Flush Silhouette Switches Thinnest in the industry LB/LBW Series ø16mm LB Series [Shape] [Contact Rating] Removable **3**A Contact Block [Operating Stroke] [Action] Projects only 2mm from the panel surface. For sleek and refined style. 3 Light mm Я @ Д ( € @ • See website for details on approvals and standards. Series page **Flush Silhouette Switches** B-073 LB Series Flush Silhouette Switches B-091 **LBW Series** ø16mm LB Series B-103 **UP Series** B-123

#### APEM Switches

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

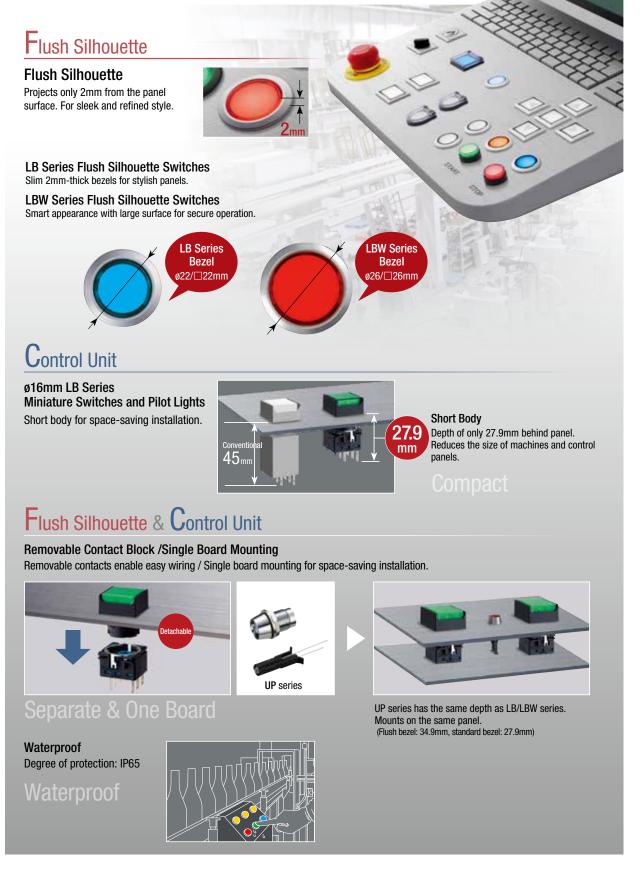
ø16
ø22
ø30
Miniature
Pilot Lights
CW
LW-F
LB
IBW

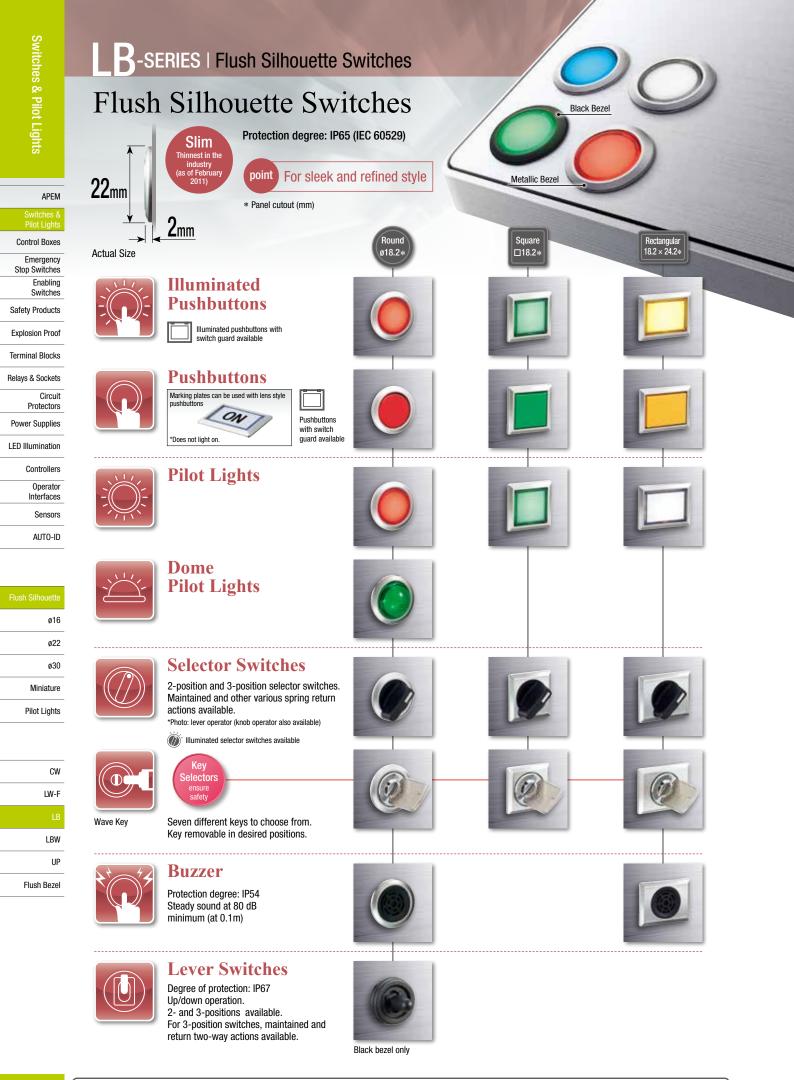
ΠP

Flush Bezel

# **Stylish and Functional**

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





For more information, visit http://eu.idec.com

#### Flush bezel projects only 2 mm from front of panel.

Contact F	Ratings	(See B-120 fc	or approval	ratings)
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#### Gold Contact (switch base: blue)

Rated Insulation Voltage		25	OV	
Rated Thermal Current	3A			
Rated Operating Voltage		30V DC	125V AC	
Rated Operating Current (electrical life: 100,000 operations)	Resistive Load	0.1A	0.1A	
Contact Material		Gold plated 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	DC	Inductive load	2A	0.4A	—	
Operating Current	Electrical	AC AC	Resistive load	_	5A	3A	
ourroint	Life	50/60Hz	Inductive load	—	3A	1.5A	
	100,000	100,000	DC	Resistive load	ЗA	0.6A	—
	operations	DC	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-LED22
Current Draw	5 mA (typ.)		
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 (+) Noise protection circuit X2 (-) Dimmer protection circuit	X1-Limited curre Noise protect X2-Dimmer prote	ion circuit uit

• 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.



-25 to +60°C (no freezing)

-30 to +80°C (no freezing) 45 to 85% RH (no condensation)

2,000V AC, 1 minute Between terminals of different poles:

2,000V AC, 1 minute

1,000V AC, 1 minute

2,000V AC, 1 minute Operating extremes/Damage limits:

Damage limits:

Selector switches:

Selector switches: Key selector switches:

IP65 (IEC 60529) Solder/tab terminal #110

PC board terminal

14g (LB8L-M1T24)

13g (LB8P-1T04)

13g (LB8B-M1T2)

15g (LB8S-2T2) 27g (LB8K-2ST2A) 15g (LB8GL-M1T24) 14g (LB8GB-M1T2)

Key selector switches:

Momentary: 50,000 / 100,000 (\*1)

Maintained: 50,000 / 100,000 (\*2)

Momentary:

Maintained:

Between live part and ground:

5 to 55 Hz, amplitude 0.5 mm Operating extremes: 100 m/s<sup>2</sup>

Illuminated units: -25 to +55°C

50 mΩ maximum (initial value)

100  $M\Omega$  minimum (500V DC megger) Between live part and ground:

Between terminals of the same poles:

1,000 m/s<sup>2</sup>

2,000,000

250.000

250.000

250,000

50,000 / 100,000 (\*2)

50,000 / 100,000 (\*2)

**Specifications** 

**Operating Temperature** 

Storage Temperature

Insulation Resistance

Dielectric

Strength

Switch Unit

Illumination

Unit

Vibration Resistance

Shock Resistance

Mechanical Life

**Electrical Life** 

**Terminal Style** 

Weight (approx.)

(minimum operations)

(minimum operations)

**Degree of Protection** 

Operating Humidity Contact Resistance

# Switches & Pilot Lights

APEM
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 Interfaces
Sensors
AUTO-ID
Flush Silhouette
ø16
ø22
ø30
Miniature
Pilot Lights
CW
LW-F
LB
LBW
UP
Flush Bezel

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

Controllers

Operator

Interfaces

Sensors

AUTO-ID

ø16

ø22

ø30 Miniature Pilot Lights

> CW LW-F

UP Flush Bezel

les & Pilot	Illuminated Pushbuttons Solder/Tab Terminal				Package Quantity:1	
Pilot Lights	Part No. / Shape	LB①L-②1T③		0		
APEM			Round /	Black Bezel Square /	Black Bezel Rectangular / Black Be	
Switches & Pilot Lights						
Control Boxes		Round / Metallic Bezel	Square / Metallic Bezel	Rectangular / Metallic Bezel	Round with Guard Squ	uare with Guard Rectangular with Guard
Emergency Stop Switches	① Shape	② Operation	3 Contact	④ LED Operating Voltage	Part No.	* Illumination Color Code
Enabling Switches		Momentary	Gold/SPDT	24V AC/DC	LB①L-M1T14*	
Safety Products	Black bezel	Momentary	Gold/DPDT	24V AC/DC	LB①L-M1T24*	
	Diack Dozon	Maintained	Gold/SPDT	24V AC/DC	LB <sup>①</sup> L-A1T14*	Specify the color code in place of * in
Explosion Proof			Gold/DPDT		LB1L-A1T24*	the Part No.
Terminal Blocks		Momentary	Gold/SPDT	24V AC/DC	LB1L-M1T14*	
Relays & Sockets	Metallic bezel		Gold/DPDT		LB1L-M1T24*	A: amber G: green
	inotanio soloi	Maintained	Gold/SPDT	24V AC/DC	LB <sup>①</sup> L-A1T14*	– PW: pure white
Circuit Protectors		Gold/DPDT		211110/20	LB <sup>①</sup> L-A1T24*	R: red
		Momentary	Gold/SPDT	24V AC/DC	LB1L-M1T14*	S: blue
Power Supplies	Guard Type	······,	Gold/DPDT		LB1L-M1T24*	Y: yellow
LED Illumination		Maintained	Gold/SPDT		LB1L-A1T14*	

Illuminated pushbuttons contain an LED unit. For details on LED units, see B-130.

• The guard opens 180 degrees spring-return.

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-133 for details on the marking plate and film.

24V AC/DC

• PC board terminals available for gold contacts. Silver contacts also available. To specify, see Part Number Development below.

Gold/DPDT

• 5V DC and 12V AC/DC LED operating voltages also available.

• Other bezel sizes available (LBW series). For details, see B-093.

#### Part Number Development

#### LB1L-21T345\*

_	① Shape				
_	Code	Shape			
	6	Round / Black Bezel			
-	7	Square / Black Bezel			
_	8	Rectangular / Black Bezel			
	6M	Round / Metallic Bezel			
	7M	Square / Metallic Bezel			
	8M	Rectangular / Metallic Bezel			
_	6G	Round with Guard			
	7G	Square with Guard			
	8G	Rectangular with Guard			

#### 2 Operation

Code	Operation
Α	Maintained
М	Momentary

0 00macto		
Code	Contact	
1	Gold/SPDT	
2	Gold/DPDT	
5	Silver/SPDT	

Silver/DPDT

(a) Contacto

6

LB1L-A1T24\*

#### **④ LED Operating Voltage**

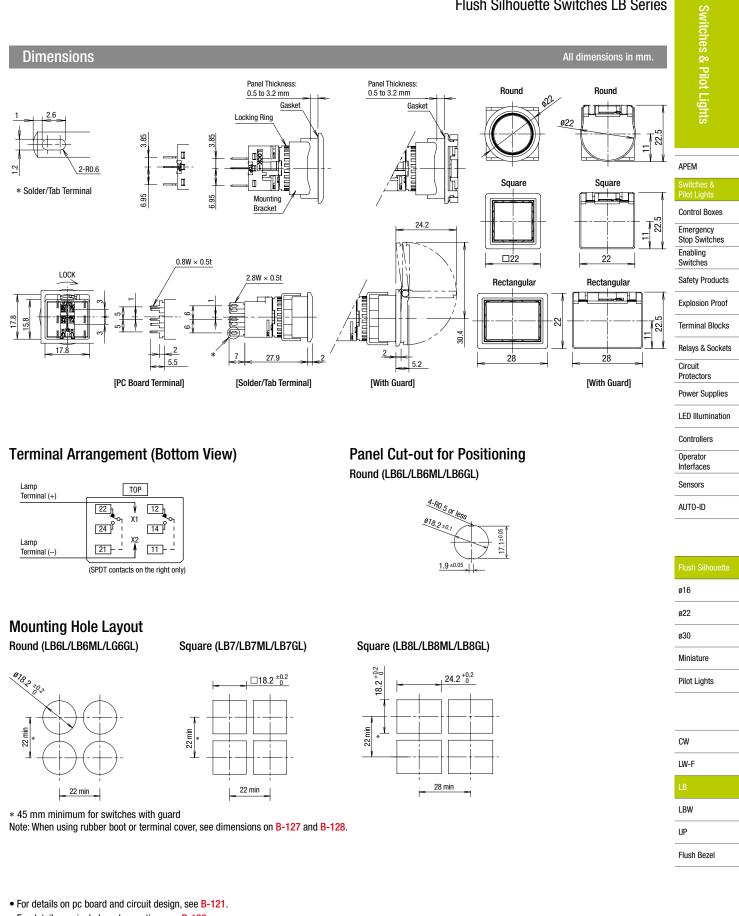
Code	Rated Operating Voltage
1	5V DC
3	12V AC/DC
4	24V AC/DC

#### **5** Others LBW

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
V	PC Board Terminal (Gold Contact Only)	LB6L-M1T14V*

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

# All dimensions in mm.



• For details on single board mounting, see B-122.

Relays & Sockets

LED Illumination

Controllers

Operator Interfaces Sensors

AUTO-ID

Circuit Protectors

ches	Dilatlia	hto			_	_	_	_		
∞ ₽	Pilot Lights									
liot	Solder/Tab Terminal									
ches & Pilot Lights	Part No. / Shape	LB①P-②TO③④*								
APEM		Ŵ				<b>I</b>	<b>N</b>		<b>I</b>	
Switches & Pilot Lights		Round / Black Bezel	Square / R Black Bezel	Rectangular / Black Bezel	Round / Metallic Bezel	Dome / Black Bezel	Square / Metallic Bezel	Rectangular / Metallic Bezel	Dome / Metallic Bezel	
Control Boxes	l ana Chana	() Chana	3 LED Operati	ing	Dort No					
Emergency Stop Switches	② Lens Shape	① Shape	Voltage		Part No.	* Illumination Color Code				
Enabling Switches	Fluch	Black Bezel	24V AC/DC	LB①P-1	T04*	Specify the colo	r code in place of	* in the Part No.		
Safety Products	Flush	Metallic Bezel	24V AC/DC	LB <sup>①</sup> P-1	τ∩ <i>1</i> .*	A: amber				
Explosion Proof			247 A0/00		104**	G: green				
Terminal Blocks		Black Bezel	24V AC/DC	LB6P-2T	<b>[04</b> *	PW: pure wi R: red S: blue	PW: pure white R: red			
Relave & Sockate	Dome		-							

• Pilot lights contain an LED unit. For maintenance LED units see B-130.

Power Supplies • 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.

LB6MP-2T04\*

• PC board terminals available. To specify, see Part Number Development below.

24V AC/DC

• 5V DC and 12V AC/DC LED operating voltages also available.

Metallic Bezel

• Other bezel sizes available (LBW series). For details, see B-095.

#### Part Number Development

#### LB1P-2T034\*

#### 1) Shape

© ondpo						
uette	Code	Shape				
	6	Round / Black Bezel				
ø16	7	Square / Black Bezel				
ø22	8	Rectangular / Black Bezel				
	6M	Round / Metallic Bezel				
ø30	7M	Square / Metallic Bezel				
	8M	Rectangular / Metallic Bezel				

#### Miniature • Round only for dome.

Pilot Lights

CW

LW-F

LBW UP

④ Others							
Code	Specification	Part No. Example					
Blank	Solder/Tab Terminal	—					
V	PC Board Terminal	LB6P-1T04V*					

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

#### 2 Lens Shape

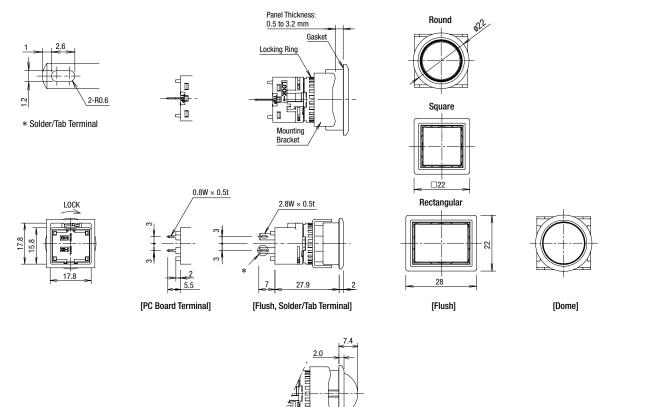
Conto .	e Eolio oliapo					
Code	Lens Shape					
1	Flush					
2	Dome					

#### **③ LED Operating Voltage**

Y: yellow

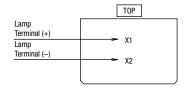
<u> </u>							
Code	Rated Operating Voltage						
1	5V DC						
3	12V AC/DC						
4	24V AC/DC						

#### **Dimensions**



[Dome]

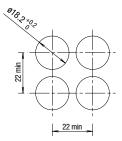
#### **Terminal Arrangement (Bottom View)**

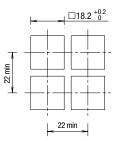


#### **Mounting Hole Layout**

Round (LB6P/LB6MP)





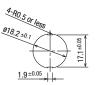


Note: When using rubber boot or terminal cover, see dimensions on B-127 and B-128.

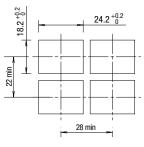
• For details on pc board and circuit design, see B-121.

• For details on single board mounting, see B-122.

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



#### Square (LB8P/LB8MP)



d			
1			
7			
9			

All dimensions in mm.

Terminal Blocks Relays & Sockets

Safety Products Explosion Proof

Circuit Protectors

Power Supplies LED Illumination

Controllers

Operator Interfaces

Sensors

AUTO-ID

## ø16 ø22 ø30 Miniature Pilot Lights

CW LW-F LBW UP Flush Bezel

APEM

Control Boxes Emergency Stop Switches Enabling Switches

iche -										
& S6	Pushbut	tons								
Pilo	Solder/Tab Terminal Package Quantity:1									
tches & Pilot Lights	Part No. / Shape	LB1B-21	T34*	Round / Black Be:	zel Square / Black E	Bezel Rectangular / Blac	k Bezel			
APEM				- 1	and the second se					
Switches & Pilot Lights										
Control Boxes		Round / Metallic B	ezel Square / Me	tallic Bezel Recta	angular / Metallic Bezel	Round with Guard	Square with Guard	Rectangular with Guard		
Emergency Stop Switches	① Shape	Button Style	2 Operation	3 Contact		Part No.		Color Code		
Enabling			opplation		Gold Contact	Silver Contact				
Switches			Momontary	SPDT DPDT	LB1B-M1T1* LB1B-M1T2*	LB1B-M1T5* LB1B-M1T6*	B: black			
Safety Products			Momentary	3PDT	LB <sup>(1)</sup> B-M1T3*	LB0B-M1T7*	G: green R: red			
Evaluation Dreaf		Button		SPDT	LB <sup>①</sup> B-A1T1*	LB@B-A1T5*	S: blue			
Explosion Proof			Maintained	DPDT	LB <sup>①</sup> B-A1T2*	LB <sup>①</sup> B-A1T6*	W: white			
Terminal Blocks			Maintainou	3PDT	LB <sup>①</sup> B-A1T3*	LB <sup>①</sup> B-A1T7*	Y: yellow			
	Black bezel			SPDT	LB1B-M1T1L*	LB <sup>①</sup> B-M1T5L*	A: amber			
Relays & Sockets		Lens	Momentary	DPDT	LB <sup>(1)</sup> B-M1T2L*	LB1B-M1T6L*	G: green			
Circuit				3PDT	LB1B-M1T3L*	LB1B-M1T7L*	R: red			
Protectors				SPDT	LB1B-A1T1L*	LB1B-A1T5L*	S: blue			
Power Supplies			Maintained	DPDT	LB1B-A1T2L*	LB1B-A1T6L*	W: white			
				3PDT	LB1B-A1T3L*	LB1B-A1T7L*	Y: yellow			
LED Illumination				SPDT	LB1B-M1T1*	LB1B-M1T5*	B: black			
Controllers			Momentary	DPDT	LB1B-M1T2*	LB10B-M1T6*	G: green			
		Button		3PDT	LB1B-M1T3*	LB①B-M1T7*	R: red			
Operator Interfaces				SPDT	LB <sup>®</sup> B-A1T1*	LB@B-A1T5*	S: blue W: white			
Concora			Maintained	DPDT	LB <sup>①</sup> B-A1T2*	LB@B-A1T6*	Y: yellow			
Sensors	Metallic bezel			3PDT SPDT	LB <sup>①</sup> B-A1T3* LB <sup>①</sup> B-M1T1L*	LB1B-A1T7* LB1B-M1T5L*				
AUTO-ID			Momentary	DPDT	LBUB-MITTL*	LBUB-M1T6L*	A: amber			
			womentaly	3PDT	LB0B-M1T3L*	LB@B-M1T7L*	G: green R: red			
		Lens		SPDT	LB <sup>(1)</sup> B-A1T1L*	LB@B-A1T5L*	S: blue			
			Maintained	DPDT	LB@B-A1T2L*	LB@B-A1T6L*	W: white			
Flush Silhouette				3PDT	LB <sup>①</sup> B-A1T3L*	LB@B-A1T7L*	Y: yellow			
Hush Gilliouette				SPDT	LB1B-M1T1*	LB <sup>①</sup> B-M1T5*	B: black			
ø16			Momentary	DPDT	LB1B-M1T2*	LB10B-M1T6*	G: green			
		Button		3PDT	LB1B-M1T3*	LB10B-M1T7*	R: red			
ø22		Dullon		SPDT	LB1B-A1T1*	LB10B-A1T5*	S: blue			
ø30			Maintained	DPDT	LB1B-A1T2*	LB10B-A1T6*	W: white			
	Guard Type			3PDT	LB1B-A1T3*	LB10B-A1T7*	Y: yellow			
Miniature				SPDT	LB1B-M1T1L*	LB1B-M1T5L*	A: amber			
Pilot Lights			Momentary	DPDT	LB1B-M1T2L*	LB: B-M1T6L*	G: green			
		Lens		3PDT	LB1B-M1T3L*	LB1B-M1T7L*	R: red S: blue			
			Maintained	SPDT	LB1B-A1T1L* LB1B-A1T2L*	LB1B-A1T5L* LB1B-A1T6L*	W: white			
			wannanieu	DPDT 3PDT	LBUB-ATT2L*	LBUB-A116L*	Y: yellow			
	L	I	1	JEDI	LDUD-ATISL*	LDUD-ATTIL*	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			

• 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 LW-F 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.

• Other bezel sizes available (LBW series). For details, see B-097.

## Flush Bezel

CW

LBW

UP

## Part Number Development LB1B-21T34\*

① Shape					
Code	Shape				
6	Round / Black Bezel				
7	Square / Black Bezel				
8	Rectangular / Black Bezel				
6M	Round / Metallic Bezel				
7M	Square / Metallic Bezel				
8M	Rectangular / Metallic Bezel				
6G	Round with Guard				
7G	Square with Guard				
8G	Rectangular with Guard				

#### (a) Contacto

2 Operation			③ Conta	cts		
Code	Code Operation		Code	Contact	Code	Contact
Α	Maintained		1	Gold/SPDT	5	Silver/SPDT
М	M Momentary		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> *

B-079

#### For more information, visit http://eu.idec.com

Round

All dimensions in mm.

Round

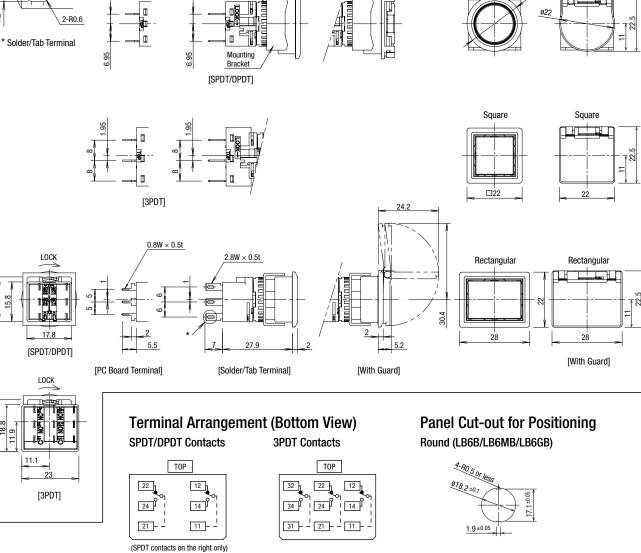






Thush onnouelle
ø16
ø22
ø30
Miniature
Pilot Lights
CW
LW-F
LB

LBW UP Flush Bezel



Panel Thickness:

0.5 to 3.2 mm Gasket

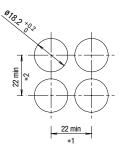
**Mounting Hole Layout** Round (LB6B/LB6MB/LB6GB)

**Dimensions** 

2

17.8 15.8

20. 8



#### Square (LB7B/LB7MB/LB7GB)

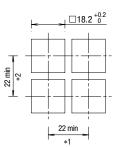
Panel Thickness:

Gaske

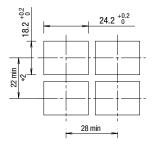
0.5 to 3.2 mm

Locking Ring

3.85



#### 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.



APEM APEM Switches & Pilot Lights Control Boxes Emergency Stop Switches Enabling Switches Safety Products	Selector Solder/Tab Termir Part No. / Shape	Switches hal LB ① S - ② O Knob Op Round / Blac Lever Op	erator k Bezel Square / Black Bezel	Rectangular / R Square / Metal		/ Metallic Bezel	Figure / Metallic Bezel	Package Quantity:1
Explosion Proof	① Shape		② Operator Position		③ Contact	Part No		
					0007		I Contact	Silver Contact
Terminal Blocks		90°	Maintained		SPDT	LB①S		LB <sup>®</sup> S-2T5
Relays & Sockets		2-position		LR	DPDT	LB①S	5-2T2	LB <sup>①</sup> S-2T6
Circuit				~	3PDT	LB①S	G-2T3	LB <sup>①</sup> S-2T7
Protectors	Black bezel		Maintained	ĻĊŖ	DPDT	LB①S	5-3T2	LB <sup>①</sup> S-3T6
Power Supplies		45°		$\bigvee$	3PDT	LB①S	S-3T3	LB <sup>①</sup> S-3T7
LED Illumination		3-position	Spring return two-way	L-C-R	DPDT	LB①S	G-33T2	LB <sup>①</sup> S-33T6
Controllers				$\bigvee$	3PDT	LBIS	G-33T3	LB1)S-33T7
Operator			Maintained		SPDT	LB <sup>①</sup> S	5-2T1	LB <sup>①</sup> S-2T5
Interfaces Sensors		90° 2-position		LR	DPDT	LB①S	S-2T2	LB <sup>①</sup> S-2T6
					3PDT	LB①S	G-2T3	LB <sup>①</sup> S-2T7
AUTO-ID	Metallic bezel		Maintained		DPDT	LB①S	S-3T2	LB <sup>①</sup> S-3T6
		45°			3PDT	LB①S	S-3T3	LB <sup>①</sup> S-3T7
		3-position	Spring return two-way	L_C_R	DPDT	LB①S	6-33T2	LB <sup>①</sup> S-33T6
Flush Silhouette					3PDT	LB①S	G-33T3	LB <sup>①</sup> S-33T7
ø16			cify, see Part Number Developn contacts. To specify, see Part N					

• PC board terminals available for gold contacts. To specify, see Part Number Development below.

ø22 • 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. ø30

• For contact operation, see B-119.

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

Shape

Miniature Pilot Lights

> CW LW-F

LBW

UP

Flush Bezel

#### Part Number Development

Round / Black Bezel

Square / Black Bezel

Round / Metallic Bezel

Square / Metallic Bezel

Rectangular / Metallic Bezel

Rectangular / Black Bezel



1) Shape Code

6

7

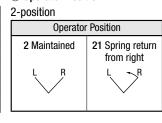
8

6M

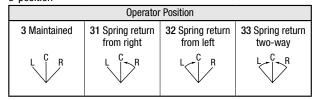
7M

8M

#### 2 Operator Position



#### 3-position



3 Operator		
Operator Shape		
Knob		
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>		

#### For more information, visit http://eu.idec.com

Round

Square

Rectangular

[Lever Operator]

All dimensions in mm.

er?



## 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
CW

CW
LW-F
LB
LBW
UP
Flush Bezel



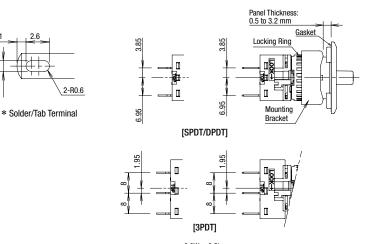
**Dimensions** 

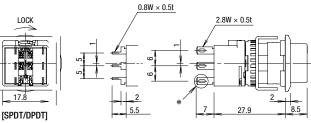
1.2

17.8 15.8

20.8 18.8

11.9





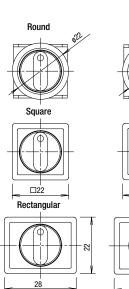
[PC Board Terminal]

[Knob Operator PC Board Terminal]

2

[Lever Operator]

11.1



[Knob Operator]

Terminal Arrangem	nent (Bottom View)
SPDT/DPDT Contacts	3PDT Contacts

LOCK

11.1

[3PDT]





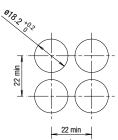
#### Panel Cut-out for Positioning Round (LB6S/LB6MS)

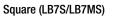


#### **Mounting Hole Layout**

Round (LB6S/LB6MS)

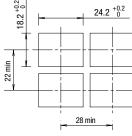
22 min





□18.2 <sup>+0.2</sup><sub>0</sub>

#### 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.



Download catalogs and CAD from http://eu.idec.com/downloads

hes & Pilot	Illumina Solder/Tab Termi	ted Selecto nal	or Switches	S					Package Quantity:1
Pilot Lights	Part No. / Shape	LB①F-②	T345*	:					
APEM				0 0 0		TO TO			
Switches & Pilot Lights				Ro	und / Black Bez	el Square / Black Bez	zel Round / Metallic	Bezel	
Control Boxes									
Emergency Stop Switches	① Shape	2 0	perator Position		③ Contact	④ LED Operating		t No.	* Illumination
Enabling					oomaat	Voltage	Gold Contact	Silver Contact	Color Code
Switches		90°	Maintained	L R	SPDT	24V AC/DC	LB①F-2T14*	LB①F-2T54*	
Safety Products		2-position		$\bigvee$	DPDT	24V AC/DC	LB①F-2T24*	LB①F-2T64*	
Explosion Proof	Black bezel	450	Maintained						Specify the color
Terminal Blocks		45° 3-position		L U R	DPDT	24V AC/DC	LB①F-3T24*	LB①F-3T64*	code in place of * in the Part No.
Relays & Sockets			Maintained	L R	SPDT	24V AC/DC	LB①F-2T14*	LB①F-2T54*	G: green
Circuit Protectors		90° 2-position		$\bigvee$	DPDT	24V AC/DC	LB①F-2T24*	LB <sup>①</sup> F-2T64*	R: red PW: pure white
Power Supplies	Metallic bezel		Maintained	C					-

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.

ç

R

DPDT

• For contact operation, see B-119.

#### Part Number Development

45°

3-position

#### LB(1)F-(2)T(3)(4)(5)\*

ø16 ø22 ø30

LED Illumination

Controllers

Operator

Interfaces

Sensors

AUTO-ID

#### 1) Shape Code Shape 6 Round / Black Bezel

v	Hound / Black Bozon
6M	Round / Metallic Bezel

Miniature Pilot Lights

> CW LW-F

LBW UP Flush Bezel

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

2-position 3-position	I
Operator	Position

2 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

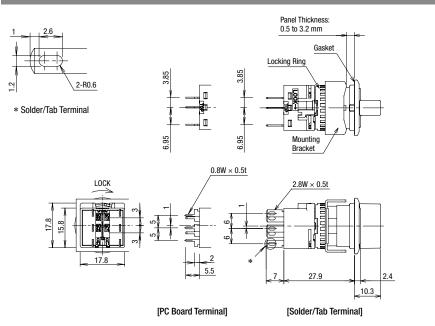
LB①F-3T64\*

#### **5** Others

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

• Specify a color code in place of <u>\* in the Part No.</u>

#### **Dimensions**



#### **Terminal Arrangement (Bottom View)**

Lamp Terminal (+)	ТОР
Lamp Terminal (–)	
	(SPDT contacts on the right only)

#### **Mounting Hole Layout** Round (LB6F/LB6MF)



Note: When using 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.

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

Round

Sl



CW
LW-F
LB
LBW
UP
Flush Bezel

#### 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
CW
LW-F
LB
1.014

Control Boxes Emer Stop Swi Ena

LED Illumination

Controllers

Operator

Sensors

AUTO-ID

CW LW-F

LBW

Flush Bezel

thes &	Key Sele	ector Switches						
	-	Solder/Tab Terminal Package Quantity:1						
Pilot Lights APEM vitches & lot Lights	Part No. / Shape	LB ① K- ② ③ T ④ ⑤ - ⑥ Round / Black Bezel Square	) / Black Bezel	Rectangular / Black Bezel	Round / Metallic Beze	Square / Metallic Bezel	Rectangular / Metallic Bezel	
rol Boxes	① Shape	② Operator Position	5 Key	Removable Position	④ Contact	Part Gold Contact	No. Silver Contact	

	U Unapo		10311011	l liter normova		Ounder	Gold Contact	Silver Contact
Emergency Stop Switches		90°		A: Key removable	L R	SPDT	LB <sup>®</sup> K-2ST1A	LB <sup>①</sup> K-2ST5A
Enabling		2-position	Maintained	in all positions	$\sim$	DPDT	LB <sup>①</sup> K-2ST2A	LB <sup>①</sup> K-2ST6A
Switches	Black bezel				~	3PDT	LB <sup>①</sup> K-2ST3A	LB <sup>①</sup> K-2ST7A
Safety Products		45°	Maintained	A: Key removable		DPDT	LB <sup>®</sup> K-3ST2A	LB <sup>①</sup> K-3ST6A
Explosion Proof		3-position	Maintaineu	in all positions		3PDT	LB <sup>①</sup> K-3ST3A	LB <sup>①</sup> K-3ST7A
Terminal Blocks		00%		A: Key removable	L R	SPDT	LB <sup>①</sup> K-2ST1A	LB <sup>①</sup> K-2ST5A
		90° 2-position	Maintained	in all positions		DPDT	LB <sup>①</sup> K-2ST2A	LB <sup>①</sup> K-2ST6A
Relays & Sockets	Metallic bezel	2-0031001			$\sim$	3PDT	LB <sup>①</sup> K-2ST3A	LB <sup>①</sup> K-2ST7A
Circuit Protectors		45°	Maintained	A: Key removable		DPDT	LB <sup>®</sup> K-3ST2A	LB <sup>®</sup> K-3ST6A
Power Supplies		3-position	Wallitalieu	in all positions	$\bigvee$	3PDT	LB <sup>®</sup> K-3ST3A	LB <sup>①</sup> K-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. Interfaces

• 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

1) Shane

ø16	1) Snape			
	Code	Shape		
ø22	6	Round / Black Bezel		
<i>«</i> 20	7	Square / Black Bezel		
ø30	8	Rectangular / Black Bezel		
Miniature	6M	Round / Metallic Bezel		
	7M	Square / Metallic Bezel		
Pilot Lights	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 r		45° 3-position spring return from left
	33	45°-3-position spring return two-way

#### UP **③ Key Style**

	-	-			
-	Code	Key Style			
-	S	Wave key			
	Blank	Disc tumbler key			

#### **④** Contacts

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

#### **(5) Key Removal Position**

2-position

	Spring return from right		
A: Key removable	B: Key removable	C: Key removable	
in all positions	at left	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				
C R	C C B		<b>D B</b>				
E: Key removable at right / left	G: Key removable at left	H: Key removable at right					

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

#### 3-position

Spring return from right	Spring return from left	Spring return two-way
	O R	<b>O</b> C <b>B</b>

• Key is removable at  $\mathbb{O}$ ,  $\mathbb{O}$ ,  $\mathbb{R}$ . Key is retained at  $\mathbf{0}$ ,  $\mathbf{O}$ , and  $\mathbf{0}$ .

#### **6 Key Number**

6 Key Nurr	iber	(	Others		
Code		1 [	Code	Specification	Part No. Example
Blank	Standard key (0H)	1	Blank	Solder/Tab Terminal	—
1H to 2H	Reversible key	1 [	v	PC Board Terminal	LB6K-2ST1VA
3H to 6H	Non-reversible key	7 L	v	(Gold Contact Only)	
Wayo koy o	nly	•			

· Wave key only.

Round

Square

 $\Box 22$ 

Rectangular

Panel Thickness: 0.5 to 3.2 mm

**DD**E(

24.3

Key No. : N/A to 2H

Dec

Key No. :3H to 6H

Gasket

Locking Ring

Π

Mounting Bracke

i,

2.8W × 0.5t

27

[Solder/Tab Terminal]

85

6.95

[SPDT/DPDT]

[3PDT]

Þ

7

0.8W imes 0.5t

85

3.95

Π

[PC Board Terminal]

All dimensions in mm.

#### APEM

#### 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

Interfaces Sensors

AUTO-ID

ø16
ø22
ø30
Miniature
Pilot Lights
CW
LW-F
LB
LBW
UP

#### Flush Bezel

LOCK

辰

[3PDT]

18.8

**Dimensions** 

12

Key Selector Switches with Wave Key

2-R0 6

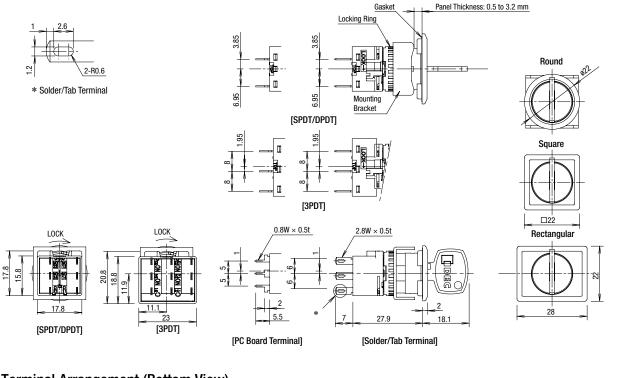
\* Solder/Tab Terminal

LOCK

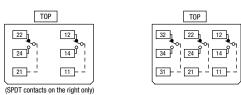
[SPDT/DPDT]

17.8

#### Key Selector Switches with Disc Tumbler Key



## Terminal Arrangement (Bottom View)SPDT/DPDT Contacts3PDT 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.

## Download catalogs and CAD from http://eu.idec.com/downloads

3-position

Example: LB6T-2T1V

 $\bullet$  PC board terminals available for gold contacts. Add "V" to the Part No.

Spring return from

top/bottom

es & Pilot Lights	Lever Sv Solder/Tab Termi								
Lights	Part No. / Shape								
APEM									
Switches & Pilot Lights			I	Round / Black Bezel					
Control Boxes									
Emergency Stop Switches	Shape		Operator Position	Contact	Par	t No.			
Enabling	опаро			Contact	Gold Contact	Silver Contact			
Switches			Maintained	SPDT	LB6T-2T1	LB6T-2T5			
Safety Products		2-position		DPDT	LB6T-2T2	LB6T-2T6			
Explosion Proof			D	3PDT	LB6T-2T3	LB6T-2T7			
Terminal Blocks	Black bezel		Maintained	DPDT	LB6T-3T2	LB6T-3T6			
Relays & Sockets				3PDT	LB6T-3T3	LB6T-3T7			
Circuit	1	2 position	5	1	1				

U

С

D

DPDT

3PDT

LB6T-33T2

LB6T-33T3

LB6T-33T6

LB6T-33T7

Protectors Power Supplies

Circuit

LED Illumination

Controllers • For contact operation, see **B-119**.

Operator Interfaces Sensors

AUTO-ID

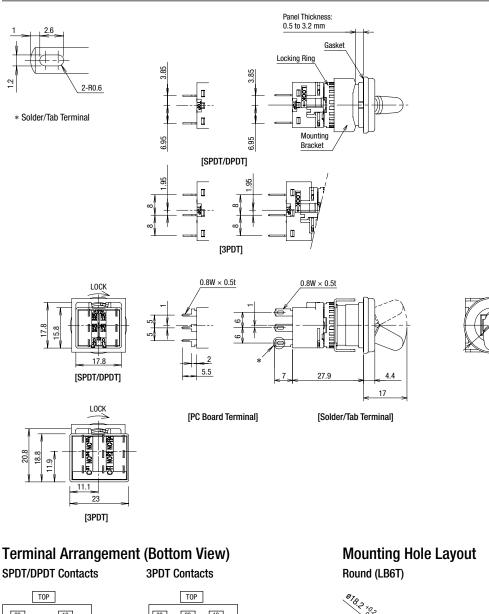
LBW UP

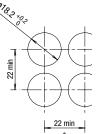
Flush Bezel

## For more information, visit http://eu.idec.com

All dimensions in mm.

#### **Dimensions**





\*: 23.2 mm minimum for 3PDT Note: When using terminal cover, see dimensions on B-128.

Circuit Protectors
Power Supplies
LED Illumination
Controllers
Operator Interfaces
Sensors
AUTO-ID

Switches & Pilot Lights

APEM

Control Boxes

Emergency Stop Switches

Safety Products Explosion Proof

Terminal Blocks

Relays & Sockets

Enabling Switches

ø16
ø22
ø30
Miniature
Pilot Lights
CW
LW-F
LB
LBW
UP
Flush Bezel

## Panel Cut-out for Positioning Round (LB6T)

32

34

22

24

31 - 21 - 11 -

12

14



22

24

21 - -

12

14

11

(SPDT contacts on the right only)

• For details on pc board and circuit design, see B-121.

• For details on single board mounting, see B-122.



#### **Buzzers**

#### Specifications

opcomoations	
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	Steady sound: 80 dB minimum
(at 0.1m)	(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 <sup>2</sup> Damage limits:1,000m/s <sup>2</sup>
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.

AUTO-ID

ø16

ø22 ø30 Miniature Pilot Lights

APEM

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

						Package Quantity: 1	
-		Part No. / Shape					
			Round / Black Bezel Rectangula		F/Black Bezel Round / Metallic Bezel	Rectangular / Metallic Bezel	
			Part No.				
-	Shape		Operating Voltage Degree of Protection		Terminal Style		
					Solder/tab terminal	PC board terminal	
	Black bezel	Round	24V DC	IP54	LB6Z-1T04	LB6Z-1T04V	
-	DIACK DEZEI	Rectangular	24V DC	IP54	LB8Z-1T04	LB8Z-1T04V	
;	Metallic bezel	Round	24V DC	IP54	LB6MZ-1T04	LB6MZ-1T04V	
_	wietanic bezei	Rectangular	24V DC	IP54	LB8MZ-1T04	LB8MZ-1T04V	

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



#### APEM

Control Boxes

Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

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Operator Interfaces

Sensors

AUTO-ID

ø16
ø22
ø30
Miniature
Pilot Lights
CW
LW-F
LB
LBW
UP

Flush Bezel

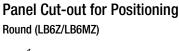
#### **Terminal Arrangement (Bottom View)**

 $0.8W \times 0.5t$ 

5.5

[PC Board Terminal]

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





Panel Thickness: 0.5 to 3.2 mm

Round

Rectangular

28

022

Gasket Locking Ring

Шŝ

Π

Mounting Bracket

2.8W imes 0.5t

27.9

[Solder/Tab Terminal]

## **Mounting Hole Layout**

Round (LB6Z/LB6MZ)

**Dimensions** 

\* Solder/Tab Terminal

2-R0.6

LOCK

XX-3

17.8

1.2

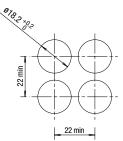
17.8 15.8

Rectangular (LB8Z/LB8MZ)

 $24.2^{+0.2}_{0}$ 

+0.2

8.2



28 min

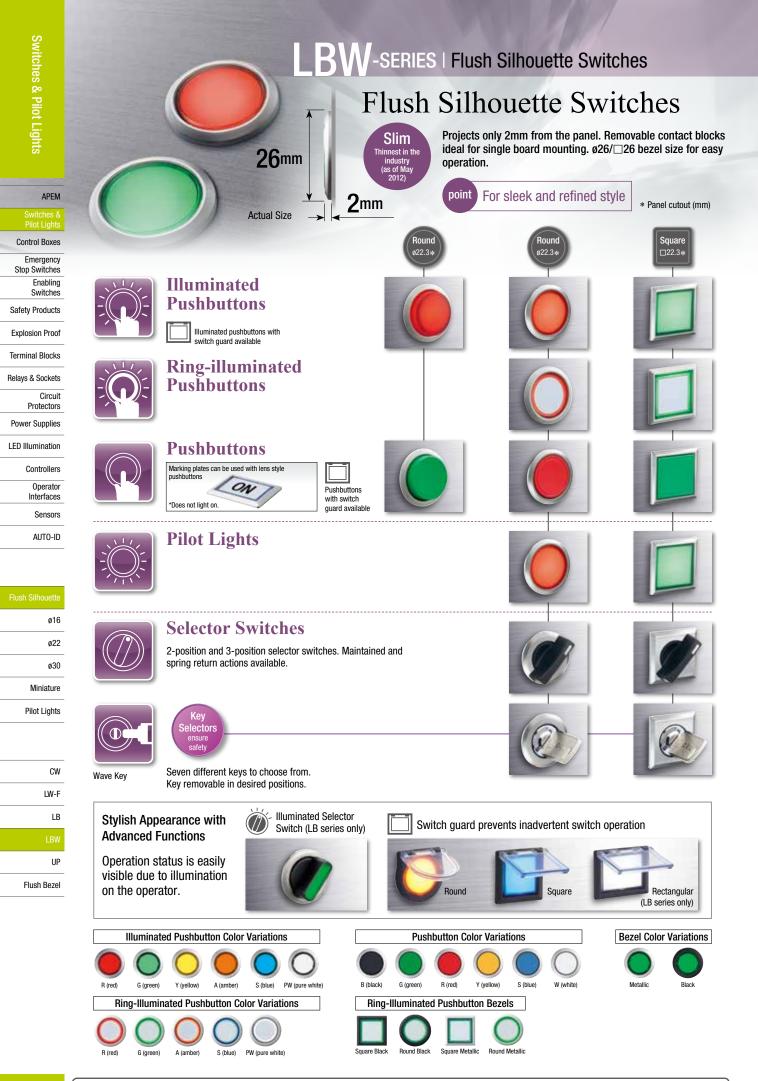
min 1 2

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.





For more information, visit http://eu.idec.com

APEM

Control Boxes Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof Terminal Blocks Relays & Sockets

# 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 (electrical life: 100,000 operations)	Resistive Load	0.1A	0.1A
Contact Material	Gold plated 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		
Data	50,000 operations	DC	Resistive load	5A	1.1A			
Rated		00	Inductive load	2A	0.4A	—		
Operating Current	Electrical Life 100,000	AC 50/60Hz	Resistive load	_	5A	3A		
ourroint			Inductive load	_	3A	1.5A		
		DO	Resistive load	3A	0.6A	—		
	operations DC		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-LED12	LB9Z-LED22				
Current Draw	5 mA (typ.)						
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 (+) Noise protection circuit X2 (-) Dimmer protection circuit	X1– Limited curre Noise protect X2– Rectifier circu Dimmer prote	ion circuit uit				

• 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.



Specific	ations		Circuit Protectors
Operating <sup>-</sup>	Temperature	-25 to +60°C (no freezing) Illuminated units: -25 to +55°C	Power Supplies
Storage Te	mperature	-30 to +80°C (no freezing)	LED Illumination
Operating I		45 to 85% RH (no condensation)	1
Contact Re		$50 \text{ m}\Omega$ maximum (initial value)	- Controllers
Insulation I	Resistance	100 MΩ minimum (500V DC megger)	Operator
		Between live part and ground: 2,000V AC, 1 minute	Interfaces Sensors
Dielectric	Switch Unit	Between terminals of different poles: 2,000V AC, 1 minute	AUTO-ID
Strength		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	Flush Silhouette
Shock Res	istance	Operating extremes: 100 m/s <sup>2</sup> Damage limits: 1,000 m/s <sup>2</sup>	ø22
Mechanica	I Life	Momentary:         2,000,000           Maintained:         250,000	ø30
(minimum	operations)	Selector switches:250,000Key selector switches:250,000	Miniature
Electrical L		Momentary:50,000 / 100,000 (*1) Maintained: 50,000 / 100,000 (*2)	Pilot Lights
•	operations)	Selector switches:         50,000 / 100,000 (*2)           Key selector switches:         50,000 / 100,000 (*2)	
Degree of	Protection	IP65 (IEC 60529)	
Terminal S	tyle	Solder/tab terminal #110 PC board terminal	CW
Weight (approx.)		16g (LBW7L-M1T24) 14g (LBW7P-1T04)	LW-F
		15g (LBW7B-M1T2) 17g (LBW7S-2T2)	LB
		29g (LBW7K-2ST2A)	LBW
		17g (LBW7GL-M1T24) 18g (LBW7GB-M1T2)	UP
1: Switchin	a frequency 1.8	300 operations/h.	Fluch Bozol

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

Flush Bezel

hes & Pilot Lights	Illuminat Solder/Tab Termir Part No. / Shape	ed Pushbuttons nal LBW①L-②③1 Flush				Package Quantity:1
APEM		1	0 🖲			
Switches & Pilot Lights		Round / Black Be	zel Square / Blac	k Bezel Round / Met	allic Bezel Square / Metallic Bezel	Round with Guard Square with Guard
Control Boxes		Extended		Flush Ring-illu	minated	
Emergency Stop Switches		(black bezel is			(black bezel is	
Enabling Switches		also available)			also available)	
Safety Products	① Shape	② Operation	④ Contact	⑤ LED Operating Voltage	Part No.	* Illumination Color Code
Explosion Proof		Momentary		24V AC/DC	LBW①L-M③T14*	
Terminal Blocks	Black bezel			241 A0/D0	LBW①L-M③T24*	
Relays & Sockets		Maintained	Gold/SPDT	24V AC/DC	LBW <sup>①</sup> L-A <sup>③</sup> T14*	- Specify the color code in place
Circuit			Gold/DPDT		LBW1L-A3T24*	of * in the Part No.
Protectors		Momentary	Gold/SPDT	24V AC/DC	LBW@L-M@T04:	A: amber
Power Supplies	Metallic bezel		Gold/DPDT Gold/SPDT		LBW①L-M③T24* LBW①L-A③T14*	— G: green
LED Illumination		Maintained	Gold/DPDT	24V AC/DC	LBW0L-A3114*	PW: pure white R: red
			Gold/SPDT		LBW@L-M@T14*	S: blue
Controllers		Momentary		24V AC/DC	LBW0L-M3T24*	Y: yellow
Oneveter	Guard Type	Guard Type	Gold/DPDT		LBW@L-A@T14*	
Operator Interfaces	uuaiu iype		Gold/SPDT		LDWUL-A3114*	
		Maintained	Gold/SPDT Gold/DPDT	24V AC/DC	LBW①L-A③T14*	_

• 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)

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

• White lens type (when light is off) are available. Clear lens is used instead of colored lens for amber, green, red, and blue illuminated pushbuttons. Amber, green, red, or blue LED units are used. To specify, see Part Number Development below.

- ø22 • 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. ø30

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. Miniature

Pilot Lights

CW

LW-F

UP

Flush Bezel

AUTO-ID

ø16

 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

LBW(1)L-2(3)T(4)(5)(6)\*

#### 1) Shape LB

	-	
	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

⑤ LED Operating Voltage

5V DC

12V AC/DC

24V AC/DC

**Rated Operating Voltage** 

Code

1 3

4

#### **③ Operator Style**

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.

#### 6 Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
۷	PC Board Terminal (Gold Contact Only)	LBW6L-M1T14 <u>V</u> *

· Specify the color code in place of \* in the table above.

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

For more	information,	visit	http://eu.idec.com

All dimensions in I

# **Switches & Pilot Lights**



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

Extended

**Dimensions** 

Flush/Ring-illuminated

2-R0.6

\* Solder/Tab Terminal

LOCK

1節

17.8

Panel Thickness:

Gasket

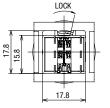
0.5 to 3.2 mm

Locking Ring

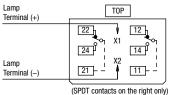
Panel Thickness

Gasket

0.5 to 3.2 mm

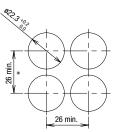




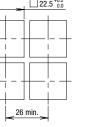


• For details on pc board and circuit design, see B-121.

• For details on single board mounting, see B-122.

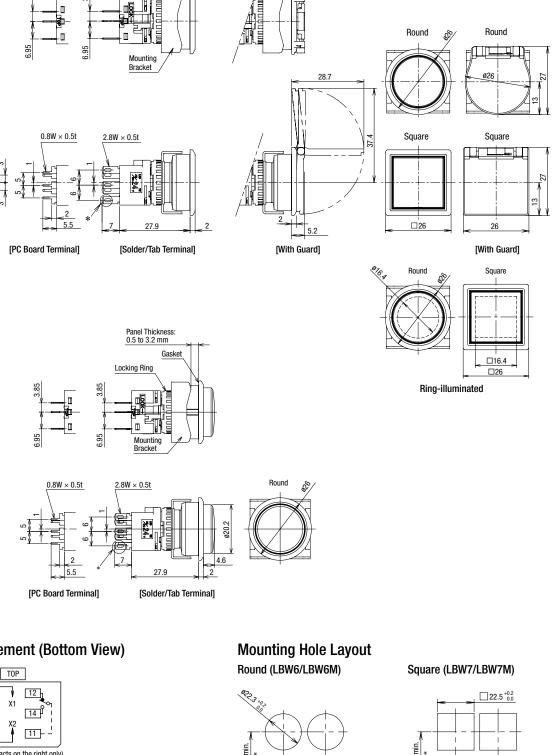


\*: 53 mm minimum for switches with guard.



26

01100	
nm.	



hes & I	Pilot Lights							
Pilot	Solder/Tab Terminal					Package Quantity:1		
hes & Pilot Lights	Part No. / Shape	LBW①P-1T0②③	*					
APEM Switches &		Round / E	Black Bezel Square	/ Black Bezel	Round / Metallic Bezel	Square / Metallic Bezel		
Pilot Lights Control Boxes								
Emergency Stop Switches	1 Shape	③ LED Operating Voltage	Part No.		* Illuminat	ion Color Code		
Enabling Switches				_				
Safety Products	Black Bezel	24V AC/DC	LBW1P-1T04*	Specify	/ the color code in place of * in th	e Part No.		
Explosion Proof				A: G:	amber green			
Terminal Blocks				PW: R:				
Relays & Sockets	Metallic Bezel	24V AC/DC	LBW①P-1T04*	S:	blue			
Circuit Protectors				Y:	yellow			

- Power Supplies • 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. LED Illumination
  - 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. Controllers
    - PC board terminals available. To specify, see Part Number Development below. Operator
  - 5V DC and 12V AC/DC LED operating voltages also available. Interfaces
  - Other bezel sizes available (LB series). For details, see B-077. Sensors

AUTO-ID

#### Part Number Development

#### LBW1P-1T023\*

ø16 ① Shape

## ø22 ø30

Miniature Pilot Lights

> CW LW-F

> > LB

UP

#### 2 LED Operating Voltage

Shape	Code	Rated Operating Voltage
Round / Black Bezel	1	5V DC
Square / Black Bezel	3	12V AC/DC
Round / Metallic Bezel	4	24V AC/DC
Square / Metallic Bezel		

7M **3 Others** 

Code 6

7

6M

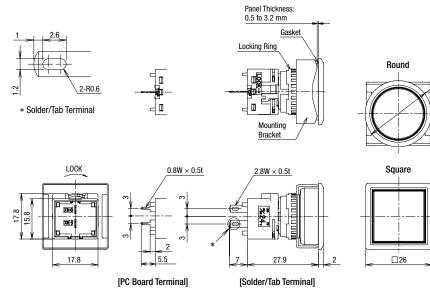
	Code	Specification	Part No. Example
-	Blank	Solder/Tab Terminal	—
.	V	PC Board Terminal	LBW6P-1T04 <u>V</u> *

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

Flush Bezel

All dimensions in mm.

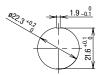
#### **Dimensions**



#### **Terminal Arrangement (Bottom View)**

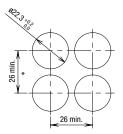
	TOP
Lamp Terminal (+)	
Lamp	→ X1
Terminal (-)	→ X2

#### Panel Cut-out for Positioning Round (LBW6P/LBW6MP)

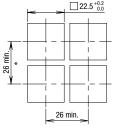


#### **Mounting Hole Layout** Round (LBW6P/LBW6MP)

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
CW

LW-F
LB
LBW
UP
Flush Bezel

es & I	Pushbuttons								
Pilot	Solder/Tab Terminal								Package Quantity:1
& Pilot Lights	Part No. / Shape	LBW 1 B-2 Flush	) <b>1T</b> 34*						Extended
APEM Switches & Pilot Lights		Round / Black Bez	xel Square / Black Bez	xel Round / Metall	lic Bezel Square / Metallic Bezel	Round with Guard	Square with (		Round only
Control Boxes									Round only (metallic bezel available)
Emergency Stop Switches	① Shape	Button Style	② Operation	③ Contact	Part Gold Contact	No. Silver Contact	_	* Illuminat	ion Color Code
Enabling Switches				SPDT	LBW <sup>①</sup> B-M1T1*	LBW <sup>①</sup> B-M1T5*			
Safety Products		Black bezel Button	Momentary	DPDT	LBW <sup>①</sup> B-M1T2*	LBW <sup>①</sup> B-M1T6*			
	Plack bazal			3PDT	LBW <sup>①</sup> B-M1T3*	LBW <sup>①</sup> B-M1T7*			
Explosion Proof	DIACK DEZEI		Maintained	SPDT	LBW <sup>①</sup> B-A1T1*	LBW <sup>①</sup> B-A1T5*			
Terminal Blocks				DPDT	LBW <sup>①</sup> B-A1T2*	LBW <sup>①</sup> B-A1T6*	_		
				3PDT	LBW <sup>①</sup> B-A1T3*	LBW <sup>①</sup> B-A1T7*		Specify the color code in of * in the Part No.	
Relays & Sockets				SPDT	LBW1B-M1T1*	LBW <sup>①</sup> B-M1T5*	OT * IN	the Part No	).
Circuit Protectors			Momentary	DPDT	LBW <sup>①</sup> B-M1T2*	LBW <sup>①</sup> B-M1T6*	_		
Power Supplies	Metallic bezel	Button		3PDT	LBW <sup>①</sup> B-M1T3*	LBW <sup>①</sup> B-M1T7*	B:	black	
Power Supplies				SPDT	LBW1B-A1T1*	LBW1B-A1T5*	G: R:	green red	
LED Illumination			Maintained	DPDT	LBW <sup>①</sup> B-A1T2*	LBW <sup>①</sup> B-A1T6*	- S:	blue	
Controllers				3PDT	LBW <sup>®</sup> B-A1T3*	LBW <sup>①</sup> B-A1T7*	W:	white	
				SPDT	LBW <sup>®</sup> B-M1T1*	LBW 1B-M1T5*	Y:	yellow	
Operator Interfaces		Momentary	Momentary	DPDT	LBW <sup>®</sup> B-M1T2*	LBW <sup>®</sup> B-M1T6*	_		
Sensors	Guard Type	Button		3PDT	LBW <sup>®</sup> B-M1T3*	LBW B-M1T6*	_		
			Maintainad	SPDT	LBW <sup>®</sup> B-A1T1*	LBW <sup>®</sup> B-A1T5*	_		
AUTO-ID			Maintained	DPDT	LBW <sup>®</sup> B-A1T2*	LBW <sup>®</sup> B-A1T6*	_		
				3PDT	LBW1B-A1T3*	LBW <sup>①</sup> B-A1T7*			

• The guard opens 180 degrees spring-return.

• PC board terminals available for gold contacts. To specify, see Part Number Development below.

• Pushbuttons can be used with legend markings engraved on marking plates and lens buttons with clear film inserted in the lens is available. To specify, see Part Number Development below. See 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

#### 1 Shape

ø16

ø22

ø30 Miniature

CW

LW-F

LB

UP

Pilot Lights

	° •	
	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 do

ned
tary

2 Extended \* Extended style is available only for round (black/metallic bezel) and in momentary operation. Guard model is

not available.

Flush

Operation

3 Operator Style

Code

1

**④** Contacts

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

Flush Bezel **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)

For more information, visit http://eu.idec.com

LBW1B-231T45\*

Panel Thickness: 0.5 to 3.2 mm

Gaske

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h

28.7

5.2

[With Guard]

Panel Thickness: 0.5 to 3.2 mm

Locking Ring 

Π

Mounting

Bracket

2.8W × 0.51

27.9

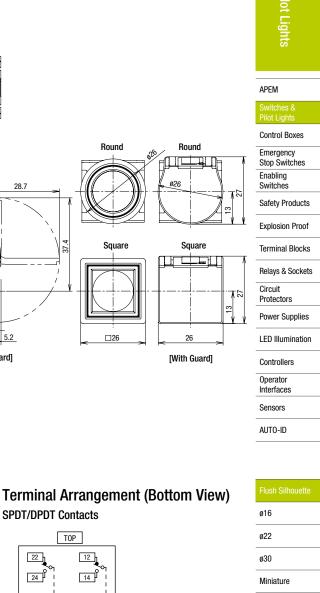
[Solder/Tab Terminal]

6.95

Gasket

All dimensions in mm.

# **Switches & Pilot Lights**



#### **Extended Pushbutton**

Dimensions

**Flush Pushbutton** 

\* Solder/Tab Terminal

2-R0.6

LOCK

2

17.8

[SPDT/DPDT] LOCK

+

C<sup>T</sup> NOT NO Į į

1

명

8

6.95

23 [3PDT] . 🗆

[SPDT/DPDT]

Π

[3PDT]

0.8W × 0.5t

[PC Board Terminal]

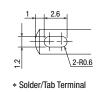
6.95

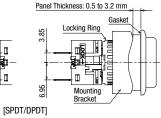
2

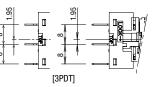
17.8

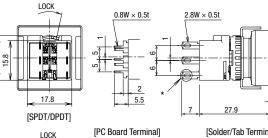
20.8 18.8 15.8

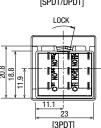
11.9



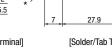






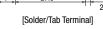


17.8

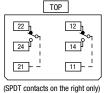


## 4.1

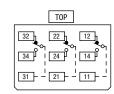
Round



## 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**.

# bownload catalogs and CAD from http://eu.idec.com/downloads

UP

Flush Bezel

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<b>C</b> 2
<b>D</b>
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Controllers

Operator Interfaces

Sensors

AUTO-ID

ø22

ø30

CW

LW-F

LB

UP

Miniature

Pilot Lights

witches & Pilot Lights	Selector Solder/Tab Termir Part No. / Shape	Switches al LBW①S-②	)T34				Package Quantity:1
APEM							2
Switches & Pilot Lights			Round / Black Bezel	Square / Blac	k Bezel Round /	Metallic Bezel Square / Metallic I	Bezel
Control Boxes							
Emergency Stop Switches	① Shape		② Operator Position		③ Contact		No.
Enabling Switches			Maintained		SPDT	Gold Contact	Silver Contact
Safety Products		90°		LR	DPDT		
Explosion Proof		2-position		•		LBW <sup>①</sup> S-2T2	LBW <sup>①</sup> S-2T6
Terminal Blocks					3PDT	LBW <sup>①</sup> S-2T3	LBW <sup>①</sup> S-2T7
	Black bezel		Maintained	LCR	DPDT	LBW <sup>①</sup> S-3T2	LBW <sup>①</sup> S-3T6
Relays & Sockets		45°		$\vee$	3PDT	LBW <sup>①</sup> S-3T3	LBW <sup>①</sup> S-3T7
Circuit Protectors		3-position	Spring return two-way	L-C-R	DPDT	LBW <sup>®</sup> S-33T2	LBW <sup>①</sup> S-33T6
Power Supplies				$\bigvee$	3PDT	LBW <sup>①</sup> S-33T3	LBW <sup>①</sup> S-33T7
LED Illumination			Maintained	L R	SPDT	LBW <sup>①</sup> S-2T1	LBW <sup>①</sup> S-2T5

R

DPDT

3PDT

DPDT

3PDT

DPDT

DPDT

LBW<sup>①</sup>S-2T2

LBW<sup>①</sup>S-2T3

LBW<sup>①</sup>S-3T2

LBW<sup>①</sup>S-3T3

LBW<sup>①</sup>S-33T2

LBW<sup>①</sup>S-33T3

LBW<sup>①</sup>S-2T6

LBW<sup>①</sup>S-2T7

LBW<sup>①</sup>S-3T6

LBW<sup>①</sup>S-3T7

LBW<sup>①</sup>S-33T6

LBW<sup>①</sup>S-33T7

• PC board terminals available for gold contacts. To specify, see Part Number Development below. ø16

Maintained

Spring return two-way

• For contact operation, see B-119.

Metallic bezel

• Other bezel sizes available (LB series). For details, see B-081.

90°

45° 3-position

2-position

#### 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

#### **③** Contacts

	0
Flush Bezel	Co

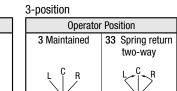
Code	Contact	
1	Gold/SPDT (90° 2-position only)	
2	Gold/DPDT	
3	Gold/3PDT	
5	Silver/SPDT (90° 2-position only)	
6	Silver/DPDT	
7	Silver/3PDT	

#### **②** Operator Position

2 Maintained

R





#### ④ Others

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

All dimensions in mm.



2-R0.6

Solder/Tab Terminal

\*



Control Boxes
Emergency Stop Switches
Enabling Switches
Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

LED Illumination

Controllers

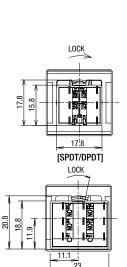
Operator Interfaces

Sensors

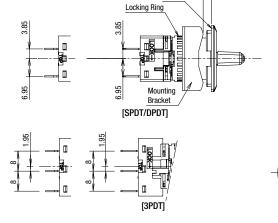
AUTO-ID

ø16
ø22
ø30
Miniature
Pilot Lights
CW
LW-F
LB
LBW
UP

Flush Bezel



[3PDT]



Panel Thickness: 0.5 to 3.2 mm

Gasket

Round

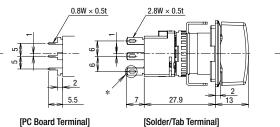
Square

□26

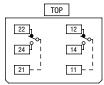
Panel Cut-out for Positioning

.9 -0.1

Round (LBW6S/LBW6MS)



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



(SPDT contacts on the right only)

#### **Mounting Hole Layout** Round (LBW6S/LBW6MS)

Square (LBW7S/LBW7MS)

TOP

22

24

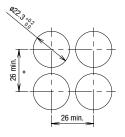
31 - 21 - 11 -

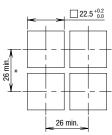
12

14

32

34





• For details on pc board and circuit design, see B-121.

• For details on single board mounting, see B-122.

## bownload catalogs and CAD from http://eu.idec.com/downloads

LED Illumination

Controllers

Sensors

AUTO-ID

ø16

ø22

Miniature Pilot Lights

ies & Pilot	Key Selector Switches Solder/Tab Terminal Package Quantity:1							
Pilot Lights	Part No. / Shape	Wave Key Disc Tumbler Key						
APEM Switches & Pilot Lights							Square / Metallic Bezel	
Control Boxes	① Shape	ာ Oner	ator Position	© Key Remova	hle Position	© Contact	P	art No.
Emergency	U Shape	© Oper	© Operator Position ⑤ Key Removable Position		J Contact	Gold Contact	Silver Contact	
Stop Switches				in all positions	L R	SPDT	LBW <b>TK-2ST1A</b>	LBW <sup>①</sup> K-2ST5A
Enabling Switches		90° 2-position	Maintained		$\sim$	DPDT	LBW <sup>①</sup> K-2ST2A	LBW <sup>①</sup> K-2ST6A
Safety Products	Black bezel					3PDT	LBW <sup>①</sup> K-2ST3A	LBW <sup>①</sup> K-2ST7A
Explosion Proof		45°	Maintained	A: Key removable	U C R	DPDT	LBW <sup>①</sup> K-3ST2A	LBW <sup>①</sup> K-3ST6A
·		3-position		3PDT	LBW <sup>®</sup> K-3ST3A	LBW <sup>①</sup> K-3ST7A		
Terminal Blocks			A: Key removable	L R	SPDT	LBW <sup>①</sup> K-2ST1A	LBW <sup>①</sup> K-2ST5A	
Relays & Sockets	Metallic bezel	90° 2-position	Maintained	in all positions	$\sim$	DPDT	LBW <sup>®</sup> K-2ST2A	LBW <sup>①</sup> K-2ST6A
Circuit Protectors						3PDT	LBW <sup>①</sup> K-2ST3A	LBW <sup>①</sup> K-2ST7A
Power Supplies		45°	Maintained	A: Key removable	(L) <sup>(C)</sup> (R)	DPDT	LBW <sup>①</sup> K-3ST2A	LBW <sup>①</sup> K-3ST6A
I FD Illumination		3-position	Maintained	in all positions	3PDT	LBW <sup>®</sup> K-3ST3A	LBW <sup>①</sup> K-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.

Operator • Two keys are supplied. Interfaces

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

#### Part Number Development

### LBW1K-23T45-6

#### ① Shape ø30

-	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.



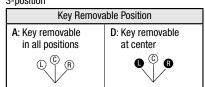
CW

LB	Key Removable Position				
LD	A: Key removable	B: Key removable			
LBW	in all positions	at left			
UP	L R	L B			
Flush Bezel					

#### 2 Operator Position

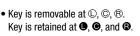
Code	Operator Position	
2	90° 2-position maintained	
3	45° 3-position maintained	
33	45°-3-position spring return two-way	

#### 3-position



#### 3-position





#### · Wave keys only.

#### Others

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

,	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

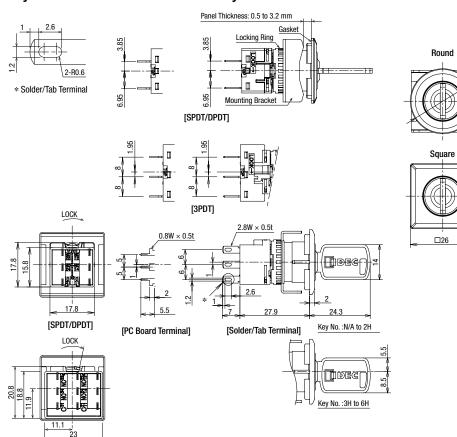
#### 6 Key Number

Standard key
Reversible key
Non-reversible key

For more	information.	visit http://eu.idec.com

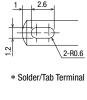
All dimensions in mm.

#### Key Selector Switches with Wave Key

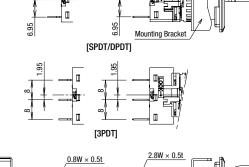


#### Key Selector Switches with Disc Tumbler Key

П



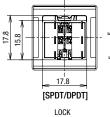
[3PDT]



Panel Thickness: 0.5 to 3.2 mm

Locking Ring

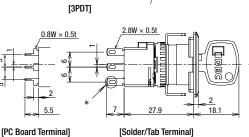
Gaske



Ş 9 脖

[3PDT]

LOCK

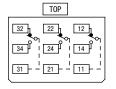








#### **3PDT Contacts**



· 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

ø16
ø22
ø30
Miniature
Pilot Lights
CW
LW-F
LB

Flush Bezel

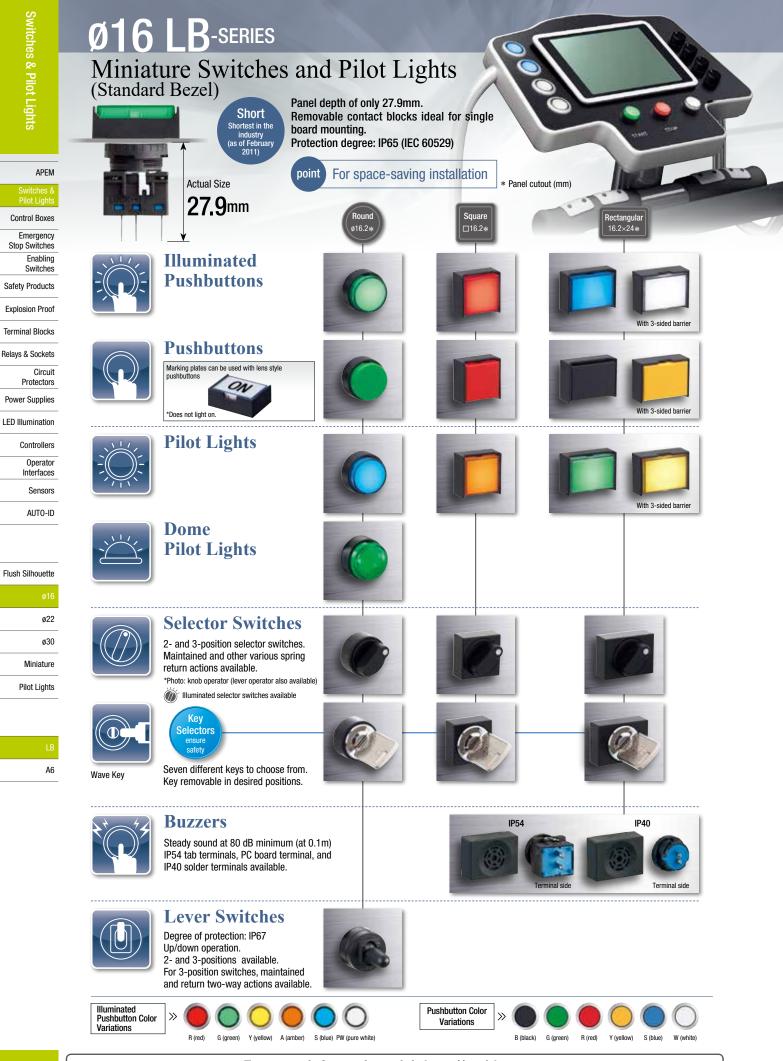
UP

bownload catalogs and CAD from http://eu.idec.com/downloads

Round

Square

□26



B-103

For more information, visit http://eu.idec.com

## 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	3	A	
Rated Operating Voltage	30V DC	125V AC	
Rated Operating Current (electrical life: 100,000 operations)	Resistive Load	0.1A	0.1A
Contact Material		Gold plat	ted 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 50,000 operations	50/60Hz	Inductive load	_	3A	1.5A	
		DC	Resistive load	5A	1.1A	—	
Rated Operating			Inductive load	2A	0.4A	_	
Current	Electrical Life 100,000	AC 50/60Hz	Resistive load	—	5A	3A	
ouncine			Inductive load	—	3A	1.5A	
		DC	Resistive load	ЗA	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-LED22	
Current Draw	5 mA (typ.)			
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, W		
Internal Circuit	X1 (+) Noise protection circuit X2 (-) Dimmer protection circuit	X1– Limited curre Noise protect X2– Rectifier circu Dimmer prote	ion circuit uit	

• 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**

<u>.</u>			_
Operating Temperature		–25 to +60°C (no freezing) Illuminated units: –25 to +55°C	LED Illumination
Storage Temperature		-30 to +80°C (no freezing)	Controllers
Operating I	lumidity	45 to 85% RH (no condensation)	Operator
Contact Re	sistance	50 m $\Omega$ maximum (initial value)	Interfaces
Insulation F	Resistance	100 MΩ minimum (500V DC megger)	Sensors
		Between live part and ground:	Sensors
		2,000V AC, 1 minute	AUTO-ID
	Switch Unit	Between terminals of different poles:	
Dielectric		2,000V AC, 1 minute Between terminals of the same poles:	
Strength		1,000V AC, 1 minute	
	Illumination	Between live part and ground:	Flush Silhouette
	Unit	2,000V AC, 1 minute	
Vibration R	esistance	Operating extremes/Damage limits:	ø16
VIDIALIONI	0010101100	5 to 55 Hz, amplitude 0.5 mm	-00
Shock Resi	stance	Operating extremes: 100 m/s <sup>2</sup>	ø22
		Damage limits: 1,000 m/s <sup>2</sup>	ø30
Mechanica	L L if o	Momentary: 2,000,000 Maintained: 250.000	
(minimum)		Selector switches: 250,000	Miniature
(mining)	operations)	Key selector switches: 250,000	Pilot Lights
		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)	LB
Terminal Style		Solder/tab terminal #110	A6
		PC board terminal	
Weight (approx.)		11g (LB3L-M1T24)	
		10g (LB3P-1T04) 10g (LB3B-M1T2)	
		12g (LB3S-2T2)	
		25g (LB3K-2ST2A)	
		1 - 5 (	1

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

\*2: Switching frequency 1,200 operations/h.

APEM

Control Boxes Emergency Stop Switches Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks Relays & Sockets Circuit Protectors

Power Supplies

#### ø16mm LB Series Switches and Pilot Lights

Controllers

Operator Interfaces Sensors

AUTO-ID

Flush Silhouette

s & I	Illumina	ted Pushbuttor	IS				
Pilot	Solder/Tab Terminal Part No. / Shape LB ① L-② 1T ③ ④ ⑤ *				Package Quantity:1		
& Pilot Lights							
APEM					1	1	<b>I</b>
Switches & Pilot Lights		Rour	d	Square		Rectangular	Rectangular with 3-sided Barrier
Control Boxes			④ LED Operating	Part No.			
Emergency Stop Switches	② Operation	③ Contact	Voltage	Gold Contact	Silver Contact	* Illumination Color Code	
Enabling Switches		SPDT	-	LB①L-M1T14*	LB1L-M1T54*	Specify the color code in plac	e of * in the Part No.
Safety Products	Momentary		24V AC/DC				
Explosion Proof		DPDT		LB①L-M1T24*	LB1L-M1T64*	A: amber G: green	
Terminal Blocks		SPDT		LB①L-A1T14*	LB①L-A1T54*	PW: pure white R: red	
Relays & Sockets Circuit Protectors	Maintained DPDT		24V AC/DC	LB①L-A1T24*	LB①L-A1T64*	S: blue Y: yellow	

• Illuminated pushbuttons contain an LED unit. For details on LED units, see B-130. Power Supplies

• 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 LED Illumination 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\*

#### ① Shape

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

Miniature

ø22

ø30

(2) Operation				
Code	Operation			
Α	Maintained			
М	Momentary			

③ Contacts		
	Code	Contact
	1	Gold/SPDT
	2	Gold/DPDT
	5	Silver/SPDT

Silver/DPDT

6

#### **④ LED Operating Voltage**

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

#### **5** Others

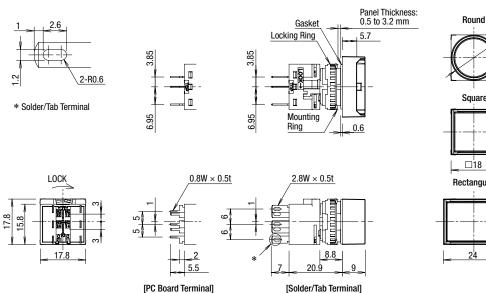
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	-
۷	PC Board Terminal (Gold Contact Only)	LB1L-M1T14⊻*

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

A6

#### ø16mm LB Series Switches and Pilot Lights

#### **Dimensions**



[PC Board Terminal]

**Terminal Arrangement (Bottom View)** 

TOP

(SPDT contacts on the right only)

12

[14]<sup>9</sup>

11

22

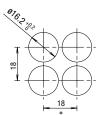
24

21

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



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



Lamp Terminal (+)

Lamp

Terminal (-)

\*: 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.

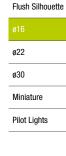
018 Square □18 Rectangular 24

Enabling Switches Safety Products Explosion Proof Terminal Blocks Relays & Sockets Circuit Protectors Power Supplies LED Illumination Controllers Operator

**Switches & Pilot Lights** 

APEM

Control Boxes Emergency Stop Switches



Interfaces

Sensors

AUTO-ID

All dimensions in mm.



APEM

Circuit

Protectors

Controllers Operator Interfaces

Sensors

AUTO-ID

Flush Silhouette

ø22

ø30

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

Pilot Lig	hts					
Solder/Tab Termi	inal					Package Quantity:1
Part No. / Shape	LB1P-2T034*					
	<b>i</b>	) 👘 🛛		Ì	Ѓр	
	Round	Square	R	Rectangular	Rectangular with 3-sided Barrier	Dome
<sup>②</sup> Lens Shape	③ LED Operating Voltage	Part No.		* Illumina	ation Color Code	
Flush	24V AC/DC	LB①P-1T04*	Specify the color code in place of * in the Part No. A: amber G: green			
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**.

Power Supplies • 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.

Lens Shape

2 Lens Shape

Flush

Dome

Code

1

2

• 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

• 5V DC and 12V AC/DC LED operating voltages also available. To specify, see Part Number Development below.

## Part Number Development

## LB1P-2T034\*

#### 1) Shape

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

4 Rectangular with 3-sided Barrier

Round only for dome.

# Miniature ④ Others

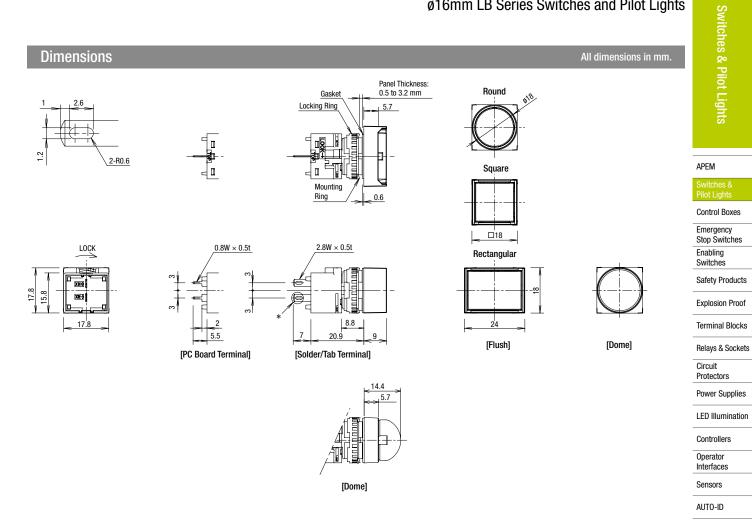
Miniature			
	Code	Specification	Part No. Example
Pilot Lights	Blank	Solder/Tab Terminal	—
	V	PC Board Terminal	LB1P-1T04 <u>V</u> *

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

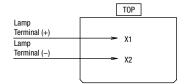
# LB A6

#### ③ LED Operating Voltage

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



## **Terminal Arrangement (Bottom View)**



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

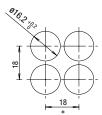


ø22
ø30
Miniature
Pilot Lights

A6

Flush Silhouette

#### **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.



# bownload catalogs and CAD from http://eu.idec.com/downloads

#### B-108

s Sé	Pushbuttons						
Pilot	Solder/Tab Termi	inal	Package Quantity:1				
& Pilot Lights	Part No. / Shape	LB1B-21T30	<u>4</u> )*				
APEM			ĨC I	<b>i</b> i	ì 👘		
Switches & Pilot Lights		Round		Square	Rectangular	r Rectangular with 3-sided Barrier	
Control Boxes					-		
Emergency Stop Switches	Button Style	② Operation	③ Contact	Part No.		* Illumination Color Code	
Enabling	Dutton Olyro			Gold Contact	Silver Contact		
Switches			SPDT	LB1B-M1T1*	LB <sup>①</sup> B-M1T5*	B: black	
Safety Products		Momentary	DPDT	LB <sup>①</sup> B-M1T2*	LB1B-M1T6*	G: green	
Explosion Proof	Button		3PDT	LB1B-M1T3*	LB <sup>①</sup> B-M1T7*	R: red	
·	Dutton		SPDT	LB1B-A1T1*	LB1B-A1T5*	S: blue	
Terminal Blocks		Maintained	DPDT	LB1B-A1T2*	LB1B-A1T6*	W: white Y: yellow	
Relays & Sockets			3PDT	LB1B-A1T3*	LB <sup>①</sup> B-A1T7*		
Circuit			SPDT	LB1B-M1T1L*	LB <sup>(1)</sup> B-M1T5L*		
Protectors	plies	Momentary	DPDT	LB1B-M1T2L*	LB <sup>(1)</sup> B-M1T6L*	A: amber	
Power Supplies			3PDT	LB1B-M1T3L*	LB <sup>①</sup> B-M1T7L*	G: green R: red	
LED Illumination	Lens		SPDT	LB1B-A1T1L*	LB1B-A1T5L*	S: blue	
Controllers		Maintained	DPDT	LB1B-A1T2L*	LB1B-A1T6L*	W: white Y: yellow	
Operator			3PDT LB <sup>①</sup> B-A1T3L* LB <sup>①</sup> B-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

Operator Interfaces

Sensors

AUTO-ID

# Part Number Development LB1B-21T34\*

#### ø22 1) Shape

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

# ② Operation

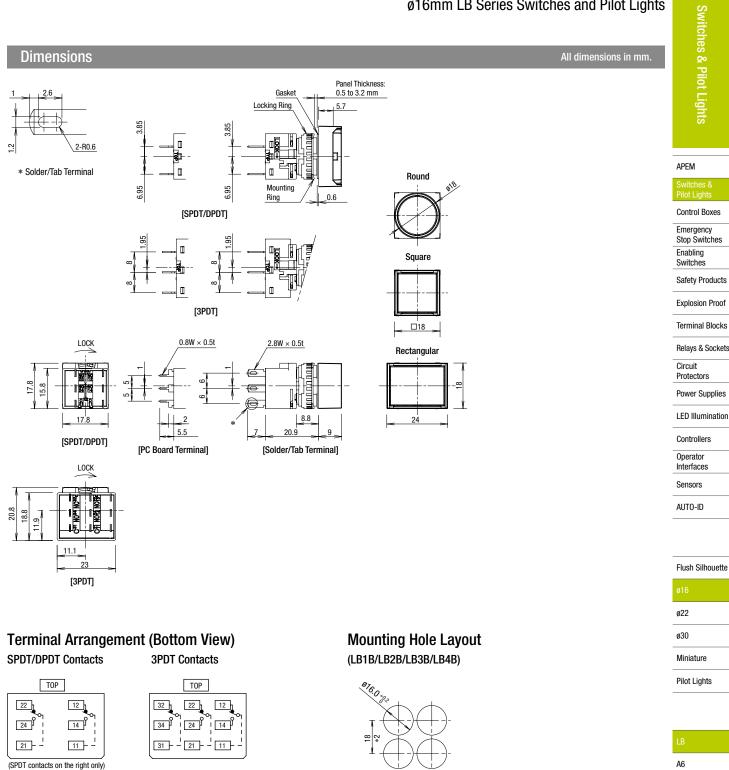
Code	Operation
А	Maintained
М	Momentary

#### **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	—	
	В	Black Translucent Lens (Lens Only)	LB1B-M1T1L <u>B</u>	
	V	PC Board Terminal (Gold Contact Only)	LB1B-M1T1 <u>V</u> *	

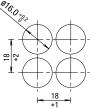


## Panel Cut-out for Positioning (LB1B/LB2B/LB3B/LB4B)



• For details on pc board and circuit design, see B-121.

• For details on single board mounting, see B-122.



\*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.

0								
es & I	Selecto	Selector Switches						
Pilot	Solder/Tab Termi	Solder/Tab Terminal Page Page Page Page Page Page Page Page						
& Pilot Lights	Part No. / Shape	LB1S-23T45	)					
		Knob Operator			Lever Operator			
APEM		The				10	100	
Switches & Pilot Lights		Round	Square	Rectangular	Round	Square	Rectangular	
Control Boxes		Part No.						
Emergency Stop Switches	② Operator Position			3 Contact	Gold Conta		Silver Contact	
Enabling Switches		Maintained		SPDT	LB <sup>①</sup> S-2T1		LB <sup>①</sup> S-2T5	
Safety Products	90° 2-position		LR	DPDT	LB①S-2T2		LB <sup>①</sup> S-2T6	
Explosion Proof			·	3PDT	LB①S-2T3		LB <sup>①</sup> S-2T7	
Terminal Blocks		Maintained	ĻĊŖ	DPDT	LB <sup>①</sup> S-3T2		LB <sup>①</sup> S-3T6	
Relays & Sockets	45°		$\bigvee$	3PDT	LB <sup>①</sup> S-3T3		LB <sup>①</sup> S-3T7	
Circuit Protectors	3-position	Spring return two-way		DPDT	LB <sup>①</sup> S-33T2		LB <sup>①</sup> S-33T6	
Power Supplies				3PDT	LB10S-33T3		LB <sup>①</sup> S-33T7	

LED Illumination • 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.

Controllers • 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. Operator • For contact operation, see B-119. Interfaces

3-position

3 Maintained

R

## Part Number Development

## LB1S-23T45

Shape

Round

Square

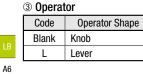
Rectangular



Sensors

AUTO-ID

Switc



2-position

4	Contacts
---	----------

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

#### (5) Others

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

32 Spring return

from left

R

33 Spring return

two-way

R

**Operator Position** 

31 Spring return

from right

R

2 Operator Position

2 Maintained

**Operator Position** 

21 Spring return

from right

Panel Thickness: 0.5 to 3.2 mm

All dimensions in mm.

Round







Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

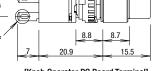
LED Illumination

- Controllers Operator Interfaces
- Sensors AUTO-ID
- Flush Silhouette

Pilot Lights

LB		
A6		

Π [3PDT]  $0.8W \times 0.5t$ 2.8W × 0.5t 8.8 8.7



Gasket Locking Ring

> Mounting Ring

0.6

Π

3.85

6.95

[SPDT/DPDT]

Ш

Π

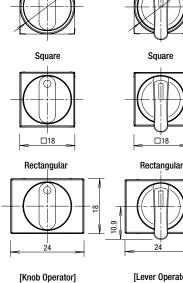
Π

5.5

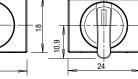
[PC Board Terminal]

3.95

[Knob Operator PC Board Terminal]



Round



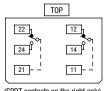
[Lever Operator]



# ø22 ø30 Miniature

# **Terminal Arrangement (Bottom View)**

**3PDT Contacts** 



SPDT/DPDT Contacts

**Dimensions** 

\* Solder/Tab Terminal

\$

17.8 15.8

20.8

2-R0.6

LOCK

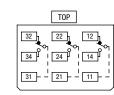
17.8

[SPDT/DPDT]

LOCK

11.1

23 [3PDT]



(SPDT contacts on the right only)

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

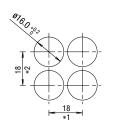


• For details on pc board and circuit design, see B-121.

• For details on single board mounting, see B-122.



## **Mounting Hole Layout** (LB1S/LB2S/LB3S)



\*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.

8.7 18. [Lever Operator]

Download catalogs and CAD from http://eu.idec.com/downloads

Control Boxes Emergency

Safety Products

Terminal Blocks

Relays & Sockets

LED Illumination

Controllers

Operator Interfaces Sensors AUTO-ID

Protectors Power Supplies

#### **Illuminated Selector Switches** Solder/Tab Terminal Package Quantity:1 Part No. / LB1F-2T345\* Shape APEM Round Square Rectangular Part No. **④** LED Operating Stop Switches 2 Operator Position ③ Contact \* Illumination Color Code Voltage **Gold Contact** Silver Contact Enabling Switches Maintained SPDT 24V AC/DC LB1)F-2T14\* LB1F-2T54\* Specify the color code in place 90° R Explosion Proof 2-position of \* in the Part No. DPDT 24V AC/DC LB1)F-2T24\* LB①F-2T64\* G: green R: red PW: pure white Maintained 45° R Circuit DPDT 24V AC/DC LB1)F-3T24\* LB①F-3T64\* 3-position

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

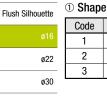
• PC board terminals available for gold contacts. To specify, see Part Number Development below.

• 5V DC and 12V AC/DC LED operating voltages also available. To specify, see Part Number Development below.

• For contact operation, see **B-119**.

#### Part Number Development

#### LB(1)F-(2)T(3)(4)(5)\*



# Shape Round

2 Square 3 Rectangular

Miniature

Pilot Lights

A6

#### **4 LED Operating Voltage**

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

#### ② Operator Position 2

P-position 3-position				
Operator Position				
2 Maintained	3 Maintained			
LR				

**③** Contacts

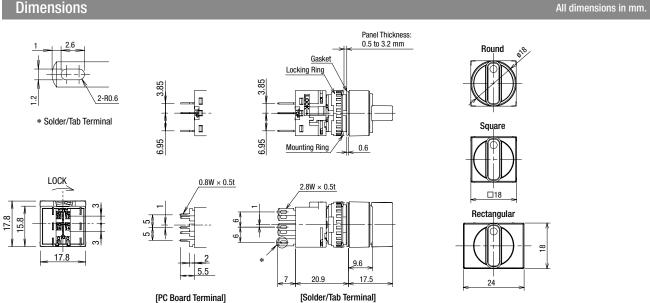
S <b>CO</b>				
Code	Contact			
1	Gold/SPDT (90° 2-position only)			
2	Gold/DPDT			
5	Silver/SPDT (90° 2-position only)			
6	Silver/DPDT			

#### **5** Others

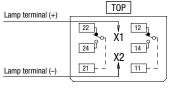
Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
V	PC Board Terminal (Gold Contact Only)	LB1F-2T14 <u>V</u> *

• Specify a color code in place of <u>\* in the Part No.</u>

#### **Dimensions**

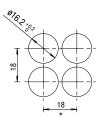


## **Terminal Arrangement (Bottom View)**



(SPDT contacts on the right only)

#### **Mounting Hole Layout** Round (LB1F/LB2F/LB3F)



\*: 24 mm for rectangular units. Note: When using 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.

#### Panel Cut-out for Positioning Round (LB1F/LB2F/LB3F)



#### 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

LB	
A6	

APEM

Control Boxes Emergency Stop Switches Enabling Switches Safety Products Explosion Proof

Terminal Blocks

Relays & Sockets

Controllers Operator

Interfaces Sensors

AUTO-ID

ø22 ø30

Pilot Lights

A6

Flush Silhouette

Key Sel	ector Switches	3						
Solder/Tab Terminal Package Quantit								
Part No. / LB①K-②③T④⑤-⑥								
		10	-	10	10			
		Round		Square	Rectangular			
② Operator Position		(5) Key Removable Position		④ Contact	Part No.			
@ Opt			FUSILION		Gold Contact	Silver Contact		
		A: Key removable in		SPDT	LB <sup>①</sup> K-2ST1A	LB <sup>①</sup> K-2ST5A		
90° 2-position	Maintained all positions	L R	DPDT	LB <sup>①</sup> K-2ST2A	LB <sup>®</sup> K-2ST6A			
2 9001001			$\checkmark$	3PDT	LB <sup>®</sup> K-2ST3A	LB <sup>①</sup> K-2ST7A		
45°	Maintainad	A: Key removable in	(L) (C) (R)	DPDT	LB <sup>①</sup> K-3ST2A	LB <sup>①</sup> K-3ST6A		
3-position	Maintained	all positions		3PDT	LB <sup>①</sup> K-3ST3A	LB <sup>①</sup> K-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. Circuit

Protectors • Two keys are supplied.

• Besides the standard key (key number OH), six other keys are available. Power Supplies

• Disc tumbler keys also available. Only the standard key is available. To specify, see Part Number Development below.

LED Illumination • PC board terminals available for gold contacts. To specify, see Part Number Development below.

• For contact operation, see B-119.

## Part Number Development

Shape

LB1K-23T45-6

Round

Square

Rectangular

#### 2 Operator Position

	e operator i conten					
		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

LB<sup>①</sup>K-3ST3A

LB<sup>①</sup>K-3ST7A

#### **④** Contacts Miniature

① Shape

Code

1 2

3

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	
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	—
V	PC Board Terminal (Gold Contact Only)	LB1K-2ST1 <u>V</u> A

#### **5 Key Removal Position**

2-position							
ł	Spring return from right						
A: Key removable in all positions	B: Key removable at left	C: Key removable at right					

#### 3-position

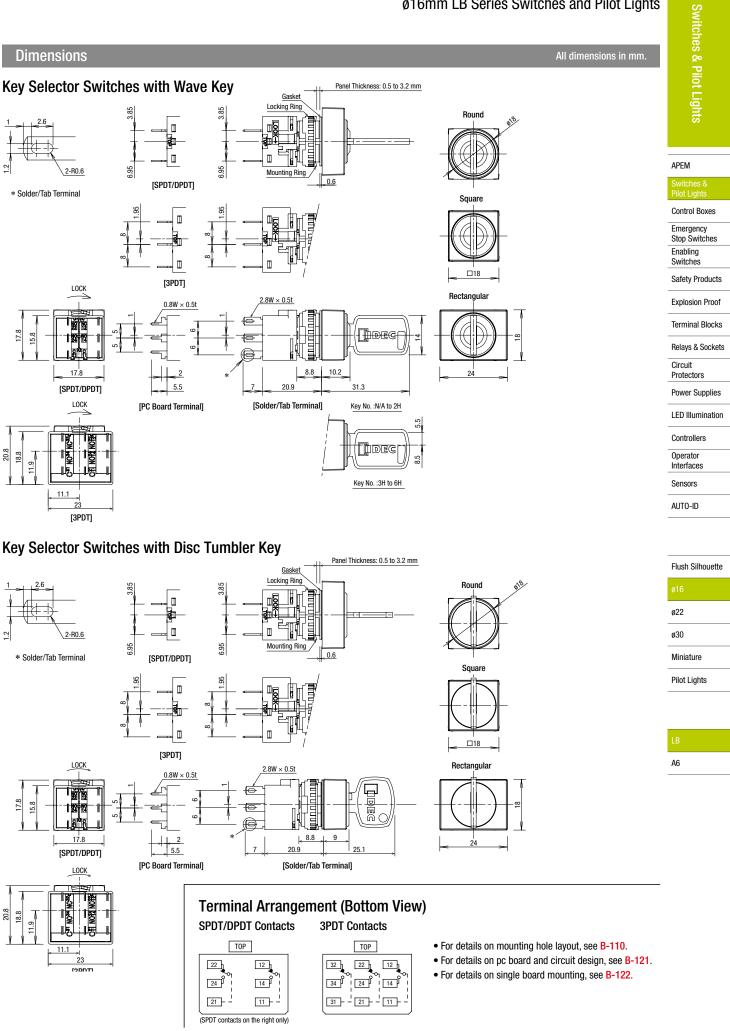
Key Removable Position							
A: Key removable in all positions	B: Key removable at left / center	C: Key removable at center / right	D: Key removable at center				
	Ū_Ū_₿	€ (C) R	● <sup>©</sup> ₿				
E: Key removable at right / left	G: Key removable at left	H: Key removable at right					
L B R		<b>B B</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
	€ ®	€ € €

• Key is removable at  $\mathbb{O}$ ,  $\mathbb{O}$ ,  $\mathbb{B}$ . Key is retained at  $m{0}$ ,  $m{\Theta}$ , and  $m{B}$ .



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



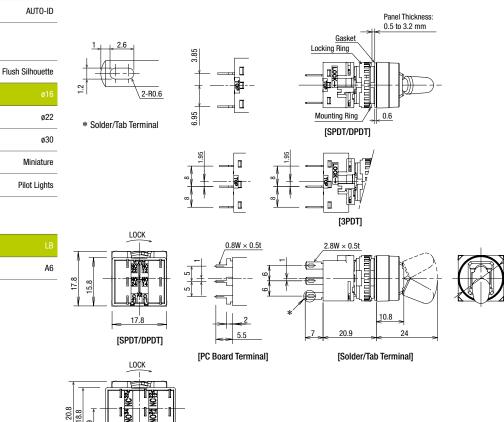
All dimensions in mm.

	Operator Position	Contact	Part	Part No.		
		Contact	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		3PDT	LB1T-3T3	LB1T-3T7		
3-position	Spring return from contract of	DPDT	LB1T-33T2	LB1T-33T6		
		3PDT	LB1T-33T3	LB1T-33T7		

 $\bullet$  PC board terminals available for gold contacts. Add "V" to the Part No. Example: LB1T-2T1V

• For contact operation, see **B-119**.

#### Dimensions



## Terminal Arrangement (Bottom View)

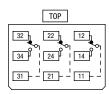
Package Quantity:1

SPDT/DPDT	Contacts



(SPDT contacts on the right only)

#### **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.

6.

11.1 23 [3PDT]

#### **Buzzers**

#### **Specifications**

•				
Rated Insulation Voltage	30V	Dielectric Strength	Between live and dead parts:	ights
Rated Operating Voltage	12, 24V DC		1,000V AC, 1 minute	o
Operating Voltage Range	12V DC±10%, 24V DC±10%	Vibration Resistance	Operating extremes/Damage limits: 5 to 55 Hz, amplitude 0.5 mm	
Current Draw	26mA			
Inrush Current	80mA maximum	Shock Resistance	Operating extremes: 100m/s <sup>2</sup> Damage limits:1,000m/s <sup>2</sup>	APEM
Sound Pressure (at 0.1m)	Steady sound: 80 dB minimum (at the rated voltage)	Life	1,000 hours minimum (beep sound)	Switches & Pilot Lights
Sound Frequency	2.3±0.3kHz	Degree of Protection	LB3Z-1T0*: IP54 (IEC60529) LB3Z-104K: IP40 (IEC60529)	Control Boxes
Response Speed	50 ms maximum		LB3Z-1T0*: Solder/tab terminal #110	Emergency
Operating Temperature	-25 to +60°C (no freezing)	Terminal Style	PC board terminal	Stop Switches
Storage Temperature	-30 to +80°C(no freezing)		LB3Z-104K: Solder terminal	Enabling Switches
Operating Humidity	45 to 85% (no condensation)	Weight (approx.)	11g (LB3Z-1T0*), 8g (LB3Z-104K)	Cofety Dreducte
Insulation Resistance	100 MΩ minimum (500V DC megger)	For applicable standards a	nd UL, CSA ratings, see <mark>B-089</mark> .	Safety Products
			14 0L, 0011441190, 000 D 000.	Explosion Proof

Name and Shape		Operating Voltage Terminal Style —		Part	Terminal Blocks	
				IP54	IP40	
Rectangular			Solder/tab terminal	LB3Z-1T04	_	Relays & Sockets
1 ma	1230	24V DC	PC board terminal	LB3Z-1T04V		Circuit Protectors
	Carlo and a second	240 00				Power Supplies
IP54 IP4	10		Solder terminal	_	LB3Z-104K	LED Illumination

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

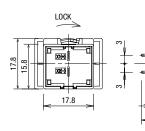
## **Dimensions**

IP54 **Terminal Arrangement** (Bottom View)

	ТОР
Buzzer terminal (+)	→ X1
Buzzer terminal (–)	- X1 
	- 12
	L



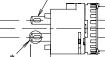
\* Solder/Tab Terminal



[PC Board Terminal]

0.8W imes 0.5t

5.5



Gasket Locking Ring

Mounting

 $2.8W \times 0.5t$ 

8.8

20.9

[Solder/Tab Terminal]

Ring

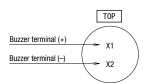
0.6

17.8 23.8

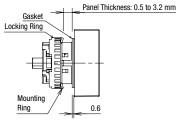
Panel Thickness: 0.5 to 3.2 mm

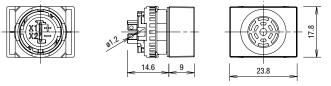
IP40

**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.

**Switches & Pilot Lights** 

Flush Silhouette ø22 ø30 Miniature Pilot Lights

A6

Controllers

Operator Interfaces

Sensors

AUTO-ID

# LB/LBW Series

# **Contact Operation**

Pilot Lights	Selector Switch / Illuminated Selector Switch / Key Selector Switch Operator Position & Contact Operation (Top View)								
ghts			Position	Operator P		Contact	∑ Left	† Center	✓ Right
0,5			FUSILION			CUIILAUL	< LOIT		> night
APEM Switches &						SPDT			
Pilot Lights Control Boxes Emergency Stop Switches	90° 2-position	L Main	L R L R Maintained Spring return from right		7	DPDT	Left Right 14 12 24 22 		Left Right 14 12 24 22 4 $4$ $4$ $4$ $4$ $4$ $4$ $4$ $4$ $4$
Enabling Switches Safety Products Explosion Proof						3PDT	Left Center Right 14 12 24 22 34 32 0 0 0 0 0 11 21 31		Left Center Right 14 12 24 22 34 32 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
Terminal Blocks Relays & Sockets Circuit	45°					DPDT	Left Right 14 12 24 22 • • • • • 11 21	Left Right 14 12 24 22 0 0 0 0 11 21	Left Right 14 12 24 22 14 12 24 22 11 21
Protectors Power Supplies LED Illumination	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	Left Center Right 14 12 24 22 34 32	Left Center Right 14 12 24 22 34 32
Controllers Operator Interfaces							11 <sup>Y</sup> 21 <sup>Y</sup> 31 <sup>Y</sup>		
	Lever Switch								

			Lever Position & Contact Op	peration (Top	ion (Top View)			
AUTO-ID		Position			Down	Center	Up	
Flush Silhouette					14 12 0 11		14 12 • 11	
ø22 ø30	90° 2-position	Maint	v > D ained	DPDT	Left Right 14 12 24 22 0 0 0 0 11 21		Left Right 14 12 24 22 • • • • 11 21	
Miniature Pilot Lights				3PDT	Left Center Right 14 12 24 22 34 32 0 0 0 0 0 11 21 31		Left Center Right 14 12 24 22 34 32 4 4 7 22 34 32 11 21 31	
CW LW-F	45°	u c		DPDT	Left Right 14 12 24 22 $\bullet$ $\bullet$ $\bullet$ $\bullet$ 11 21	Left Right 14 12 24 22 14 $12$ $12$ $12$ $14$ $12$ $14$ $12$ $14$ $12$ $14$ $14$ $14$ $14$ $14$ $14$ $14$ $14$	Left Right 14 12 24 22 11 21 12 12 12 12 12 12 12 12 12 12 12 1	
LB LBW UP	3-position D Maintained	∽ <sub>D</sub> Spring return two-way	3PDT	Left Center Right 14 12 24 22 34 32 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Left Center Right 14 12 24 22 34 32 0 0 0 0 0 0 11 21 31	Left Center Right 14 12 24 22 34 32 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		

Flush Bezel

Control Boxes

Stop Switches Enabling

Safety Products Explosion Proof

Terminal Blocks

Relays & Sockets

LED Illumination

Controllers

Operator

Interfaces Sensors

AUTO-ID

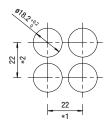
Circuit Protectors Power Supplies

Emergency

Switches

## Mounting Hole Layout / PC Board Drilling Layout

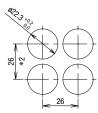
## LB Series Flush Bezel Round (LB6/LB6M)



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

## LBW Series Flush Bezel

#### Round (LBW6/LB6M/LBW6G)



\* 53 mm for switches with guard

## Panel Cut-out for Positioning

LB Series Flush Bezel







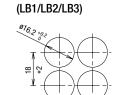
125V

3.5 A

2A

0.4A

0.2A



18

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

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



# ø22 ø30 Miniature

Pilot Lights

CW
LW-F
LB
LBW
UP

Flush Bezel

#### **CSA**

Rated

Operating

Current

UL

**Gold Contact** 

Silver Contact

Rated Operating Voltage

Rated Operating Current

**Rated Operating Voltage** 

AC

DC

#### **Gold Contact**

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

Approval Ratings and CCC Approval File No.

Res.

Ind.

Res

Ind.

30V DC

0.1A

30V

2, 3, 5A

1A

#### Silver Contact

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

#### CCC

Current

ΤÜV

Gold Contact

Silver Contact

Rated Operating

**Rated Operating Voltage** 

Rated Operating Current

**Rated Operating Voltage** 

AC-12

DC-12

#### Gold Contact

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

30V DC

0.1A (DC-12)

125V

3A

0.4A

30V

2, 5A

125V AC

0.1A (AC-12)

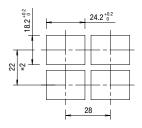
250V

2, 5A

#### Silver Contact

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

#### Rectangular (LB8/LB8M)



LB Series Standard Bezel

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

## Square (LBW7/LBW7M/LBW7G)

22.5 +0.2

22

Square (LB7/LB7M)

\$22

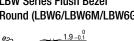
26

□18.2 <sup>+0.3</sup>

# 26

\* 53 mm for switches with guard

Round (LB6/LB6M)



125V AC

0.1A

250V

2, 3, 5A

1.5A

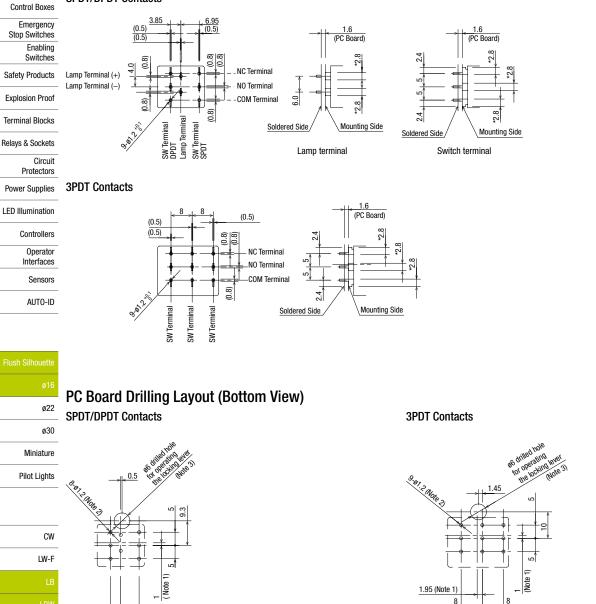
B-120

Download catalogs and CAD from http://eu.idec.com/downloads

## Notes for Designing PC Board and Circuit

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

#### SPDT/DPDT Contacts



Flush Bezel Note 1: When designing, note the alignment of center lines of the contact blocks and center lines of the operators. Note 2: The diameter of the terminal hole is ø1.2.

<u>6.95</u>

3.85

UP

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.

**3PDT Contacts** 

min

22

22 min

<u>-</u>0

18.2

mi.

20

min

22

23.2 min

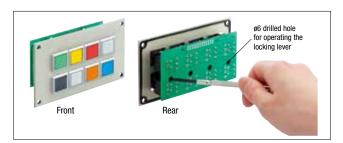
23.2 min

24.2 ±0.1

□18.2 ±0.1

## **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)



LBW Series Flush Bezel

(LBW6/LBW6M/LBW6G)

LB Series Flush Bezel (LB6/LB6M/LB6G)



28 min \* 45 mm minimum for switches with guard

LB Series Flush Bezel SPDT/DPDT Contacts

22 min

22 min

24.2 ±0.1

□18.2<sup>±0.1</sup>

LB6/LB6M/LB6G

Ø18,2

min

221

LB7/LB7M/LB7G

LB8/LB8M/LB8G

22 min

18.2 ±0.

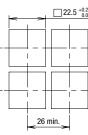
22 min

LBW Series Flush Bezel LBW6/LBW6M/LBW6G

# LBW Series Flush Bezela

28 min

## LBW7/LBW7M/LBW7G



UP

Flush Bezel

- 3. Turn the locking lever to lock the contact block.
- 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 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.



APEM

Control Boxes

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks Relays & Sockets

Circuit

Protectors Power Supplies

LED Illumination

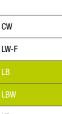
Controllers

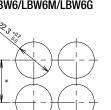
Operator Interfaces

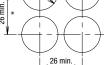
Sensors AUTO-ID

```
ø22
ø30
Miniature
```

Pilot Lights







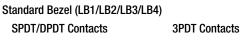
\* 53 mm minimum for switches with guard

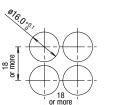
#### **Assembly Procedure**

- 1. Install the operator to the panel.
- 2. Mount the contact block to the operator from the rear.

- 4. Insert the PC board to terminals and solder.
- Note 3: Do not expose the contact block to water.





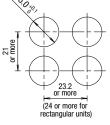


(24 or more for

rectangular units

**Mounting Hole Layout** 

SPDT/DPDT Contacts



Switche Pilot Lig Control Boxes Emergency Stop Switches Enabling Switches Safety Products Explosion Proof

Relays & Sockets

Protectors Power Supplies LED Illumination Controllers Operato Interfaces Sensors

# **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**

<u> </u>				
Color Code		Red (R), White (W)	G (Green)	
Rated Curren	t (I)	7mA	2mA	
	Reverse Voltage (V <sub>R</sub> )	9V	5V	
Maximum Current	Operating Temperature (Topr)	–25 to +55°C (no freezing)		
(Ta: 25°C)	Storage Temperature (Tstg)	-30 to +80°C (no freezing)		
Forward Voltage (V <sub>f</sub> )		Standard value: 2V (If=7mA)	Standard value: 2.7V (lf=2 mA)	
Dielectric Voltage		Between live and dead parts: 500V AC, 1 minute		
Weight (appr	ox.)	4.3g (UP8-89V1), 5.1g (UP8-89V2)		
	Rated Curren Maximum Current (Ta: 25°C) Forward Volta Dielectric Vol	Rated Current (I)       Maximum Current (Ta: 25°C)     Reverse Voltage (Va)       Operating Temperature (Topr)     Operating Storage Temperature (Tstg)       Forward Voltage (Vi)	Rated Current (I)     7mA       Maximum Current (Ta: 25°C)     Reverse Voltage (V <sub>R</sub> )     9V       Storage Temperature (T <sub>opr</sub> )     -25 to +55°C (no free -25 to +55°C (no free -30 to +80°C (no free Temperature (T <sub>stg</sub> )       Forward Voltage (V <sub>I</sub> )     Standard value: 2V (If=7mA)       Dielectric Voltage     Between live and dea 1 minute	

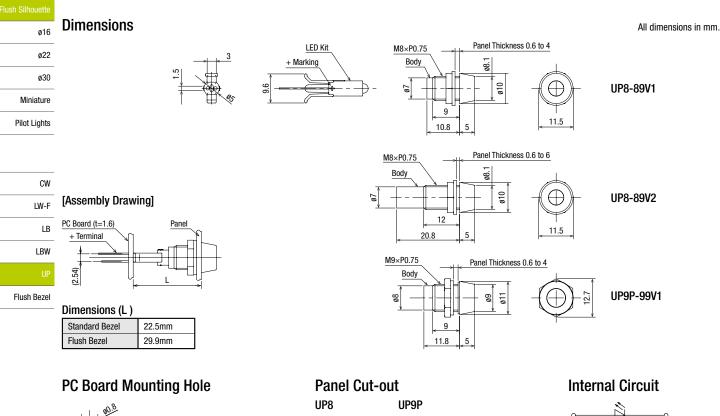


#### Terminal Blocks **UP Series**

	0. 0								
s & Sockets Circuit Protectors		Mounting Hole Size	Shape	Degree of Protection (IEC 60529)	Mountable Unit	Part No.	Ordering No.	Illumination Color Code	Package Quantity
ver Supplies	ø8 UP8	With standard bezel	Chanad		Standard Bezel	UP8-89V1*	UP8-89V1*PN10	Specify the color code	10
Controllers Operator Interfaces		With flush bezel	With flush bezel Shroud IP40	1P40	Flush Bezel	UP8-89V2*	UP8-89V2*PN10	in place of * in the Part No. G: green	10
Sensors AUTO-ID	ø9 UP9F		Shroud	IP65	Standard bezel Flush bezel	UP9P-99V1*	UP9P-99V1*PN10	R: red W: white	10

#### • LED cannot be replaced.

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







The longer pin is the positive terminal

## For more information, visit http://eu.idec.com

Control Boxes

Stop Switches

Safety Products

Explosion Proof

Terminal Blocks

Relavs & Sockets

Circuit

Protectors

Emergency

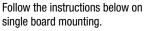
Enabling Switches

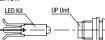
## Safety Precautions

- 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.

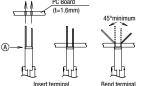
### Single Board Mounting

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





1. Mount the LED kit to the PC board.



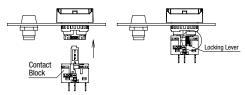
panel.

Temporary mounting

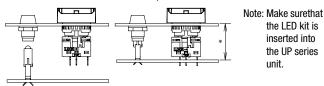
1. Note the polarity of the terminals and insert the terminals to the PC board. 2. Make sure that part A of the LED kit is pressed tightly to the PC board. Bend the terminals sideways as

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

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.



\* 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
0P9P-99V1*	Flush bezel	29.9mm

5. Solder the terminals.

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

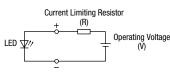
#### Instructions

#### Polarity

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

#### **Current Limiting Resistor**

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



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 (wh	ite) : 2V
	G (green)	: 2.7V

Note: Use a resistor of higher resistance than the calculated value  $(\Omega)$ 

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

#### <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.

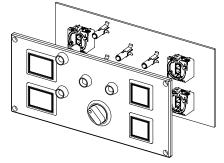
When soldering, do not touch the pilot light housing with the terminal. Do not bend the terminal or apply excessive force to the terminal.

#### 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

10 0 40 0	Power Supplies
<sup>90</sup> × 2 to 3 *	LED Illumination
is a safetv factor	

Controllers

```
Operator
Interfaces
Sensors
```

AUTO-ID

```
ø16
ø22
ø30
Miniature
Pilot Lights
CW/
```

000	
LW-F	
LB	
LBW	

Flush Bezel

## LB/LBW Series

APEM 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 Interfaces Sensors AUTO-ID

> ø22 ø30 Miniature Pilot Lights

> > CW LW-F

UP Flush Bezel

	Acc	essories						
					1	1		Package Quantity:1
	Shape			Specification	Part No.	Ordering No.	Package Quantity	Remarks
	ocking	Ring Wrench	€ 0.0	Metal (Nickel-plated brass)	MT-001	MT-001	1	Used to tighten the locking ring when installing the units on to the panel.
	Ler	ns Removal Tool	60.0	Stainless Steel	MT-101	MT-101	1	Used to remove the lens or button. (for standard bezels)
	(L	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 retur	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.
Ear Otherdard Darala	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.
	Ru	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	1. For round units (LB1)		LB9Z-D1	LB9Z-D1	1	
	3. Mounting Hole Plug		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	
			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.
	Mo	ounting Hole Plug	Rubber	Nitrile rubber (black)	AL-B6	AL-B6PN05	5	Degree of protection: IP65 See <mark>B-127</mark> for dimensions.

Accessories							8 Sé	
							Package Quantity:1	Pilot
	Shape		Specification	Part No.	Ordering No.	Package Quantity	Remarks	es & Pilot Lights
	Rubber Boot     ①	1. For round units (LB6/LB6M)		LB9Z-D6	LB9Z-D6	1		APEM
	®	2. For square units (LB7/LB7M)	Rubber (Transparent silicon rubber)	LB9Z-D7	LB9Z-D7	1	Degree of protection: IP65 See B-128 for dimensions. See B-135 for mounting.	Switches & Pilot Lights Control Boxes
Flush Bezels	3	3. For rectangular units (LB8/LB8M)		LB9Z-D8	LB9Z-D8	1		Emergency Stop Switches Enabling Switches
For LB Series I	Mounting Hole Plug	1. For round units (LB6/LB6M)	[Plug] Polyamide (Black)	LB9Z-BS6*	LB9Z-BS6*	1		Safety Products Explosion Proof 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 units (LB8/LB8M)	[Mounting Plate] Stainless Steel	LB9Z-BS8*	LB9Z-BS8*	1		Power Supplies
	Mounting Hole Plug	1. For round units (LBW6/LB6W6M)	[Plug] Polyamide (Black) [Gasket]	LBW9Z-BS6*	LBW9Z-BS6*	1	* Color code: blank (black), W (white) Degree of protection: IP65	Controllers Operator Interfaces Sensors
Bezels	<sup>2</sup>	2. For rectangular units (LBW7/LB6W7M)	[Mounting Plate] [Mounting 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 ø22
	Mounting Hole Plug	Rubber	Nitrile rubber	LW9Z-BP1	LW9Z-BP1	1	Degree of protection: IP65 Tightening torque: 2.0 N·m See B-128 for dimensions.	ø30 Miniature Pilot Lights
Terr ①	minal Cover 2	1. For SPDT/DPDT contacts	PBT	LB9Z-VL2	LB9Z-VL2PN10	10	See B-128 for dimensions.	CW
		2. For 3PDT contacts	(White)	LB9Z-VL3	LB9Z-VL3PN10	10	See B-131 for mounting.	LW-F
Key	Reversible key	For key selector switches (wave key)	Metal (zinc nickel-plated)	LA9Z-SK-*	LA9Z-SK-*PN02	2	Specify a key number in place of * in the Part No. Blank: Standard key 0H (reversible) 1H to 2H: Reversible key 3H to 6H: Non-reversible key See B-128 for dimensions.	LBW UP Flush Bezel
Key	s	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		



Switches

Circuit

Protectors

Controllers

Operator

Sensors AUTO-ID

Power Supplies

Pilot Lig Control Boxes Emergency Stop Switches Enabling

# For LB Series Standard Bezel

Rubber Boot For round units (LB9Z-D1)





## **Mounting Hole Plug**

AL-B6 Safety Products Explosion Proof Terminal Blocks Relays & Sockets



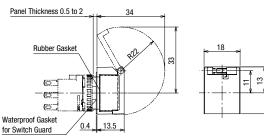
For square units

11.5

(LB9Z-D2)

□20

#### LED Illumination Switch Guard (Spring Return) For round / square units (AL-K6SP) Interfaces



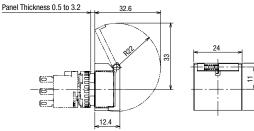
# ø22

ø30 Miniature

Pilot Lights

CW

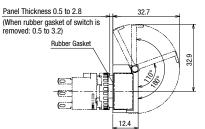
LW-F



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

## Switch Guard (Remains Open)

#### UP For round / square units (Note) (LB9Z-K2) Flush Bezel

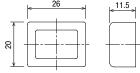




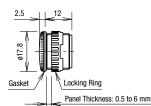
13

3.5

For rectangular units (LB9Z-D3)

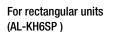


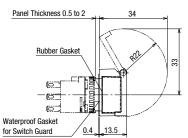
AL-BM6

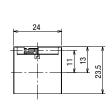


#### Mounting Hole Layout



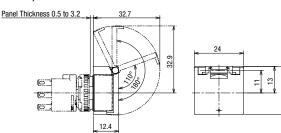






Note: The panel depth is the same for switches with or without switch guards. Both types can be installed on the same PC board.

#### For rectangular units (Note) (LB9Z-K3P)



#### **Switches & Pilot Lights 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) □24 30 APEM Control Boxes Emergency Stop Switches Enabling Switches **Mounting Hole Plug** Safety Products For round units Panel Thickness: 0.5 to 3.2 mm For square units For rectangular units Gasket Explosion Proof (LB9Z-BS6\*) (LB9Z-BS7\*) (LB9Z-BS8\*) Mounting Plate Locking Ring Terminal Blocks Relays & Sockets Circuit Protectors 18.1 2 Power Supplies **Mounting Hole Layout** Mounting Hole Layout Mounting Hole Layout LED Illumination L= □18.2<sup>+0.2</sup> 24.2 +0.2 Controllers $18.2^{+0.2}_{-0.2}$ Operator Interfaces Sensors AUTO-ID For LB Series Flush Bezel **Mounting Hole Plug** Metal (LW9Z-BM) Mounting Hole Layout Rubber (LW9Z-BP1) Mounting Hole Layout Rubber Gasket Panel Thicknes 0.8 to 6 12 3 .1 \$22.3<sup>492</sup> Locking Ring M12P:1 ø22 **25.8** ø30 Gasket Miniature Locking Ring 2 ( Pilot Lights For round units Mounting For round units Mounting Panel Thickness: 0.5 to 3.2 mm (LBW9Z-BS6\*) Hole Layout (LBW9Z-BS6\*) Hole Layout Gasket Mounting Plate 22.5<sup>+0.2</sup> Locking Ring CW LW-F 18.1 2 UP Key (Wave Key) **Terminal Cover** Flush Bezel For SPDT/DPDT contacts For 3PDT contacts Reversible key Non-reversible key (LB9Z-VL2) (LB9Z-VL3) 8.8 22 22 8.8 29.9 29.9 TOP TOP []]Deg DEG 4 4 ුධු 5 6.3 -5 Logo Side Logo Side Key No. Key No. -57 친권 0 Н ຊູ່ ω Η 12.5 12.5 24.8 196

Key No. Side

Key No. Side

## LB/LBW Series

#### Accessories

		Shape		Material / Dimensions (W×H×D)	Part No.	Ordering No.	Package Quantity	Remarks
ΙΓ	Lens		1. For round units	Polyarylate ø15.4 H4	AL6M-L*	AL6M-L*PN05	5	Specify the color code in place of * in the part no.
-	3 3.		2. For square units	Polyarylate □15.4 H4	AL6Q-L*	AL6Q-L*PN05	5	A: Amber, C: Clear, G: Green, R: Red, S: Blue, Y: Yellow
			3. For rectangular units	Polyarylate W21.4 H4 D15.4	AL6H-L*	AL6H-L*PN05	5	Note: Use a clear lens for pure white (PW)
		0	4. For dome units	Polyarylate ø16 H9.4	AL6D-L*	AL6D-L*PN05	5	illumination.
	Buttons	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		3. For rectangular units	Polyarylate W21.4 H4 D15.4	AB6H-B*	AB6H-B*PN05	5	W: White, Y: Yellow
Corioo	Markin	g plate	1. For round units	Acrylic ø13.7 H0.8	AL6M-*	AL6M-*PN05	5	Specify the color code in place of * in the part no.
	3		2. For square units	Acrylic D13.7 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.
_	Diffusio	on plate	For dome units	Acrylic ø13.6 H2.8	AL6D-W	AL6D-WPN05	5	White
-	Anti-rot	tation Ring	Standard bezel	Metal (Stainless steel) □17.9 t0.6	LB9Z-LP1	LB9Z-LP1PN10	10	
-	Anti-rot	tation 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, S: Blue, Y: Yellow
			2. For square flush units	Polyarylate ø20 H4	HA9Z-L21*	HA9Z-L21*PN05	5	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	3 (1)	1. For round flush units	Polyacetal ø20 H3.2 (L5)	HA9Z-B11*	HA9Z-B11*PN05	5	
DM Corioo			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.
DW	AMA 4	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	
	Markin	g 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 18.4 t0.85	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	
L	Locking ring All mo		All models	Polyamide ø17.9 H3.9	LB9Z-LN	LB9Z-LNPN10	10	
			Illuminated selector switches	<for operator=""> Polyarylate Waterproof O-gasket Nitryl rubber ø15.4 H13</for>	LA1A-F*	LA1A-F*PN02		Specify the color code in place of $*$ in the part no. G: green, R: red, W: white

APEM

ø22 ø30 Miniature Pilot Lights

> CW LW-F

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

Dookogo Quantitu:

All dimensions in mm.

## **Maintenance Parts**

## LB Series Maintenance LED Unit

Shape	Rated Operating Voltage	Part No. (Ordering No.)	* Color Code
LED Unit	5V DC	LB9Z-LED5*	A: Amber G: Green
-	12V AC/DC	LB9Z-LED1*	PW: Pure White R: Red
	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	Operating Voltage	Operating Voltage Range	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)
	400/440V AC	400/440V AC±10%	TWR542	

• Terminal cover (TWR-VL3) is supplied as standard.

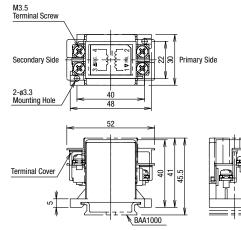
• Connect one LB9Z-LED2\* to a transformer.

### **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 M $\Omega$ 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 <sup>2</sup> Operating Extremes: 100 m/s <sup>2</sup>
Dielectric Strength	2,500V AC, 1 minute
Terminal Screw	M3.5
Applicable Wire	2 mm <sup>2</sup> maximum, 2 wires maximum
Weight (approx.)	87g

# **Dimensions**

Package Quantity: 1



## APEM

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## **Accessories**

#### 35mm DIN Rail

35mm DIN Rail					LW-F
Part No.	Ordering No.	Length	Material	Package Quantity	LB
BAA1000	BAA1000PN10	1,000mm	Aluminum (approx. 200g)	10	
BAP1000	BAP1000PN10	1,000mm	Steel (approx. 320g)	10	LBW
					UP

#### **End Clip**

						Flush Bezel
Part No.	Ordering No.	Applicable DIN Rail	Package Quantity	Dimensi	ions	
BNL6	BNL6PN10	BAA1000 BAP1000	10	(b2) 45 4	Approx. 15g Steel (Zinc-plated)	
BC9Z-E/NS35N	BC9Z-E/NS35NPN10	BAA1000 BAP1000	10		Approx. 15g	

• See H-071 for DIN rail products.

• Use end clip BC9Z-E/N35NPN10 when using 400/440V AC primary voltage transformers.



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#### 🔨 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.

#### 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**

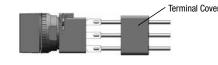
#### Solder/tab terminal

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

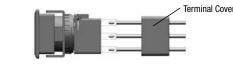
Note: When wiring, insert the lead wires into the terminal cover holes before soldering.

After wiring, the terminal covers cannot be installed.

#### Standard Bezel



#### Flush Bezel



#### **Operating Environment**

- Miniature
   • 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.

• 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.

## Handling

#### Contacts (micro switch)

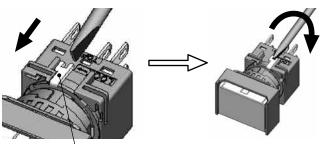
When using NC (normally closed) and NO (normally open) contacts of the same microswitch, avoid connections of different voltages, or connections of different types of power supplies. Failure to observe this instruction may cause a short-circuit.

#### Protection against oil (IP65)

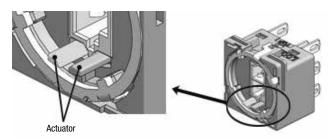
The LB series has been tested according to JIS C 0920: Appendix 1 by using water insoluble cutting oil Class N3, No. 8 (JIS K 2241) to prove that the switches will not be damaged by oil drops or splashes. This may not apply to special types of oils. Contact IDEC for details.

## **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.



Locking Lever



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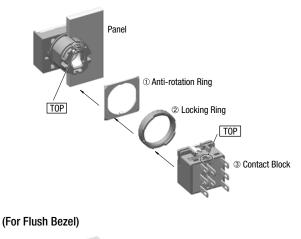
Switches

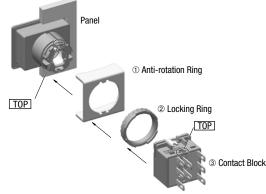
#### Instructions

#### **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)





#### 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)

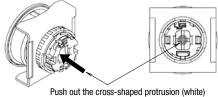
LBW series pushbuttons (button style, see **B-097**) can be removed according to the following procedure. LBW series pushbuttons (button style) cannot be removed from the front of the panel.

#### [Removing the Operator]

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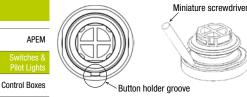
Circuit

Protectors

#### Instructions

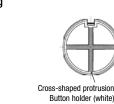
#### Removing the Button

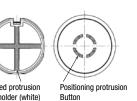
The button can be removed by inserting a small screwdriver into the groove of the button holder.



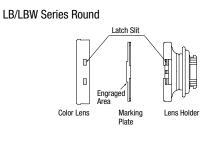
To attach the button to the button holder, align the groove on crossshaped protrusion with the positioning protrusion on the button and insert securely.

## Installing

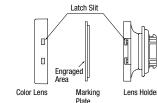




Insert the marking plate into the color lens, and press the lens onto the lens holder to engage the latches. Pay attention to the orientation of the marking plate.



#### LB Series Square/Rectangular



Marking

Plate

Lens Holder

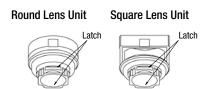
# LBW Series Square

Color Lens

UP Flush Bezel

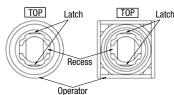
# Installing the Lens Unit and Contact Block

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.

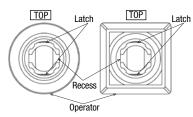


Standard Bezel

Button holder (white)



Flush Bezel

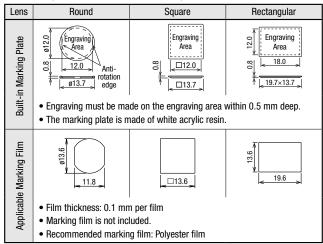


## Marking Plates and Films

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.

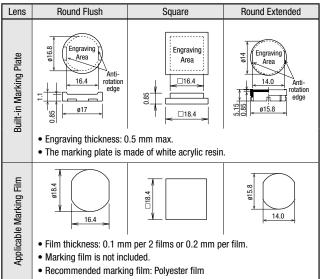
#### Marking Plate and Marking Film Size

#### LB Series (flush bezel / standard bezel)

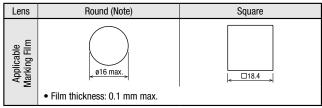


#### Instructions

#### LBW Series

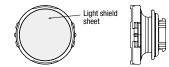


#### LBW Series (ring-illuminated model)



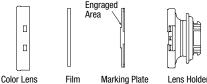
Use a film with adhesive and attach on the light shield sheet. Make sure Note: that the marking film is properly installed and does not protrude from the edge of light shield sheet.

#### **Ring Illuminated Model Lens Holder**

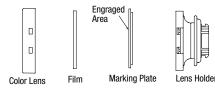


#### Insertion Order of Marking Plate and Film

#### LB/LBW Series Round



#### 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.

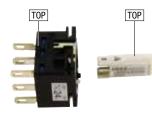




Contact Block

#### 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

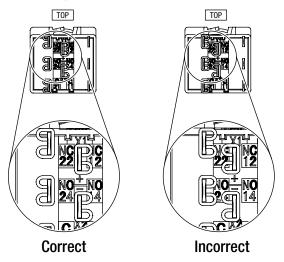
When replacing the LED unit, make sure that static electricity is not applied.

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

#### Notes on Using Quick Connect Terminals

1) Use #110 tab guick connects, 0.5 mm-thick.

2) When connecting the terminals on the left and center, make sure that surfaces of the quick connects face each other. Otherwise, short-circuit may occur.



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

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LB
LBW
UP
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## LB/LBW Series

#### Instructions

#### Installing the Rubber Boot

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

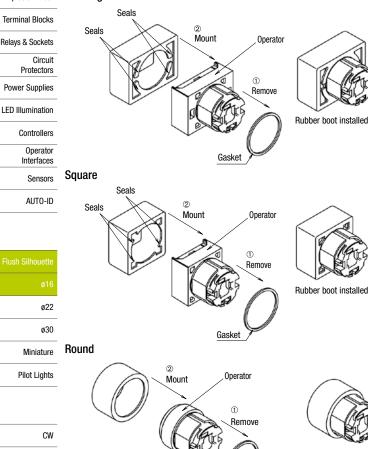
As shown in the drawing below, remove the gasket from the operator, and attach the rubber boot from the front (button side).

#### **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

#### Explosion Proof Rectangular



Gasket

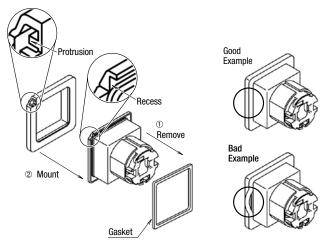
Rubber boot installed

#### 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

Observe the following instructions to prevent malfunction or damage.

- Do not stop halfway when operating pushbuttons or illuminated pushbuttons. Make sure to push the button fully.
- Do not replace the operator or lens unit with the pushbutton in a locked status.
- Do not remove the contact unit with the pushbutton in a locked status.
- Do not operate the pushbutton without the contact unit.

# 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  $180^{\circ}$ . 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.

LW-F

UP

Flush Bezel

APEM

Control Boxes

Emergency

Enabling

Switches Safety Products

Stop Switches

Rubber Gasket when using LB9Z-K2 Switch Guard (remains

Choose to use or not to use the rubber gasket for the switch referring

w/rubber gasket

Remove the rubber gasket from the switch and install the switch

Remove the rubber gasket from the switch and install the switch

w/o rubber gasket

onto the switch guard, and mount on the panel (discard the rubber

w/o rubber gasket

onto the switch guard, and mount on the panel (discard the rubber

to the conditions described below. Note that the degree of protection is

open) for Round/Square Units

mount on the panel.

gasket).

gasket).

Single board mounting

IP40 with or without the rubber gasket.

 $(\Box$ 

. When the panel thickness is 2.8 to 3.2mm

• When the panel thickness is up to 2.8mm

# APEM

Install the switch onto the switch quard with rubber gasket, and Control Boxes



Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies



Controllers

Operator Interfaces

Sensors

AUTO-ID

ø22 ø30 Miniature Pilot Lights

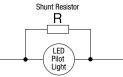
CW
LW-F
LB
LBW
UP
Flush Bezel

SEUEN01A\_B LB April 2020

#### Countermeasures against Dim Lighting

Leakage currents through transistors or a contact protection circuit may cause the LED lamp to illuminate dimly even when the output is off.

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

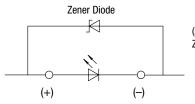


#### Leakage Current Shunt Resistor Allotment Table (Recommended)

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

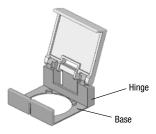
## Static Electricity (UP Series)

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.



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