.

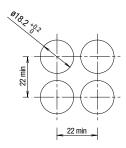


Terminal Arrangement (Bottom View)



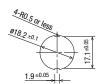
Mounting Hole Layout

Round (LB6F/LB6MF)



Note: When using terminal cover, see dimensions on B-128.

Panel Cut-out for Positioning Round (LB6F/LB6MF)



- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit

Protectors **Power Supplies**

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

ø16

ø22

ø30 Miniature

Pilot Lights

LBW

UP

Control Boxes

Emergency
Stop Switches

Enabling
Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit
Protectors

Power Supplies

LED Illumination

Controllers

Operator

Sensors

AUTO-ID

ø16

ø22

ø30 Miniature Pilot Lights

> CW LW-F

LBW

Flush Bezel

Key Selector Switches

Solder/Tab Terminal Package Quantity:1

						,
Part No. / Shape	LB1K-23T4	5-6				
	Round / Black Bezel	Square / Black Bezel	Rectangular / Black Bezel	Round / Metallic Bezel	Square / Metallic Bezel	Rectangular / Metallic Bezel

ا '	@ Chana	① Shape ② Operator Position		© Key Removable Position		(A) Comboot	Part No.	
.	① Shape	2 Operator	POSITION	S Key Remova	ible Position	④ Contact	Gold Contact	Silver Contact
		000		A: Key removable	L R	SPDT	LB①K-2ST1A	LB①K-2ST5A
		90° 2-position	Maintained	in all positions		DPDT	LB®K-2ST2A	LB①K-2ST6A
.	Black bezel	2 position			<u> </u>	3PDT	LB①K-2ST3A	LB①K-2ST7A
	1	45° 3-position Maintained	Maintained	A: Key removable in all positions	(L) (R)	DPDT	LB①K-3ST2A	LB①K-3ST6A
			Mannameu			3PDT	LB①K-3ST3A	LB①K-3ST7A
		000		A: Key removable	L R	SPDT	LB①K-2ST1A	LB①K-2ST5A
.		90° 2-position	Maintained	in all positions		DPDT	LB①K-2ST2A	LB①K-2ST6A
	Metallic bezel	2-903111011	_	3PDT	LB®K-2ST3A	LB①K-2ST7A		
		45° Maintained	A: Key removable	DPDT	LB®K-3ST2A	LB①K-3ST6A		
		3-position	Manitallieu	in all positions		3PDT	LB®K-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 B-119.
- Other bezel sizes available (LBW series). For details, see B-101.

Part Number Development

LB1K-23T45-6

${\small \textcircled{1}} \ \textbf{Shape}$

6 Round / Black Bezel 7 Square / Black Bezel 8 Rectangular / Black Bezel	
<u> </u>	
8 Rectangular / Black Bezel	
O Hootaligulai / Diack Dozoi	
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

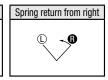
④ Contacts

To 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		



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	
U ®	© 6	● © ®	• © 6	
E: Key removable at right / left	G: Key removable at left	H: Key removable at right		
Ū ®	© 6 B	0 ®		

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

Others

3-position

o pooluon		
Spring return from right	Spring return from left	Spring return two-way
	● ©®	• © 6

 \bullet Key is removable at $\mathbb O, \mathbb O, \mathbb B.$ Key is retained at $\bullet, \bullet,$ and $\bullet.$

6 Key Number

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

• Wave	key only.
--------	-----------

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	_
V	PC Board Terminal (Gold Contact Only)	LB6K-2ST1 <u>V</u> A

Control Boxes

Emergency Stop Switches Enabling Switches Safety Products

Explosion Proof

Terminal Blocks
Relays & Sockets
Circuit
Protectors
Power Supplies

LED Illumination

Controllers

Operator Interfaces Sensors

AUTO-ID

ø16

ø22

ø30

Miniature

Pilot Lights

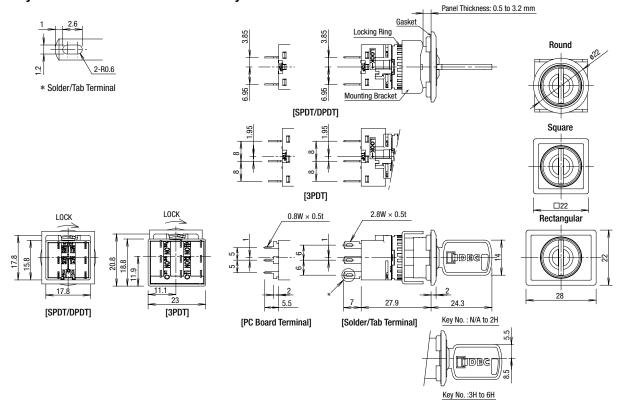
LW-F

LBW UP

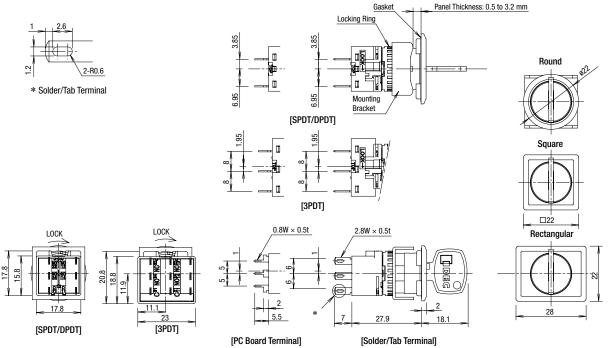
Flush Bezel

Dimensions All dimensions in mm.

Key Selector Switches with Wave Key



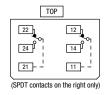
Key Selector Switches with Disc Tumbler Key

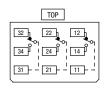


Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts

3PDT Contacts





- For details on mounting hole layout, see B-120.
- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

Lever Switches

Solder/Tab Terminal

Part No. / Shape

APEM Control Boxes Emergency Stop Switches Enabling Switches Safety Products **Explosion Proof** Terminal Blocks Relays & Sockets

Circuit Protectors Power Supplies LED Illumination

Controllers

Operator

Sensors AUTO-ID

	Round / Black Bezel				
Shape		Operator Position	Contact		Part No.
опаро			Contact	Gold Contact	Silver Contact
		Maintained	SPDT	LB6T-2T1	LB6T-2T5
2-position		DPDT	LB6T-2T2	LB6T-2T6	
		_ D	3PDT	LB6T-2T3	LB6T-2T7
Black bezel		Maintained	DPDT	LB6T-3T2	LB6T-3T6
3-position	O manition		3PDT	LB6T-3T3	LB6T-3T7
	Spring return from	DPDT	LB6T-33T2	LB6T-33T6	
		top/bottom C C		LB6T-33T3	LB6T-33T7
PC board termina	ls available for gol	d contacts. Add " V " to the Part No.	,	·	

Package Quantity: 1

- Example: LB6T-2T1V
- For contact operation, see B-119.

ø16

ø22

ø30 Miniature

Pilot Lights

CW

LW-F

LBW UP

Control Boxes Emergency Stop Switches

Enabling Switches Safety Products **Explosion Proof**

Terminal Blocks

Relays & Sockets

Circuit Protectors **Power Supplies** LED Illumination Controllers

Operator Interfaces

Sensors AUTO-ID

ø16 ø22

ø30

LBW

UP

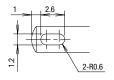
Flush Bezel

Miniature

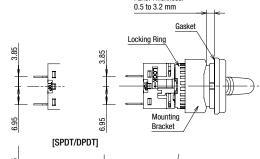
Pilot Lights

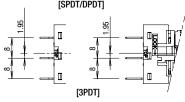
Dimensions All dimensions in mm.

Panel Thickness:

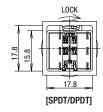


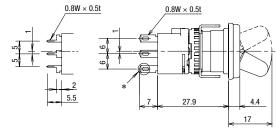
* Solder/Tab Terminal



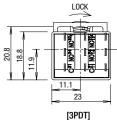


[PC Board Terminal]



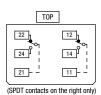




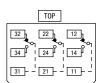


Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts



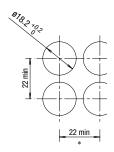
3PDT Contacts



Mounting Hole Layout

Round (LB6T)

[Solder/Tab Terminal]



*: 23.2 mm minimum for 3PDT

Note: When using terminal cover, see dimensions on B-128.

Panel Cut-out for Positioning

Round (LB6T)



- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

Circuit Protectors **Power Supplies** LED Illumination Controllers Operator

Sensors

AUTO-ID

Control Boxes Emergency Enabling Switches Safety Products **Explosion Proof** Terminal Blocks

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/s ² Damage limits:1,000m/s ²
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



- UL, CSA ratngs: Operating voltage 12, 24V DC.
- See website for details on approvals and standards.

Package Quantity: 1

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

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

	Flush Silhouette
	ø16
	ø22
	ø30
	Miniature
-	Pilot Lights
•	
	CW
	IW F

LW-F

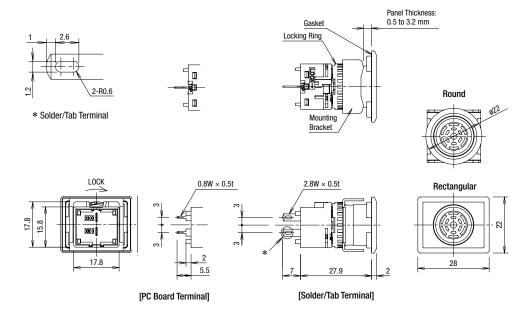
LBW

UP

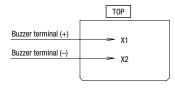
Flush Bezel

B-089

Dimensions All dimensions in mm.



Terminal Arrangement (Bottom View)



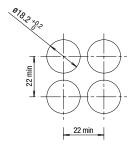
Panel Cut-out for Positioning Round (LB6Z/LB6MZ)

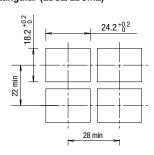


Mounting Hole Layout

Round (LB6Z/LB6MZ)

Rectangular (LB8Z/LB8MZ)





Note: When using rubber boot or terminal cover, see dimensions on B-127 and B-128.

- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

ø16

ø22

ø30

Miniature

Pilot Lights

LBW

UP

Control Boxes

Emergency Stop Switches

> Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

> Sensors AUTO-ID

ø16

ø22

ø30

Miniature

Pilot Lights

CW

LW-F

LB

UP

Flush Bezel

-SERIES | Flush Silhouette Switches

Flush Silhouette Switches



Projects only 2mm from the panel. Removable contact blocks ideal for single board mounting. ø26/□26 bezel size for easy operation.



For sleek and refined style

* Panel cutout (mm)



Illuminated



Illuminated pushbuttons with switch guard available

26mm

Actual Size



Ring-illuminated **Pushbuttons**









Square











Pilot Lights

Pushbuttons Marking plates can be used with lens style







Selector Switches

2-position and 3-position selector switches. Maintained and spring return actions available.









Seven different keys to choose from. Key removable in desired positions.





Stylish Appearance with **Advanced Functions**

Operation status is easily visible due to illumination on the operator.







Illuminated Pushbutton Color Variations





















Bezel Color Variations



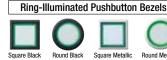
Ring-Illuminated Pushbutton Color Variations















Pushbutton Color Variations

Flush Silhouette Switches LBW Series

Flush bezel projects only 2 mm from front of panel.

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 Resistive (electrical life: 100,000 operations) Load		0.1A 0.1A	
Contact Material		Gold-cla	ad 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 Oper	ating Voltage			30V	125V	250V
	Electrical	AC	Resistive load	_	5A	5A
	Life	50/60Hz	Inductive load	_	3A	1.5A
	50,000	DC	Resistive load	5A	1.1A	_
Rated Operating	operations	DC	Inductive load	2A	0.4A	_
Current	Electrical Life 100,000	AC 50/60Hz	Resistive load	_	5A	3A
Ouricit			Inductive load	_	3A	1.5A
		DC	Resistive load	3A	0.6A	_
	operations		Inductive load	1A	0.22A	I
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-LED5@	LB9Z-LED1@	LB9Z-LED2@
Current Draw	A, R: 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.]		
	A, G, R, PW, S		
Internal Circuit	X10 X2 (+) (-)	X1 OFFICE	LED Chip Zener Diode Resistor

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



Specifications

- p	u		
Operating Temperature		-25 to +60°C (no freezing)	
		Illuminated units: -25 to +55°C	
Storage Temperature		-30 to +80°C (no freezing)	
Operating		45 to 85% RH (no condensation)	
Contact Re		50 mΩ maximum (initial value)	
Insulation	Resistance	100 MΩ minimum (500V DC megger)	
		Between live part and ground:	
		2,000V AC, 1 minute	
	Switch Unit	Between terminals of different poles:	
Dielectric		2,000V AC, 1 minute	
Strength		Between terminals of the same poles: 1,000V AC, 1 minute	
	Illumination	Between live part and ground:	
	Unit	2,000V AC, 1 minute	
		Operating extremes/Damage limits:	
Vibration R	esistance	5 to 55 Hz, amplitude 0.5 mm	
		Operating extremes: 100 m/s ²	
Shock Res	istance	Damage limits: 1,000 m/s ²	
		Momentary: 2,000,000	
Mechanica	I I ife	Maintained: 250,000	
	operations)	Selector switches: 250,000	
(Key selector switches: 250,000	
		Momentary: 50,000 / 100,000 (*1)	
Electrical L	ife	Maintained: 50,000 / 100,000 (*2)	
(minimum	operations)	Selector switches: 50,000 / 100,000 (*2)	
		Key selector switches: 50,000 / 100,000 (*2)	
Degree of	Protection	IP65 (IEC 60529)	
Terminal S	tvla	Solder/tab terminal #110	
Terrilliai Style		PC board terminal	
		16g (LBW7L-M1T24)	
		14g (LBW7P-1T04)	
	,	15g (LBW7B-M1T2)	
Weight (ap	prox.)	17g (LBW7S-2T2)	
		29g (LBW7K-2ST2A)	
		17g (LBW7GL-M1T24)	
		18g (LBW7GB-M1T2)	

*1: Switching frequency 1,800 operations/h.

APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers Operator

Sensors

AUTO-ID

ø16

ø22 ø30

Miniature

Pilot Lights

UP

^{*2:} Switching frequency 1,200 operations/h.

LED Illumination

Controllers

Operator

Sensors

AUTO-ID

ø16

ø22

ø30

CW

LW-F

UP

Flush Bezel

Miniature

Pilot Lights

Guard Type

Illuminated Pushbuttons

Solder/Tab Terminal Package Quantity:1 Part No. LBW1L-23T456* Shape Flush APEM Round / Black Bezel Square / Black Beze Round / Metallic Bezel Square / Metallic Bezel Round with Guard Control Boxes Extended Flush Ring-illuminated Emergency Stop Switches (black bezel is (black bezel is Enabling also available) Switches **⑤ LED Operating** Safety Products ① Shape 2 Operation **4** Contact Part No. * Illumination Color Code Voltage **Explosion Proof** Gold/SPDT LBW1L-M3T14* 24V AC/DC Momentary Gold/DPDT LBW1L-M3T24* Terminal Blocks Black bezel Gold/SPDT LBW①L-A③T14* 24V AC/DC Specify the color code in place Maintained Relays & Sockets Gold/DPDT LBW1L-A3T24* of * in the Part No. Circuit LBW①L-M③T14* Gold/SPDT Protectors Momentary 24V AC/DC amber Gold/DPDT LBW①L-M③T24* **Power Supplies** Metallic bezel areen G: Gold/SPDT LBW1L-A3T14* PW: pure white 24V AC/DC Maintained

- Flush/Extended color code: A (amber), G (green), PW (pure white), R (red), S (blue), Y (yellow)
- Ring-illuminated color code: PW (pure white), W (white), WA (amber), WG (green), WR (red), WS (blue)

Gold/DPDT

Gold/SPDT

Gold/DPDT

Gold/SPDT

Gold/DPDT

- Illuminated pushbuttons contain an LED unit. For details on LED units, see B-130.
- The guard opens 180 degrees spring-return.

Momentary

Maintained

• 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 B-134 for details on the marking plate and film.

24V AC/DC

24V AC/DC

- 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 pushbuttons available. To specify, see Part Number Development below. Pushbuttons with guard is not available.
 Extended pushbutton is available with momentary operation only.
- 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 B-075.

Part Number Development

LBW1L-23T456*

LB 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			
Α	Maintained			
М	Momentary			

3 Operator Style

LBW①L-A③T24*

LBW(1) I - M(3) T14*

LBW①L-M③T24*

LBW①L-A③T14*

LBW1L-A3T24*

R: red S: blue

yellow

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

- Extended style is available only for round (black/metallic bezel) and in momentary operation.
- Guard model is not available for Flush Ring-illuminated types.
 Also, Y (yellow) is not available.

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	_
V	PC Board Terminal (Gold Contact Only)	LBW6L-M1T14 <u>V</u> *

• Specify the color code in place of * in the table above.

Control Boxes

Emergency Stop Switches Enabling Switches Safety Products

Explosion Proof Terminal Blocks Relays & Sockets Circuit Protectors

Power Supplies

LED Illumination

Controllers Operator Interfaces

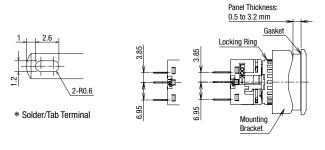
Sensors

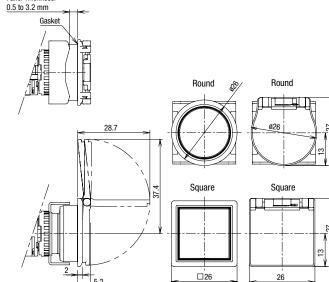
AUTO-ID

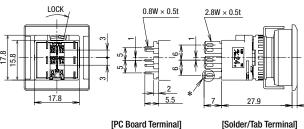
Dimensions All dimensions in mm.

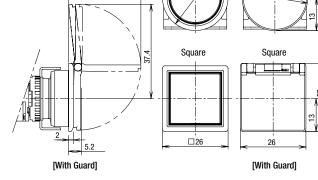
Panel Thickness:

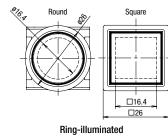
Flush/Ring-illuminated



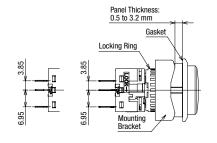


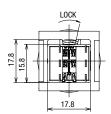


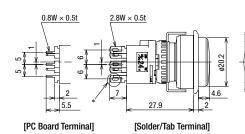




Extended







ø16

ø22

ø30

Miniature

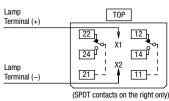
Pilot Lights

LB

UP

Flush Bezel

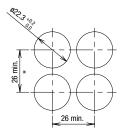
Terminal Arrangement (Bottom View)

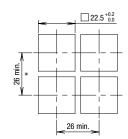


- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

Mounting Hole Layout

Round (LBW6/LBW6M)





Square (LBW7/LBW7M)

*: 53 mm minimum for switches with guard.

Circuit Protectors Power Supplies

LED Illumination

Controllers

Operator

Interfaces

Sensors AUTO-ID

Control Boxes

Emergency
Stop Switches

Enabling
Switches

Safety Products

Explosion Proof

Terminal Blocks

Pilot Lights

Solder/Tab Terminal Package Quantity:1

Part No. / Shape	LBW1P-1T023	*	
	Round / E	Black Bezel Square / B	Black Bezel Round / Metallic Bezel Square / Metallic Bezel
① Shape	③ LED Operating Voltage	Part No.	* Illumination Color Code
Black Bezel	24V AC/DC		Specify the color code in place of * in the Part No.
BIGON BOZOI	24V AC/DC	LBW①P-1T04*	A: amber G: green

- Pilot lights contain an LED unit. For maintenance LED units see B-130.
- Legends and symbols can be engraved on a marking plate or film to be inserted under the lens by users for labelling purposes. See B-134 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.
- \bullet 5V DC and 12V AC/DC LED operating voltages also available.
- Other bezel sizes available (LB series). For details, see B-077.

Part Number Development

LBW1P-1T023*

^{Ø16} ① Shape

ø30 Miniature Pilot Lights

> CW LW-F

> > LB

UP

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

② LED Operating Voltage

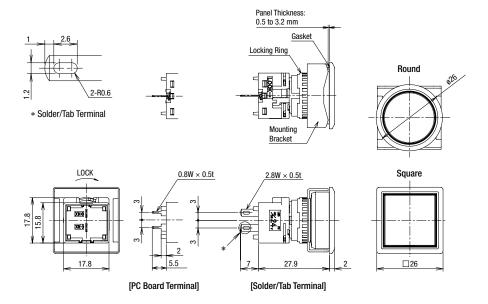
Code	Rated Operating Voltage			
1	5V DC			
3	12V AC/DC			
4	24V AC/DC			

3 Others

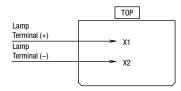
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	_
٧	PC Board Terminal	LBW6P-1T04 <u>V</u> *

 \bullet Specify the color code in place of \ast in the table above.

Dimensions All dimensions in mm.

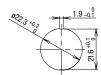


Terminal Arrangement (Bottom View)



Panel Cut-out for Positioning

Round (LBW6P/LBW6MP)

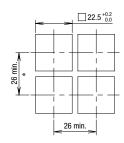


Mounting Hole Layout

Round (LBW6P/LBW6MP)



Square (LBW7P/LBW7MP)



- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks Relays & Sockets

Circuit

Protectors

Power Supplies LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

ø16 ø22

ø30

Miniature

Pilot Lights

LB

UP

Control Boxes

Emergency
Stop Switches

Enabling
Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit
Protectors

Power Supplies

LED Illumination

Controllers

Sensors

ø16

ø22

ø30 Miniature

Pilot Lights

Pushbuttons

Solder/Tab Terminal Package Quantity:1

								(metallic bezel available)			
	① Shape	Button Style	② Operation	Operation 3 Contact Part No.		rt No.	Illumination Oalon Oada				
-	U Shape	Dutton Style	@ Operation	© Comaci	Gold Contact	Silver Contact		* Illumination Color Code			
				SPDT	LBW①B-M1T1*	LBW①B-M1T5*					
			Momentary	DPDT	LBW①B-M1T2*	LBW①B-M1T6*					
-	Black bezel	Button		3PDT	LBW①B-M1T3*	LBW①B-M1T7*					
	DIACK DEZEI	Dutton		SPDT	LBW①B-A1T1*	LBW①B-A1T5*					
			Maintained	DPDT	LBW①B-A1T2*	LBW①B-A1T6*					
-				3PDT	LBW①B-A1T3*	LBW①B-A1T7*		the color code in place			
			Momentary	SPDT	LBW①B-M1T1*	LBW①B-M1T5*	of * in the Part No.	the Part No.			
				DPDT	LBW①B-M1T2*	LBW①B-M1T6*		black			
-	Metallic bezel	Button		3PDT	LBW①B-M1T3*	LBW①B-M1T7*	B:				
	WELAING DEZEI		Dutton	Dutton	Dutton	Sutton	SPDT	LBW①B-A1T1*	LBW①B-A1T5*		green
			Maintained	DPDT	LBW①B-A1T2*	LBW①B-A1T6*	R: S: W:	red blue			
-				3PDT	LBW①B-A1T3*	LBW①B-A1T7*		white			
				SPDT	LBW①B-M1T1*	LBW①B-M1T5*	Y:	yellow			
			Momentary	DPDT	LBW①B-M1T2*	LBW①B-M1T6*					
-	Guard Type	rd Type Button		3PDT	LBW①B-M1T3*	LBW①B-M1T6*					
	dualu Type	Dutton		SPDT	LBW①B-A1T1*	LBW①B-A1T5*					
			Maintained	DPDT	LBW①B-A1T2*	LBW①B-A1T6*					
-				3PDT	LBW①B-A1T3*	LBW①B-A1T7*	1				

- 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 B-134 for details on the marking plate and film.
- Extended pushbuttons available. To specify, see Part Number Development below. Pushbuttons with guard is not available.
 Extended pushbutton is available with momentary operation only.
- Other bezel sizes available (LB series). For details, see B-079.

Part Number Development

LBW1B-231T45*

① Shape

CW	Code	Shape
LW-F	6	Round / Black Bezel
	7	Square / Black Bezel
LB	6M	Round / Metallic Bezel
LBW	7M	Square / Metallic Bezel
	6G	Round with Guard
UP	7G	Square with Guard
Flush Bezel		

② Operation

Code	Operation	
Α	Maintained	
М	Momentary	

3 Operator Style

Code	Operation
1	Flush
2	Extended *

* Extended style is available only for round (black/metallic bezel) and in momentary operation. 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-M1T1 <u>L</u> *
V	PC Board Terminal (Gold Contact Only)	LB6WB-M1T1 <u>V</u> *
VL (Note 1)	PC Board Terminal with Lens (Gold Contact Only)	LB6WB-M1T1 <u>VL</u> *

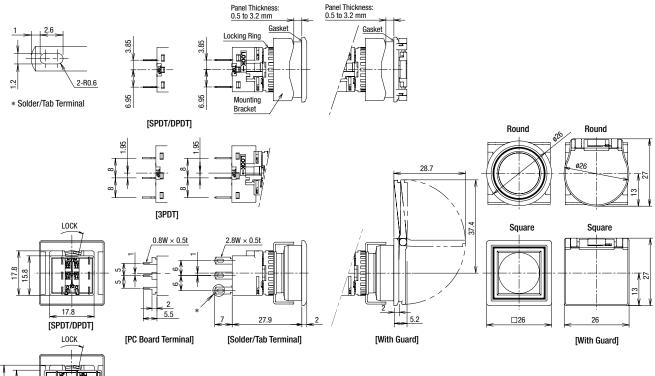
Note 1: Codes L and VL are available with flush operator only.

• Color code (*) for lens:

A (amber), B (translucent lens with black nameplate), G (green), R (red), S (blue), W (white), Y (yellow)

Dimensions All dimensions in mm.

Flush Pushbutton

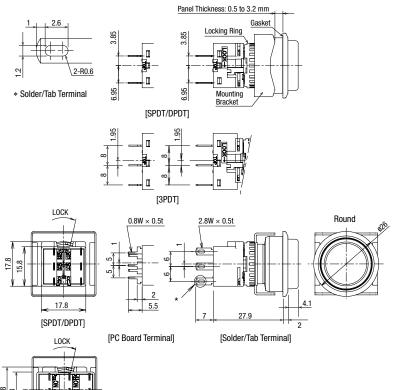


Operator Interfaces

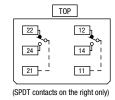
AUTO-ID

Extended Pushbutton

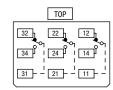
[3PDT]



Terminal Arrangement (Bottom View) SPDT/DPDT Contacts



3PDT Contacts



- For details on mounting hole layout, see B-120.
- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof Terminal Blocks

Relays & Sockets

Circuit Protectors **Power Supplies**

LED Illumination Controllers

Sensors

ø16 ø22

ø30

Miniature

Pilot Lights

LB

UP

Flush Bezel

[3PDT]

Circuit
Protectors

Power Supplies

LED Illumination

Controllers

Operator

Sensors AUTO-ID

ø16

ø22

Miniature

Pilot Lights

CW LW-F

UP

Flush Bezel

Control Boxes
Emergency
Stop Switches
Enabling
Switches
Safety Products
Explosion Proof
Terminal Blocks

Selector Switches

Solder/Tab Terminal Package Quantity:1

Part No. / Shape

LBW 1 S - ② T ③ ④

Round / Black Bezel Square / Black Bezel Round / Metallic Bezel Square / Metallic Bezel

Part No.

·					3 Contact	Part No.	
	① Shape	② Operator Position		Gold Contact		Silver Contact	
. [Maintained	L R	SPDT	LBW①S-2T1	LBW①S-2T5
		90° 2-position			DPDT	LBW①S-2T2	LBW①S-2T6
-		·			3PDT	LBW①S-2T3	LBW①S-2T7
.	Black bezel		Maintained	L C R	DPDT	LBW①S-3T2	LBW①S-3T6
.		45°		\bigvee	3PDT	LBW①S-3T3	LBW①S-3T7
-		3-position	Spring return two-way	Spring return two-way	DPDT	LBW①S-33T2	LBW①S-33T6
				\vee	3PDT	LBW①S-33T3	LBW①S-33T7
. [Maintained	L R	SPDT	LBW①S-2T1	LBW①S-2T5
.		90° 2-position			DPDT	LBW①S-2T2	LBW①S-2T6
					3PDT	LBW①S-2T3	LBW①S-2T7
	Metallic bezel		Maintained	L C R	DPDT	LBW①S-3T2	LBW①S-3T6
		45°		\bigvee	3PDT	LBW①S-3T3	LBW①S-3T7
		3-position	Spring return two-way	L_C_R	DPDT	LBW①S-33T2	LBW①S-33T6
				\mathbf{V}	DPDT	LBW①S-33T3	LBW①S-33T7

- PC board terminals available for gold contacts. To specify, see Part Number Development below.
- For contact operation, see B-119.
- Other bezel sizes available (LB series). For details, see B-081.

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		
L R		

3-position

Operator Position		
3 Maintained	33 Spring return two-way	
L C R	L C R	

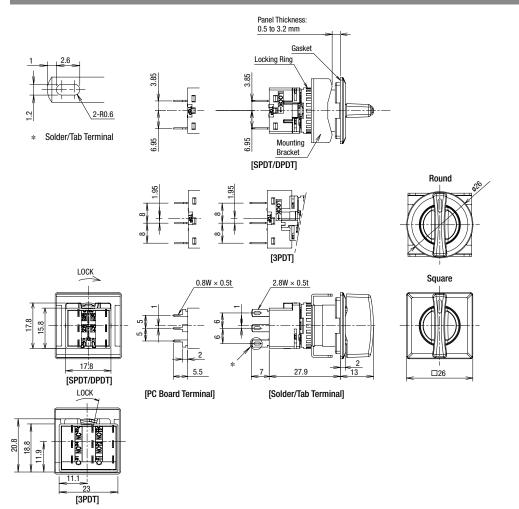
3 Contacts

O 00		
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

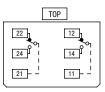
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	_
V	PC Board Terminal (Gold Contact Only)	LBW6S-2T1 <u>V</u>

Dimensions All dimensions in mm.



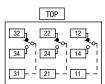
Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts





3PDT Contacts

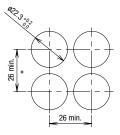


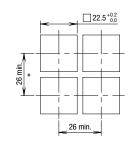
Panel Cut-out for Positioning

Round (LBW6S/LBW6MS)

Mounting Hole Layout

Round (LBW6S/LBW6MS)





Square (LBW7S/LBW7MS)

- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

ø16

ø22

ø30

Miniature

Pilot Lights

LB

UP

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Protectors

Key Selector Switches

Solder/Tab Terminal Package Quantity:1

Part No. / LBW1K-23T45-6 Shape Wave Key Disc Tumbler Key Square / Black Bezel Bound / Black Bezel Round /Metallic Rezel Part No. ① Shape 2 Operator Position **⑤** Contact **5** Key Removable Position **Gold Contact** Silver Contact A: Key removable **SPDT** LBW^①K-2ST1A LBW^①K-2ST5A in all positions Maintained **DPDT** LBW^①K-2ST2A LBW^①K-2ST6A 2-position Black bezel 3PDT LBW^①K-2ST3A LBW^①K-2ST7A A: Key removable **DPDT** LBW^①K-3ST2A LBW^①K-3ST6A 45° Maintained in all positions 3-position 3PDT LBW^①K-3ST3A LBW^①K-3ST7A A: Key removable SPDT LBW^①K-2ST1A LBW^①K-2ST5A

in all positions 90° DPDT Maintained LBW^①K-2ST2A LBW^①K-2ST6A 2-position Metallic bezel 3PDT LBW^①K-2ST3A LBW^①K-2ST7A A: Key removable **DPDT** LBW^①K-3ST2A LBW^①K-3ST6A 45° Maintained in all positions 3-position 3PDT LBW^①K-3ST3A LBW^①K-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 OH), 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 B-119.

Part Number Development

• Other bezel sizes available (LB series). For details, see B-085.

LBW1K-23T45-6 ø22

① Shape ø30

ø16

Miniature

Pilot Lights

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

5 Key Removal Position

The key cannot be removed at the return position.

LW-F

CW

LB

UP

Flush Bezel

Key Removable Position		
A: Key removable in all positions	B: Key removable at left	
(L) (R)	© ®	

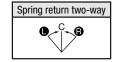
② Operator Position

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

3-position

o position					
Key Removable Position					
A: Key removable in all positions	D: Key removable at center				
$\mathbb{Q} \stackrel{\text{\tiny (C)}}{\longrightarrow} \mathbb{R}$	• © •				

3-position



 Key is removable at ①, ②, ®. Key is retained at **⑤**, **⑥**, and **⑥**.

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			

6 Key Number

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

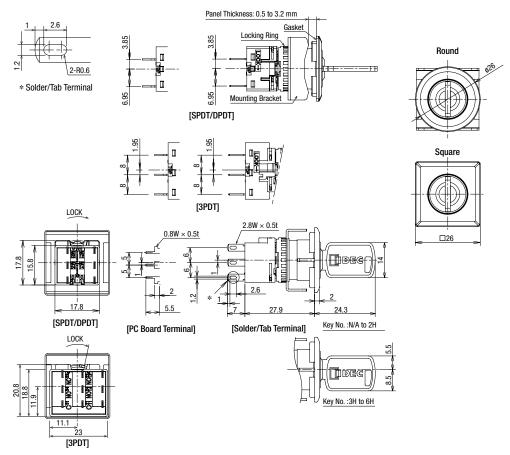
· Wave keys only.

Others

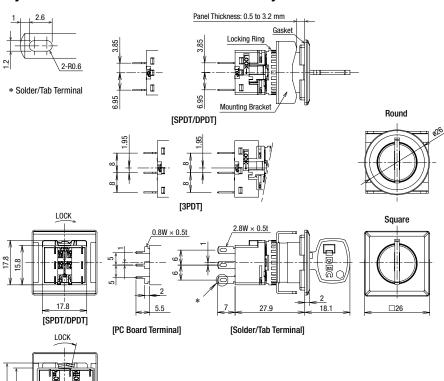
	Code	Specification	Part No. Example
ſ	Blank	Solder/Tab Terminal	_
	٧	PC Board Terminal (Gold Contact Only)	LBW6K-2T1 <u>V</u> A

Dimensions All dimensions in mm.

Key Selector Switches with Wave Key



Key Selector Switches with Disc Tumbler Key

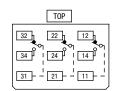


Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts



3PDT Contacts



- · For details on mounting hole layout, see B-120.
- · For details on pc board and circuit design, see B-121.
- · For details on single board mounting, see B-122.

APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit

Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

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Miniature

Pilot Lights

CW

LB

UP

Flush Bezel

[3PDT]

Control Boxes

Emergency Stop Switches

> Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

Flush Silhouette

ø22

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Miniature

Pilot Lights

A6

16 LB-SERIES

Miniature Switches and Pilot Lights (Standard Bezel)



Shortest in the industry (as of February 2011)

Panel depth of only 27.9mm. Removable contact blocks ideal for single board mounting. Protection degree: IP65 (IEC 60529)

For space-saving installation





Illuminated Pushbuttons

Actual Size

27.9_{mm}





Square

□16.2*





Pushbuttons

Marking plates can be used with lens style pushbuttons *Does not light on.









Pilot Lights









Dome **Pilot Lights**







Selector Switches

2- and 3-position selector switches. Maintained and other various spring return actions available.

*Photo: knob operator (lever operator also available) Illuminated selector switches available









Wave Key

Key Selectors

Seven different keys to choose from. Key removable in desired positions.









Buzzers

Steady sound at 80 dB minimum (at 0.1m) IP54 tab terminals, PC board terminal, and IP40 solder terminals available.





Lever Switches

Degree of protection: IP67 Up/down operation. 2- and 3-positions available. For 3-position switches, maintained and return two-way actions available.



Illuminated Pushbutton Color



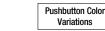




























Ø16mm LB Series Switches and Pilot Lights

Panel depth of only 27.9mm.

Removable contact blocks ideal for single board mounting.

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)	0.1A	0.1A
Contact Material	Gold-cla	ad 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 Insul	ation Voltage	250V				
Rated Oper	ating Voltage	30V	125V	250V		
	Electrical	AC	Resistive load	_	5A	5A
	Life	50/60Hz	Inductive load	_	3A	1.5A
	50,000	DC	Resistive load	5A	1.1A	_
Rated	operations	DC	Inductive load	2A	0.4A	_
Operating Current	Electrical Life 100,000	AC 50/60Hz	Resistive load	_	5A	3A
Ouricit			Inductive load	_	3A	1.5A
		DC	Resistive load	3A	0.6A	_
	operations	DC	Inductive load	1A	0.22A	_
Rated Ther	Rated Thermal Current					
Contact Ma	Contact Material					

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

LED Ratings

Rated Voltage	Voltage 5V DC 12V AC/DC		24V AC/DC			
Voltage Range	Itage Range 5V DC±5%		24V AC/DC ±10%			
LED Part No.	LB9Z-LED5@	LB9Z-LED1@	LB9Z-LED2@			
Current Draw	A, R: 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 red 50% of the initial value when lit at the rated v current) under 25°C environment.]					
		A, G, R, PW, S, W				
Internal Circuit	X10 X2 (-)	X1 OFFICE	LED Chip Resistor			

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



Specifications

		T				
Operating Temperature		-25 to +60°C (no freezing) Illuminated units: -25 to +55°C				
Storage Temperature		-30 to +80°C (no freezing)				
Operating I	Humidity	45 to 85% RH (no condensation)				
Contact Re	sistance	50 mΩ maximum (initial value)				
Insulation F	Resistance	100 MΩ minimum (500V DC megger)				
Dielectric Strength		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 R	esistance	Operating extremes/Damage limits: 5 to 55 Hz, amplitude 0.5 mm				
Shock Resi	stance	Operating extremes: 100 m/s ² Damage limits: 1,000 m/s ²				
Mechanica (minimum	I Life operations)	Momentary: 2,000,000 Maintained: 250,000 Selector switches: 250,000 Key selector switches: 250,000				
Electrical L (minimum	ife 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)				

^{*1:} Switching frequency 1,800 operations/h.

APEM Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination Controllers

Operator Sensors

AUTO-ID

Flush Silhouette

ø22 ø30 Miniature

Pilot Lights

A6

^{*2:} Switching frequency 1,200 operations/h.

Control Boxes

Emergency
Stop Switches

Enabling
Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit
Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces Sensors

AUTO-ID

Illuminated Pushbuttons

Solder/Tab Terminal Package Quantity:1

Part No. / Shape	LB①L-②1T	345*						
					I			
	Roun	nd	Squa	are		Rectangu	lar	Rectangular with 3-sided Barrier
② Oneration	3 Contact	4 LED Operating		Part No.			* Illumination C	olor Code

@ Onereties	© Comtact	4 LED Operating	Part No.		Illiandia akian Oalan Oada
② Operation	3 Contact	Voltage	Gold Contact	Silver Contact	* Illumination Color Code
Momentary	SPDT	24V AC/DC	LB①L-M1T14*	LB①L-M1T54*	Specify the color code in place of * in the Part No.
Womentary	DPDT	24V AU/DU	LB①L-M1T24*	LB①L-M1T64*	A: amber G: green
Maintained	SPDT	24\/ AC/DC	LB①L-A1T14*	LB①L-A1T54*	PW: pure white R: red S: blue
Mamameu	DPDT 24V AC/DC		LB①L-A1T24*	LB①L-A1T64*	Y: yellow

- Illuminated pushbuttons contain an LED unit. For details on LED units, see B-130.
- 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 B-133 for details on the marking plate and film.
- 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*

Round

Square

Rectangular

Flush Silhouette Code

ø16	
ø22	

ø30

Miniature

Pilot Lights

2 Operation

Code	Operation
Α	Maintained
М	Momentary

$\ \ \, \textbf{③ Contacts}$

Contact	
Gold/SPDT	
Gold/DPDT	
Silver/SPDT	
Silver/DPDT	

4 LED Operating Voltage

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

5 Others

2

3

4

Code	Specification	Part No. Example
Blank Solder/Tab Terminal		_
٧	PC Board Terminal (Gold Contact Only)	LB1L-M1T14 <u>V</u> *

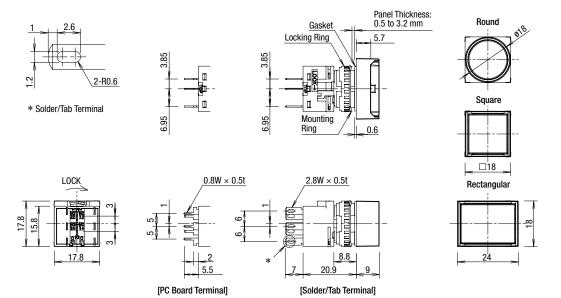
[•] Specify the color code in place of * in the table above

Rectangular with 3-sided Barrier

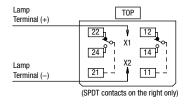
Shape

LB

Dimensions All dimensions in mm.



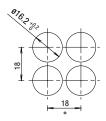
Terminal Arrangement (Bottom View)



Panel Cut-out for Positioning (LB1L/LB2L/LB3L/LB4L)



Mounting Hole Layout (LB1L/LB2L/LB3L/LB4L)



*: 24 mm for rectangular units.

Note: When using rubber boot or terminal cover, see dimensions on B-127 and B-128.

- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

APEM

Control Boxes

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator

Sensors

AUTO-ID

Flush Silhouette

ø22 ø30

Miniature

Pilot Lights

A6

Control Boxes

Emergency
Stop Switches
Enabling
Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets
Circuit

Power Supplies

LED Illumination

Operator Interfaces

AUTO-ID

Flush Silhouette

Protectors

ø16mm LB Series Switches and Pilot Lights

Pilot Lights

Solder/Tab Terminal Package Quantity:1

	Part No. / Shape	LB①P-②T0③④*				
S.		Round	Square	Rectangular	Rectangular with 3-sided Barrier	Dome
S — y S	② Lens Shape	③ LED Operating Voltage	Part No.	* Illum	ination Color Code	
g s s	Flush	24V AC/DC	LB①P-1T04*	Specify the color code in place of A: amber G: green	* in the Part No.	
S S	Dome	24V AC/DC	LB1P-2T04*	PW: pure white R: red S: blue Y: yellow		

- Pilot lights contain an LED unit. For maintenance LED units see B-130.
- Legends and symbols can be engraved on a marking plate or film to be inserted under the lens by users for labelling purposes. See B-133 for details.
- 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

LB1)P-2T034*

① Shape

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

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

• Round only for dome.

4 Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	_
V	PC Board Terminal	LB1P-1T04 <u>V</u> *

 \bullet Specify the color code in place of \ast in the table above

LB A6

ø22

ø30

Miniature Pilot Lights

Control Boxes Emergency Stop Switches

Enabling Switches

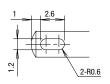
Safety Products **Explosion Proof** Terminal Blocks

Relays & Sockets

Circuit Protectors **Power Supplies** LED Illumination Controllers Operator

Sensors AUTO-ID

Dimensions All dimensions in mm.

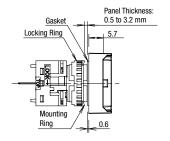


LOÇK



 $0.8W \times 0.5t$

[PC Board Terminal]



2.8W × 0.5t

[Solder/Tab Terminal]

[Dome]







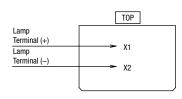












Panel Cut-out for Positioning (LB1P/LB2P/LB3P/LB4P)



ø22

Flush Silhouette

ø30

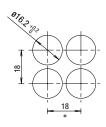
Miniature

Pilot Lights

A6

Mounting Hole Layout

(LB1P/LB2P/LB3P/LB4P)



*: 24 mm for rectangular units.

Note: When using rubber boot or terminal cover, see dimensions on B-127 and B-128.

- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

Circuit
Protectors

Power Supplies

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Control Boxes

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Switches

Safety Products

Explosion Proof

Terminal Blocks

Pushbuttons

Solder/Tab Terminal Package Quantity:1

Part No. / Shape

LB①B-②1T③④*

Round

Square

Rectangular With 3-sided Barrier

Button Style	② Operation	③ Contact	Part No.		Illumination Calan Cada
Bullon Style			Gold Contact	Silver Contact	* Illumination Color Code
		SPDT	LB①B-M1T1*	LB①B-M1T5*	
	Momentary	DPDT	LB①B-M1T2*	LB①B-M1T6*	B: black G: green
Button		3PDT	LB①B-M1T3*	LB①B-M1T7*	R: red
Button	Maintained	SPDT	LB①B-A1T1*	LB①B-A1T5*	S: blue
		DPDT	LB①B-A1T2*	LB①B-A1T6*	W: white Y: yellow
		3PDT	LB①B-A1T3*	LB①B-A1T7*	
		SPDT	LB①B-M1T1L*	LB①B-M1T5L*	
	Momentary	DPDT	LB①B-M1T2L*	LB①B-M1T6L*	A: amber G: green
Long		3PDT	LB①B-M1T3L*	LB①B-M1T7L*	R: red
Lens		SPDT	LB①B-A1T1L*	LB①B-A1T5L*	S: blue
	Maintained	DPDT	LB①B-A1T2L*	LB①B-A1T6L*	W: white Y: yellow
		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 B-133 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.

Flush Silhouette

Part Number Development

LB11B-21T34*

⁰²² ① Shape

ø30	Code	Shape	
Miniature	1	Round	
Williature	2	Square	
Pilot Lights	3	Rectangular	
	4	Rectangular with 3-sided Barrier	

2 Operation

Code	Operation
Α	Maintained
М	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

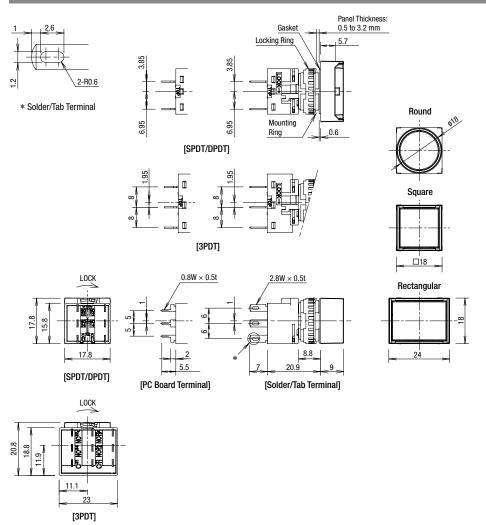
A6

 Code
 Specification
 Part No. Example

 Blank
 Solder/Tab Terminal
 —

 B
 Black Translucent Lens (Lens Only)
 LB1B-M1T1LB

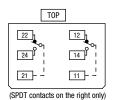
 V
 PC Board Terminal (Gold Contact Only)
 LB1B-M1T1V*

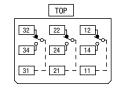


Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts

3PDT Contacts





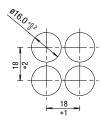
Panel Cut-out for Positioning (LB1B/LB2B/LB3B/LB4B)



- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

Mounting Hole Layout

(LB1B/LB2B/LB3B/LB4B)



- *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 B-127 and B-128.

APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit

Protectors

Power Supplies

LED Illumination Controllers

Operator

Interfaces Sensors

AUTO-ID

Flush Silhouette

ø22 ø30

Miniature

Pilot Lights

A6

Control Boxes

Emergency
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Switches

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Terminal Blocks

Relays & Sockets

Circuit
Protectors

Power Supplies

LED Illumination

Selector Switches

Solder/Tab Terminal Package Quantity:1

Operator Position		3 Contact	Part No.		
l	② Operator Position		© Contact	Gold Contact	Silver Contact
		Maintained	SPDT	LB①S-2T1	LB①S-2T5
	90° 2-position	L R	DPDT	LB①S-2T2	LB①S-2T6
		, and the second	3PDT	LB①S-2T3	LB①S-2T7
45° 3-po:		Maintained C	DPDT	LB①S-3T2	LB①S-3T6
	45°		3PDT	LB①S-3T3	LB①S-3T7
	3-position	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.
- \bullet 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 B-119.

Part Number Development

Shape

Round

Square

Rectangular

LB1S-23T45

Flush Silhouette ① Shape

Controllers

Operator

Interfaces Sensors

AUTO-ID

ø16 ø22

ø30

Miniature

Pilot Lights

A6

③ Operator

Code

2

3

Code	Operator Shape
Blank	Knob
L	Lever

② Operator Position

2-position

Operator Position		
2 Maintained	21 Spring return from right	
L R	L R	

3-position

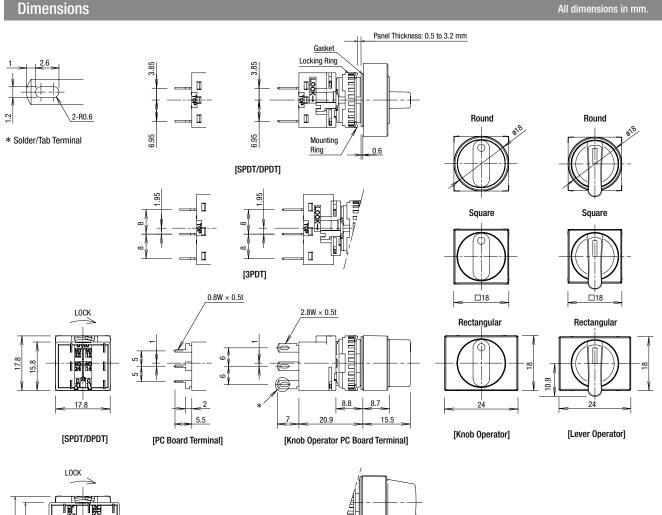
	Operator Position				
3 Maintained	31 Spring return from right	32 Spring return from left	33 Spring return two-way		
L C R	L C R	L_C R	L C R		

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

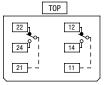
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	_
٧	PC Board Terminal (Gold Contact Only)	LB1S-2T1 <u>V</u>



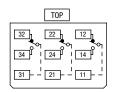
Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts

[3PDT]



(SPDT contacts on the right only)



3PDT Contacts

Panel Cut-out for Positioning (LB1S/LB2S/LB3S)



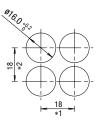
- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

Mounting Hole Layout

(LB1S/LB2S/LB3S)

8.7

[Lever Operator]



- *1: 24 mm for rectangular units, 23.2 mm for 3PDT
- *2: 21 mm for 3PDT

Note: When using terminal cover, see dimensions on B-128.

APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

Flush Silhouette

ø22

ø30

Miniature

Pilot Lights

A6

Control Boxes Emergency

Stop Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

LED Illumination

Controllers

Operator Interfaces Sensors

AUTO-ID

Circuit

Protectors
Power Supplies

3-position

Enabling Switches

Illuminated Selector Switches

Solder/Tab Terminal Package Quantity:1 Part No. / LB①F-②T③④⑤* Shape Rectangular Part No. **4** LED Operating 2 Operator Position ③ Contact * Illumination Color Code Voltage **Gold Contact** Silver Contact Maintained SPDT 24V AC/DC LB①F-2T14* LB①F-2T54* Specify the color code in place 2-position of * in the Part No. DPDT 24V AC/DC LB①F-2T24* LB①F-2T64* G: green R: red PW: pure white Maintained 45°

24V AC/DC

- Illuminated selector switches contain an LED unit. For maintenance LED units see B-130.
- 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.

DPDT

• For contact operation, see B-119.

Part Number Development

LB1)F-2T345*

Shape

Flush Silhouette ① Shape

Code

2

3

ø22

ø30 Miniature

Pilot Lights

- not Eighto

LB	
A6	

2 Operator Position

2-position 3-position

Operator Position		
2 Maintained	3 Maintained	
L R	L C R	

③ Contacts

LB①F-3T24*

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

LB①F-3T64*

4 LED Operating Voltage

Round

Square

Rectangular

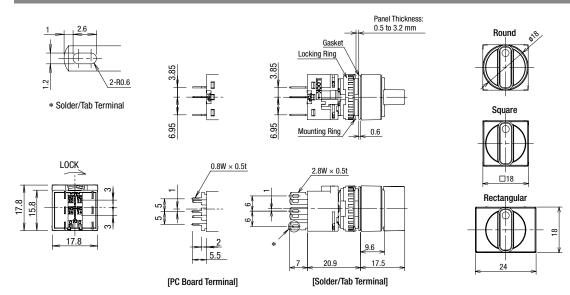
Code	Rated Operating Voltage	
1	5V DC	
3	12V AC/DC	
4	24V AC/DC	

5 Others

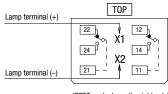
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal —	
V	PC Board Terminal (Gold Contact Only)	LB1F-2T14 <u>V</u> *

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

Dimensions All dimensions in mm.



Terminal Arrangement (Bottom View)



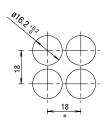
(SPDT contacts on the right only)

Round (LB1F/LB2F/LB3F)



Mounting Hole Layout

Round (LB1F/LB2F/LB3F)



*: 24 mm for rectangular units.

Note: When using terminal cover, see dimensions on ${\hbox{\footnotesize B-128}}$

- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

Panel Cut-out for Positioning

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator

Sensors

AUTO-ID

Flush Silhouette

ø22 ø30

Miniature

Pilot Lights

A6

Circuit Protectors

Power Supplies

LED Illumination

Controllers Operator

Sensors

AUTO-ID

ø22 ø30

Miniature

Pilot Lights

A6

Flush Silhouette

Control Boxes

Emergency
Stop Switches

Enabling
Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Key Selector Switches

Solder/Tab Terminal Package Quantity:1

Part No. / Shape

LB① K-②③ T④⑤ -⑥

Round

Square

Rectangular

Part No.

Part No.

	® Kay Damayahla	Docition	Part No.		ırt No.		
	② Operator Position		⑤ Key Removable	POSITION	Gold Contact Silver Contact		Silver Contact
	•••		A: Key removable in		SPDT	LB①K-2ST1A	LB①K-2ST5A
	90° Maintained	all positions	L R	DPDT LB®K-2ST2A LB®K-2	LB①K-2ST6A		
	2 position			V	3PDT	LB①K-2ST3A	LB①K-2ST7A
	45°	Maintained	A: Key removable in	© ®	DPDT	LB①K-3ST2A	LB①K-3ST6A
	3-position	Mannameu	all positions		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 B-119.

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	

4 Contacts

	Code	Contact
ı	1	Gold/SPDT (90° 2-position only)
١	2	Gold/DPDT
١	3	Gold/3PDT
١	5	Silver/SPDT (90° 2-position only)
ı	6	Silver/DPDT
	7	Silver/3PDT

6 Key Number

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

· Wave key only.

Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	_
٧	PC Board Terminal (Gold Contact Only)	LB1K-2ST1 <u>V</u> A

5 Key Removal Position

2-position

	Key Removable Position									
1	A: Key removable in all positions	B: Key removable at left	C: Key removable at right							
	(L) (R)	Ū R	● ®							



3-position

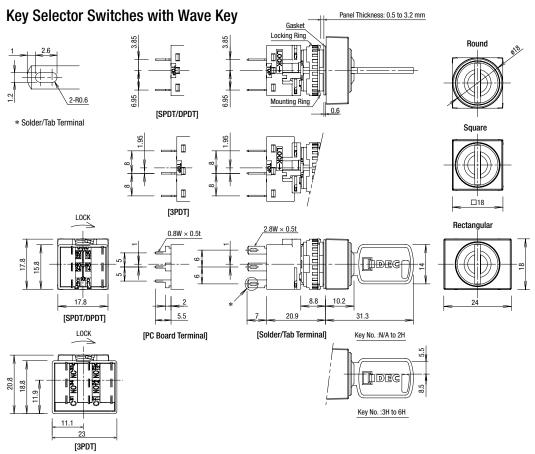
Key Removable Position							
A: Key removable in all positions	B: Key removable at left / center	C: Key removable at center / right	D: Key removable at center				
$\mathbb{Q} \overset{\text{\tiny \tiny \mathbb{C}}}{\longrightarrow} \mathbb{R}$	© B	● ®	• © 6				
E: Key removable at right / left	G: Key removable at left	H: Key removable at right					
	© 6	O B					

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

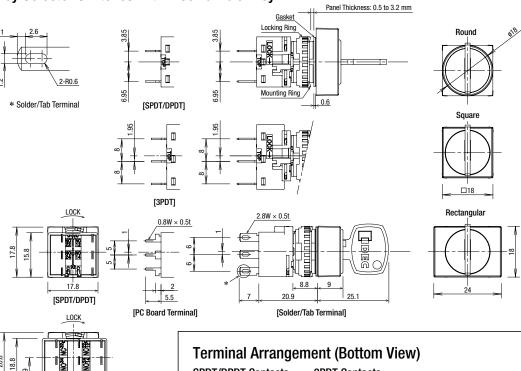
3-position

Spring return from right	Spring return from left	Spring return two-way
© 6	®	• © 6

• Key is removable at \mathbb{Q} , \mathbb{Q} , \mathbb{B} . Key is retained at \mathbb{O} , \mathbb{O} , and \mathbb{O} .



Key Selector Switches with Disc Tumbler Key



APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks Relays & Sockets

Circuit

Protectors **Power Supplies**

LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

Flush Silhouette

ø22

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Miniature

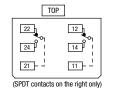
Pilot Lights

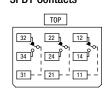
A6

Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts

3PDT Contacts





- For details on mounting hole layout, see B-110.
- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.

11.9

Control Boxes Emergency Stop Switches Enabling Switches Safety Products **Explosion Proof** Terminal Blocks Relays & Sockets Circuit Protectors **Power Supplies**

LED Illumination

Controllers Operator Interfaces Sensors

AUTO-ID

Flush Silhouette

Lever Switches

Solder/Tab Terminal Package Quantity:1

Part No. / Shape

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

Panel Thickness: 0.5 to 3.2 mm

Gasket Locking Ring

П

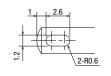
Mounting Ring

[SPDT/DPDT]

- PC board terminals available for gold contacts. Add "V" to the Part No. Example: LB1T-2T1V
- For contact operation, see B-119.

Dimensions

All dimensions in mm.



* Solder/Tab Terminal

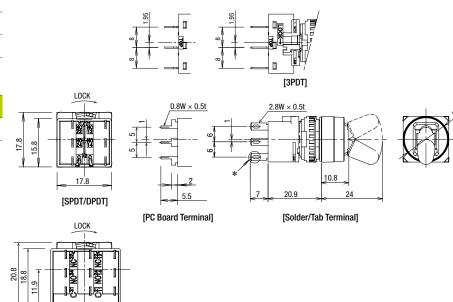
[3PDT]

ø22 ø30

Miniature

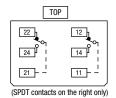
Pilot Lights

A6

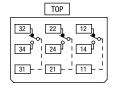


Terminal Arrangement (Bottom View)

SPDT/DPDT Contacts



3PDT Contacts



- For details on mounting hole layout,
- · For details on pc board and circuit design, see B-121.
- · For details on single board mounting, see B-122.

Control Boxes Emergency Stop Switches Enabling Switches Safety Products

Explosion Proof Terminal Blocks Relays & Sockets Circuit Protectors **Power Supplies** LED Illumination

Controllers

Operator Interfaces

Sensors

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)

_				
1	Dielectric Strength	Between live and dead parts: 1,000V AC, 1 minute		
1	Vibration Resistance	Operating extremes/Damage limits: 5 to 55 Hz, amplitude 0.5 mm		
	Shock Resistance	Operating extremes: 100m/s ² Damage limits:1,000m/s ²		
	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		
1	Weight (approx.)	11g (LB3Z-1T0*), 8g (LB3Z-104K)		
1		004 11 000		

• For applicable standards and UL, CSA ratings, see B-089.

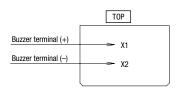
Nama and	Name and Chana		Tarminal Chila	Part No.		
Name and Shape		Operating Voltage	Terminal Style	IP54	IP40	
Rectangular	IP40	24V DC	Solder/tab terminal	LB3Z-1T04	_	
			PC board terminal	LB3Z-1T04V	_	
IP54			Solder terminal	_	LB3Z-104K	

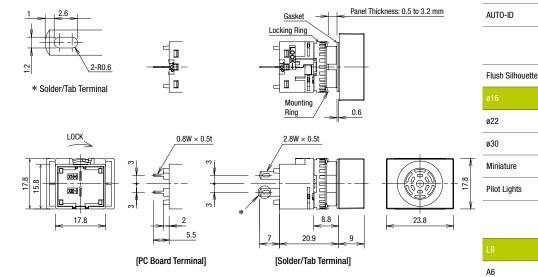
• 12V DC operating voltages also available. Specify "-1T04" in place of "-1T03" in the Part No. Example: LB3Z-1T03

Dimensions

IP54

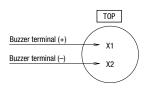
Terminal Arrangement (Bottom View)



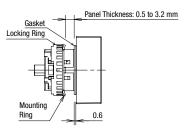


IP40

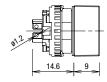
Terminal Arrangement (Bottom View)

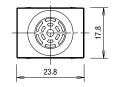


- For details on mounting hole layout, see B-110.
- For details on pc board and circuit design, see B-121.
- For details on single board mounting, see B-122.









All dimensions in mm.



Contact Operation

Selector Switch / Illuminated Selector Switch / Key Selector Switch

Operator Position & Contac						op View)		
Position					Contact		† Center	✓ Right
					SPDT	14 12		14 12
 90° 2-position	L R Maintained	Spring return from right	DPDT	Left Right 14 12 24 22		Left Right 14 12 24 22 4 11 21		
			3		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°	L C R	$L \xrightarrow{C} R$	L C R	$\bigcup_{k=1}^{C} \mathbb{R}^{k}$	DPDT	Left Right 14 12 24 22 11 21	Left Right 14 12 24 22	Left Right 14 12 24 22
3-position	Maintained	Spring return from right	Spring return from left	Spring return two-way	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				Down	Center	Up
				SPDT	14 12		14 12
	90° 2-position	U D Maintained		DPDT	Left Right 14 12 24 22 11 21		Left Right 14 12 24 22
					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°	Maintained U C D Spring return two-way		DPDT	Left Right 14 12 24 22 11 21 21	Left Right 14 12 24 22 11 21	Left Right 14 12 24 22 11 21
	3-position		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	

Switches & Pilot Lights

Control Boxes
Emergency
Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks
Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

Operator

Sensors

AUTO-ID

Flush Silhouette

ø22

ø30

Miniature

Pilot Lights

CW

LW-F

I DW

UP

Flush Bezel

Control Boxes Emergency Stop Switches

Enabling

Switches

Safety Products **Explosion Proof**

Terminal Blocks

Relays & Sockets Circuit Protectors **Power Supplies** LED Illumination

Controllers

Operator

Interfaces Sensors

AUTO-ID

ø22

ø30 Miniature

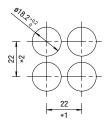
Pilot Lights

Flush Bezel

Mounting Hole Layout / PC Board Drilling Layout

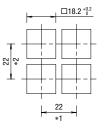
LB Series Flush Bezel

Round (LB6/LB6M)

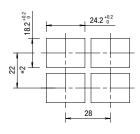


- *1: 23.2 mm for 3PDT contacts
- *2: 45 mm for switches with guard

Square (LB7/LB7M)



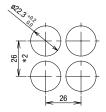
Rectangular (LB8/LB8M)



Note: When using the LB series with a rubber boot or terminal cover, make sure to note the dimensions on B-128.

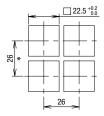
LBW Series Flush Bezel

Round (LBW6/LB6M/LBW6G)



* 53 mm for switches with guard

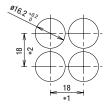
Square (LBW7/LBW7M/LBW7G)



* 53 mm for switches with guard

LB Series Standard Bezel

(LB1/LB2/LB3)



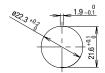
- *1: 24 mm for rectangular type 23.2 mm for 3PDT contacts
- *2: 21 mm for 3PDT contacts

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 Opera	ating Voltage		30V	125V	250V
	AC	Res.	_	3.5 A	2, 3, 5A
Rated Operating	AC	Ind.	_	2A	1.5A
Current	DC	Res.	2, 3, 5A	0.4A	_
33	DC	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
	AC	Res.	_	3A	2, 3, 5A
Rated	AC	Ind.	_	2A	1.5A
Operating Current	DC	Res.	2, 5A	0.4A	_
ourrone	DC	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	AC-12	_	3A	2, 5A
Current	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

Onvoi Oontaot			
Rated Operating Voltage		30V	250V
Rated Operating	AC-12	_	2, 5A
Current	DC-12	2. 5A	_

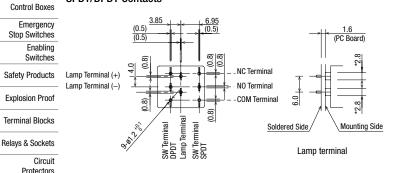
LB/LBW Series

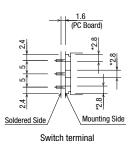
Notes for Designing PC Board and Circuit

All dimensions in mm.

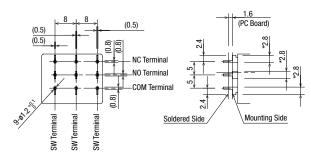
- Use 1.6-mm-thick glass epoxy PC board with drilled holes.
- Design a circuit so that the LB/LBW series can operate within the rated voltage and current range. Make sure that inrush current and voltage do not exceed the rating.
- Minimum applicable load is 5V AC/DC, 1 mA on gold contacts. Applicable 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





3PDT Contacts



Flush Silhouette

ø30 Miniature Pilot Lights

> CW LW-F

Power Supplies

LED Illumination

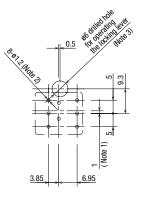
Operator Interfaces

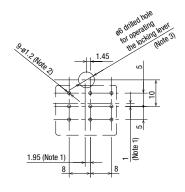
Sensors

AUTO-ID

PC Board Drilling Layout (Bottom View)
SPDT/DPDT Contacts

3PDT Contacts





Flush Bezel

UP

- 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 $\emptyset 1.2$.
- 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.

Control Boxes

Emergency
Stop Switches
Enabling

Switches

Safety Products

Explosion Proof

Terminal Blocks
Relays & Sockets

Circuit

Protectors

Power Supplies

LED Illumination

Controllers

Operator

Sensors
AUTO-ID

ø22

ø30

CW

UP

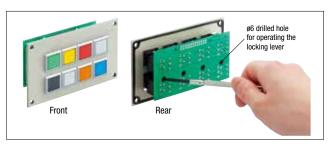
Flush Bezel

Miniature

Pilot Lights

Single Board Mounting

IDEC's LB/LBW Series is available for single board mounting.



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 B-121. Determine the location of the switches so that the locking lever can be operated. See "Removing and Installing the Contact Block" on B-131.

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

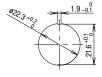
Standard Bezel (LB1/LB2/LB3/LB4)



LB Series Flush Bezel (LB6/LB6M/LB6G)

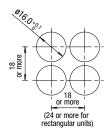


LBW Series Flush Bezel (LBW6/LBW6M/LBW6G)

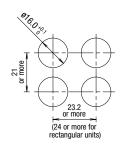


Mounting Hole Layout Standard Bezel (LB1/LB2/LB3/LB4)

SPDT/DPDT Contacts

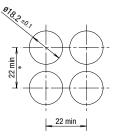


3PDT Contacts

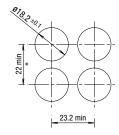


LB Series Flush Bezel

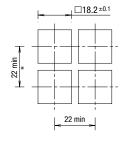
SPDT/DPDT Contacts LB6/LB6M/LB6G

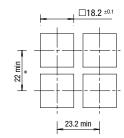


3PDT Contacts

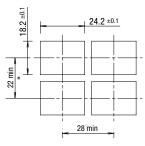


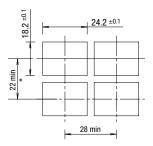
LB7/LB7M/LB7G





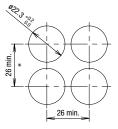
LB8/LB8M/LB8G



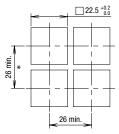


* 45 mm minimum for switches with guard

LBW Series Flush Bezel LBW6/LBW6M/LBW6G



LBW Series Flush Bezela LBW7/LBW7M/LBW7G



* 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 B-123.

Circuit Protectors

Power Supplies

LED Illumination

Controllers

> Sensors AUTO-ID

Control Boxes

Emergency
Stop Switches

Enabling
Switches

Safety Products

Explosion Proof

Terminal Blocks

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

Specifica	แบบร		
Color Code		Red (R), White (W) G (Green)	
Rated Curren	t (I)	7mA	2mA
	Reverse Voltage (V _R)	9V	5V
Maximum Current	Operating Temperature (Topr) -25 to +55°C (no freezing)		ezing)
(Ta: 25°C) 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	Shroud	ID40	Standard Bezel	UP8-89V1*	UP8-89V1*PN10	Specify the color code	10
	With flush bezel	Silloud	IP40		UP8-89V2*PN10	in place of * in the Part No. G: green	10	
ø9 UP9P		Shroud	IP65	Standard bezel Flush bezel	UP9P-99V1*	UP9P-99V1*PN10	R: red W: white	10

• LED cannot be replaced.

Dimensions

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

Flush Silhouette

Miniature

ø30

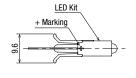
Pilot Lights

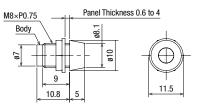
CW	
LW-F	
LB	

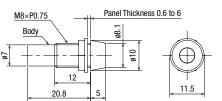
LBW

Flush Bezel

1.5



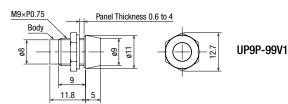




UP8-89V2

UP8-89V1

All dimensions in mm.



Dimensions (L)

[Assembly Drawing]

PC Board (t=1.6)

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

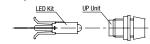
Safety Precautions

- 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.

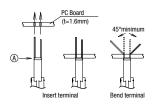
Single Board Mounting

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.

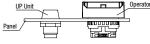


1. Mount the LED kit to the PC board.

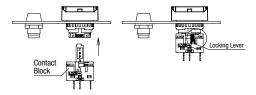


Temporary mounting

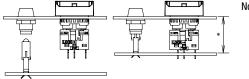
- 1. Note the polarity of the terminals and insert the terminals to the PC board.
- 2. Make sure that part A of the LED kit is pressed tightly to the PC board. Bend the terminals sideways as shown on the left.
- 2. Mount the operator and the UP series pilot lights on to the control panel.



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 surethat the LED kit is inserted into the UP series

* 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	
UP9P-99V1*	Flush bezel	29.9mm	
	Flusii bezei	29.911111	

5. Solder the terminals.

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

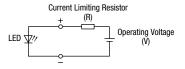
Instructions

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.



Operating Voltage (V) - Forward Voltage (Vf) Resistance (Ω)= 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)

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

Rated Wattage of Resistor = Rated Current \times Operating Voltage \times 2 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 B-136.

Wiring

Solder the terminal at 350°C within 3 seconds using a 60W soldering iron. SnAgCu type lead-free solder is recommended.

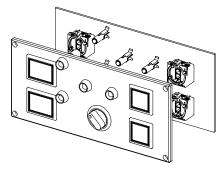
When soldering, do not touch the pilot light housing with the terminal. Do not bend the terminal or apply excessive force to the terminal.

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

APEM

Control Boxes

Emergency Stop Switches Enabling

Safety Products

Switches

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies LED Illumination

Controllers

Operator Interfaces Sensors

AUTO-ID

ø16

ø22

ø30

Miniature

Pilot Lights

LW-F

LB LBW

Flush Bezel

Control Boxes

Emergency
Stop Switches

Enabling
Switches

Safety Products

Explosion Proof

Accessories

Package Quantity:1

		Shape		Specification	Part No.	Ordering No.	Package Quantity	Remarks
Loci	king F	Ring Wrench	ø18.0	Metal (Nickel-plated brass)	MT-001	MT-001	1	Used to tighten the locking ring when installing the units on to the panel.
	Lens Removal Tool 60.0			Stainless Steel	MT-101	MT-101	1	Used to remove the lens or button. (for standard bezels)
	(1	180° Spring return	For round / square units (LB1/LB2)	Guard (Polyacetal)	AL-K6SP	AL-K6SP	1	Degree of protection: IP65 Used to protect pushbuttons and illuminated pushbuttons from inadvertent operation.
	(spring return	Spring return	For rectangular units (LB3/LB4)	Base (Polyarylate)	AL-KH6SP	AL-KH6SP	1	See B-127 for dimensions. With the gasket mounted on the switch, attach the switch guard and mount on the panel.
	Switch Guard (spring return)	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 B-127 for dimensions.
For Standard Bezels	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 B-127 for dimensions. With the gasket mounted on the switch, attach the switch guard and mount on the panel. See B-136 for dimensions. When using for single board mounting, remove the rubber gasket from the switch.
	Swi		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 B-127 for dimensions.
	Rubber Boot 1. For round units (LB1)			LB9Z-D1	LB9Z-D1	1		
2		2	2. For square units (LB2)	Rubber (Transparent silicon rubber)	LB9Z-D2	LB9Z-D2	1	Degree of protection: IP65 See B-127 for dimensions. See B-135 for mounting.
		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 B-127 for dimensions.	
	Моц	unting Hole Plug	Rubber	Nitrile rubber (black)	AL-B6	AL-B6PN05	5	Degree of protection: IP65 See B-127 for dimensions.

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Circuit Protectors
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ED Illumination
Controllers
Operator Interfaces
Sensors
AUTO-ID
ush Silhouette
ø16
ø22
ø30

Miniature Pilot Lights

> CW LW-F

UP Flush Bezel

Accessories

Package Quantity:1						ᅙ						
	Shape		Specification	Part No.	Ordering No.	Package Quantity	Remarks	ilot Lights				
	Rubber Boot	1. For round units (LB6/LB6M)		LB9Z-D6	LB9Z-D6	1						
	2	2. For square units	Rubber	1007.07	L DOZ DZ		Degree of protection: IP65	APEM Switches & Pilot Lights				
		(LB7/LB7M)	(Transparent silicon rubber)	LB9Z-D7	LB9Z-D7	1	See B-128 for dimensions. See B-135 for mounting.	Control Boxes				
For LB Series Flush Bezels	3	3. For rectangular units (LB8/LB8M)		LB9Z-D8	LB9Z-D8	1		Emergency Stop Switches Enabling Switches				
B Series F	Mounting Hole Plug	1. For round units (LB6/LB6M)		LB9Z-BS6*	LB9Z-BS6*	1		Safety Products Explosion Proof				
For		(LDO/LDOW)	[Plug] Polyamide (Black)				" Color and a blank (blank) W (white)	Terminal Blocks				
	2	2. For square units (LB7/LB7M)	[Gasket] Nitrile rubber	LB9Z-BS7*	LB9Z-BS7*	1	* Color code: blank (black), W (white) Degree of protection: IP65 Panel thickness: 0.5 to 3.2 mm See B-128 for dimensions.	Relays & Sockets Circuit Protectors				
	3	3. For rectangular	[Mounting Plate] Stainless Steel					Power Supplies				
	1-	units (LB8/LB8M)		LB9Z-BS8*	LB9Z-BS8*	1		LED Illumination				
		1. For round units	[Plug]	yamide (Black) LBW9Z-BS6*		_	* Color code: blank (black), W (white) Degree of protection: IP65	Controllers Operator				
		(LBW6/LB6W6M)	[Gasket]		LBW9Z-BS6*	1		Interfaces Sensors				
ezels	2	2. For rectangular units (LBW7/LB6W7M)	Nitrile rubber [Mounting Plate] Stainless Steel	LBW9Z-BS7*	LBW9Z-BS7*	1	Panel thickness: 0.5 to 3.2 mm See B-128 for dimensions.	AUTO-ID				
For LBW Series Flush Bezels	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 B-128 for dimensions.	Flush Silhouette ø16				
"	Mounting Hole Plug						Degree of protection: IP65	ø30 Miniature				
	Rubber	nubber Nitrile ru	Kubber	Nitrile rubber	Nitrile rubber LV	NITTIE TUDDET	NITTHE PUDDER	LW9Z-BP1	LW9Z-BP1	1	Tightening torque: 2.0 N·m See B-128 for dimensions.	Pilot Lights
Ter	minal Cover	1. For SPDT/DPDT contacts	PDT	LB9Z-VL2	LB9Z-VL2PN10	10	Con P. 400 for discouring					
		2. For 3PDT	PBT (White)	1.007.1/1.0	L DOZ W ODNIAO	10	See B-128 for dimensions. See B-131 for mounting.	LW-F				
		contacts		LB9Z-VL3	LB9Z-VL3PN10	10		LB				
Key							Specify a key number in place of * in	LBW				
	Reversible key	For key selector switches	Metal	LA9Z-SK-*	LA9Z-SK-*PN02	the Part No. Rlank: Standard key OH (rever	the Part No. Blank: Standard key OH (reversible)	UP				
	Non-reversible key	(wave key)	(zinc nickel-plated)	LA92-SK-**	LAGZ-OK-WI NOZ	L	1H to 2H: Reversible key 3H to 6H: Non-reversible key See B-128 for dimensions.	Flush Bezel				
Key		Factor	NA-1-1 ()									
	-	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

All dimensions in mm.

For LB Series Standard Bezel

Rubber Boot

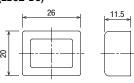
For round units (LB9Z-D1)



For square units (LB9Z-D2)



For rectangular units (LB9Z-D3)



APEM

Control Boxes

Emergency Stop Switches

Enabling Switches Safety Products

Explosion Proof

Terminal Blocks

Circuit Protectors **Power Supplies**

LED Illumination Controllers

> Operator Interfaces Sensors

AUTO-ID

ø22 ø30

Miniature

Pilot Lights

CW LW-F

UP

Flush Bezel



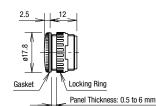


AL-B6

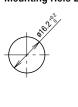
Mounting Hole Layout



AL-BM6

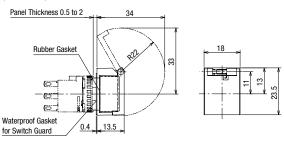


Mounting Hole Layout

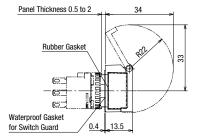


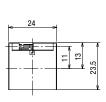
Switch Guard (Spring Return)

For round / square units (AL-K6SP)

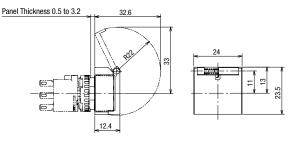


For rectangular units (AL-KH6SP)





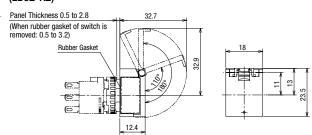
For Single Board Mounting (LA9Z-K3) (Note)



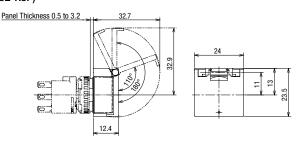
Note: The panel depth is the same for switches with or without switch guards. Both types can be installed on the same PC board.

Switch Guard (Remains Open)

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



For rectangular units (Note) (LB9Z-K3P)



Control Boxes Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks Relays & Sockets Circuit Protectors **Power Supplies**

LED Illumination

Controllers Operator Interfaces Sensors AUTO-ID

ø22 ø30

Miniature

Pilot Lights

CW

UP

Flush Bezel

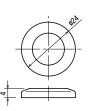
Dimensions for Accessories

All dimensions in mm.

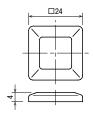
For LB Series Flush Bezel

Rubber Boot

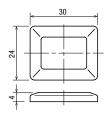
For round units (LB9Z-D6)



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 Mounting Plate Locking Ring

Mounting Hole Layout



Mounting Hole Layout

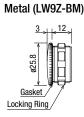


Mounting Hole Layout



For LB Series Flush Bezel

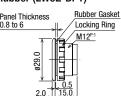
Mounting Hole Plug



Mounting Hole Layout



Rubber (LW9Z-BP1)



Mounting Hole Layout



For round units (LBW9Z-BS6*)



Mounting **Hole Layout**

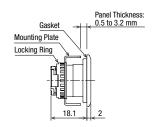


For round units (LBW9Z-BS6*)



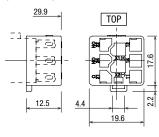
Mounting Hole Layout



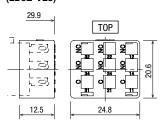


Terminal Cover

For SPDT/DPDT contacts (LB9Z-VL2)

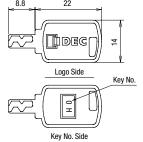


For 3PDT contacts (LB9Z-VL3)

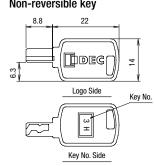


Key (Wave Key)

Reversible key



Non-reversible key



Accessories

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Shape		Material / Dimensions (W×H×D)	Part No.	Ordering No.	Package Quantity	Remarks	
	Lens	1. For round units	Polyarylate ø15.4 H4	AL6M-L*	AL6M-L*PN05	5	
	① ②	2. For square units	Polyarylate	AL6Q-L*	AL6Q-L*PN05	5	Specify the color code in place of * in the part no. A: Amber, C: Clear, G: Green, R: Red,
	3 4	3. For rectangular units	Polyarylate W21.4 H4 D15.4	AL6H-L*	AL6H-L*PN05	5	S: Blue, Y: Yellow Note: Use a clear lens for pure white (PW)
		4. For dome units	Polyarylate ø16 H9.4	AL6D-L*	AL6D-L*PN05	5	illumination.
	Buttons ① ②	1. For round units	Polyarylate ø15.4 H4	AB6M-B*	AB6M-B*PN05	5	
		2. For square units	Polyarylate □15.4 H4	AB6Q-B*	AB6Q-B*PN05	5	Specify the color code in place of * in the part no. B: Black, G: Green, R: Red, S: Blue
	3	For rectangular units	Polyarylate W21.4 H4 D15.4	AB6H-B*	AB6H-B*PN05	5	W: White, Y: Yellow
LB Series	Marking plate ① ②	1. For round units	Acrylic ø13.7 H0.8	AL6M-*	AL6M-*PN05	5	Specify the color code in place of * in the part no.
PB	3	2. For square units	Acrylic □13.7 H0.8	AL6Q-*	AL6Q-*PN05	5	B: Black, W: White
		3. For rectangular units	Acrylic W19.7 H0.8 (0.4) D13.7	AL6H-*	AL6H-*PN05	5	See B-133 for dimensions and engraving area.
	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	
	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,
	1	2. For square flush units	Polyarylate ø20 H4	HA9Z-L21*	HA9Z-L21*PN05	5	S: Blue, Y: Yellow Note: Use a clear lens for pure white (PW) illumination.
	3	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 pure white (PW) illumination.
	Buttons	1. For round flush units	Polyacetal ø20 H3.2 (L5)	HA9Z-B11*	HA9Z-B11*PN05	5	
LBW Series		2. For square flush units	Polyacetal ø20 H3.9 (L5)	HA9Z-B21*	HA9Z-B21*PN05	5	Specify the color code in place of * in the part no.
FBW	3	3. For round extended units	Polyacetal ø19.8 H7.3 (L9.1)	HA9Z-B12*	HA9Z-B12*PN05	5	B: Black, G: Green, R: Red, S: Blue W: White, Y: Yellow
		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.
		2. For square units	Acrylic	HA9Z-P2*	HA9Z-P2*PN05	5	B: Black, W: White See B-134 for dimensions and engraving area.
	Anti-rotation Ring	LBW series	Metal (Stainless steel) 25×8.2×24.8 t0.8	LBW9Z-LP6	LBW9Z-LP6PN10	10	
Lo	cking ring	All models	Polyamide ø17.9 H3.9	LB9Z-LN	LB9Z-LNPN10	10	
	uminated selector knob erator	Illuminated selector switches	<pre><for operator=""> Polyarylate Waterproof O-gasket Nitryl rubber ø15.4 H13</for></pre>	LA1A-F*	LA1A-F*PN02		Specify the color code in place of * in the part no. G: green, R: red, W: white

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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
- MASS - 1000	12V AC/DC	LB9Z-LED1*	PW: Pure White R: Red
- Control of the Cont	24V AC/DC	LB9Z-LED2*	S: Blue W: White

- 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	100/110V AC	100/110V AC ±10%	TWR512	
••••	200/220V AC	200/220V AC ±10%	TWR522	LB9Z-LED2* (24V AC/DC LED unit)
100	400/440V AC	400/440V AC±10%	TWR542	(=)

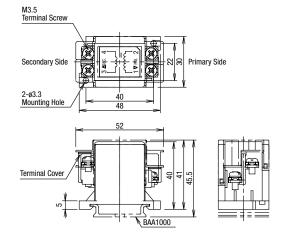
- Terminal cover (TWR-VL3) is supplied as standard.
- Connect one LB9Z-LED2* to a transformer.

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/s ² Operating Extremes: 100 m/s ²
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.



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Miniature

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Flush Bezel

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	Dimensio	ons
BNL6	BNL6PN10	BAA1000 BAP1000	10	(45)	Approx. 15g Steel (Zinc-plated)
BC9Z-E/NS35N	BC9Z-E/NS35NPN10	BAA1000 BAP1000	10	9.5	Approx. 15g

- See H-071 for DIN rail products.
- Use end clip BC9Z-E/N35NPN10 when using 400/440V AC primary voltage transformers.

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.

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LB LBW

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Instructions

Wiring

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

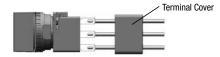
Solder/tab terminal

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

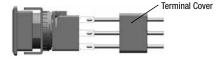
Note: When wiring, insert the lead wires into the terminal cover holes before soldering.

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.
- Adherence of detergent, cutting oil, or special chemicals to the switch may result in operation failures and appearance failures such as change of surface color.

Handling

Contacts (micro switch)

When using NC (normally closed) and NO (normally open) contacts of the same microswitch, avoid connections of different voltages, or connections of different types of power supplies. Failure to observe this instruction may cause a short-circuit.

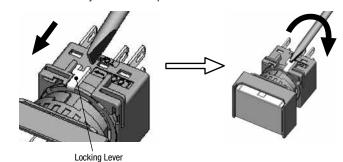
Protection against oil (IP65)

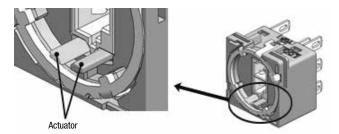
The LB series has been tested according to JIS C 0920: Appendix 1 by using water insoluble cutting oil Class N3, No. 8 (JIS K 2241) to prove that the switches will not be damaged by oil drops or splashes. This may not apply to special types of oils. Contact IDEC for details.

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.



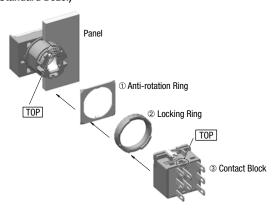


Instructions

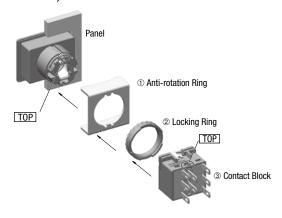
Panel Mounting

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.



[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)

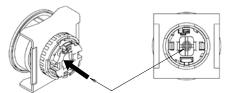
LBW series pushbuttons (button style, see B-097) can be removed according to the following procedure. LBW series pushbuttons (button style) cannot be removed from the front of the panel.

[Removing the Operator]

- 1) Detach the operator unit and contact block. (See Removing and Installing the Contact Block on B-131)
- 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.

LBW Series Illuminated Pushbutton (round extended)

Screw-in lens. The lens can be removed by turning anticlockwise.



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

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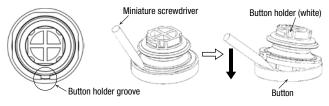
Miniature

Pilot Lights

Instructions

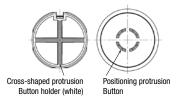
Removing the Button

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



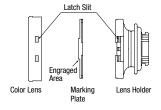
To attach the button to the button holder, align the groove on cross-shaped protrusion with the positioning protrusion on the button and insert securely.

Installing

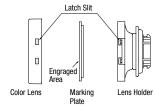


Insert the marking plate into the color lens, and press the lens onto the lens holder to engage the latches. Pay attention to the orientation of the marking plate.

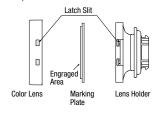
LB/LBW Series Round



LB Series Square/Rectangular



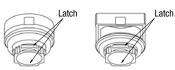
LBW Series Square



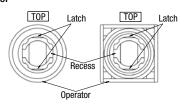
Installing the Lens Unit and Contact Block

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.

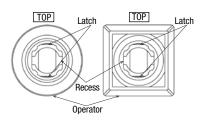
Round Lens Unit Square Lens Unit



Standard Bezel



Flush Bezel



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.

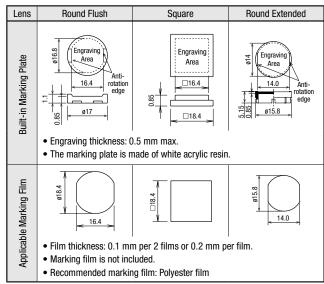
Marking Plate and Marking Film Size

LB Series (flush bezel / standard bezel)

Lens	Round	Square	Rectangular
Built-in Marking Plate		Engraving Area 12.0 13.7 de on the engraving area value of white acrylic resin.	•
Applicable Marking Film	• Film thickness: 0.1 mm • Marking film is not incl • Recommended markin	luded.	© 19.6

Instructions

LBW Series

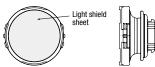


LBW Series (ring-illuminated model)

Lens	Round (Note)	Square	
Applicable Marking Film	• Film thickness: 0.1 mm max.	□18.4 →	

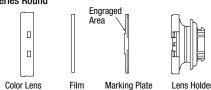
Note: Use a film with adhesive and attach on the light shield sheet. Make sure that the marking film is properly installed and does not protrude from the edge of light shield sheet.

Ring Illuminated Model Lens Holder

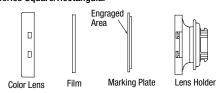


Insertion Order of Marking Plate and Film





LB/LBW Series Square/Rectangular



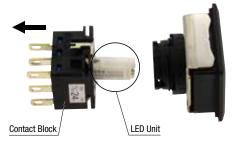
Note: Film is not included.

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.

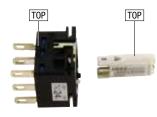
Replacing the LED Unit

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



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.



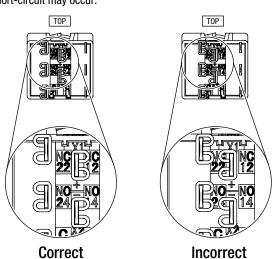
Notes on replacing the LED Unit

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.

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.



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. APEM

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Installing the Rubber Boot

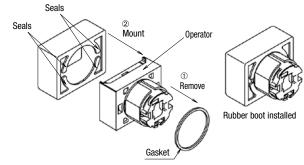
When using in places where the switches are subjected to water splash or an excessive amount of dust, make sure to use the optional rubber hoot.

As shown in the drawing below, ① remove the gasket from the operator, and ② attach the rubber boot from the front (button side).

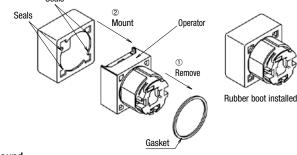
Standard Bezel

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



Square



Operator

1

Remove

Rubber boot installed

Mount

Round

Miniature Pilot Lights

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CW

LW-F

LBW

UP

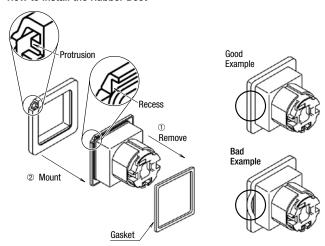
Flush Bezel

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



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.

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.

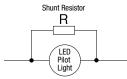
Key numbers 3H, 4H, 5H, and 6H are non-reversible keys. Make sure of correct insertion direction.

Instructions

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

When the LED lamp is illuminated by a transistor output, take the following measure.

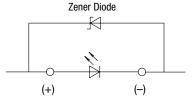


Leakage Current Shunt Resistor Allotment Table (Recommended)

	Shunt resistance R				
Leakage Current Io	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

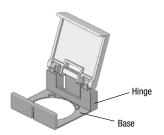
Static Electricity (UP Series)

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.

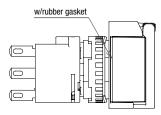


Rubber Gasket when using LB9Z-K2 Switch Guard (remains open) for Round/Square Units

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.

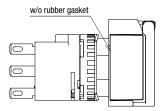
• When the panel thickness is up to 2.8mm

Install the switch onto the switch guard with rubber gasket, and mount on the panel.



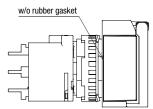
. When the panel thickness is 2.8 to 3.2mm

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).



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