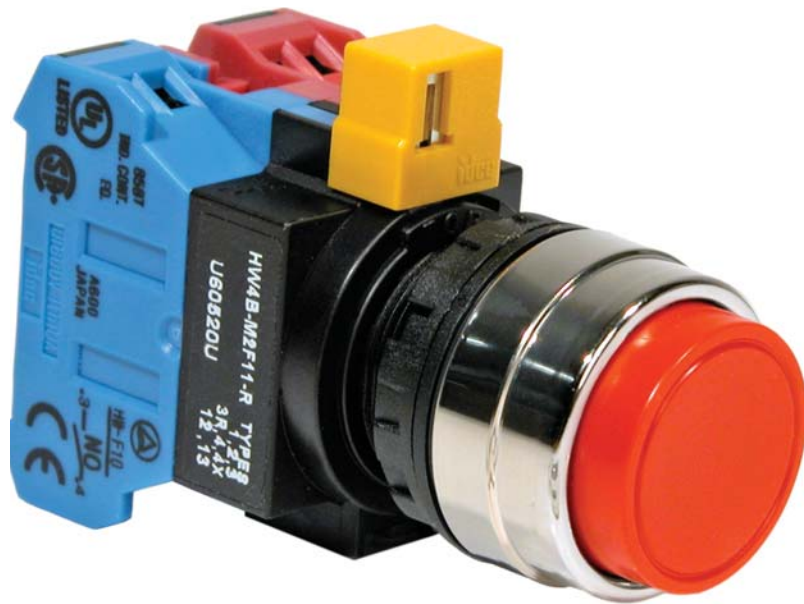


# Switches & Pilot Devices



Selection Guide.....	440
Miniature Switches & Pilot Devices.....	442
<b>NEW</b> AP Series ø8-16mm .....	442
A8 Series ø8mm.....	446
ø16mm Switches & Pilot Devices.....	451
<b>NEW</b> XA E-Stops ø16mm .....	451
A6 Series ø16mm.....	457
L6 Series ø16mm .....	471
ø22mm Switches & Pilot Devices.....	494
<b>NEW</b> XW E-Stops ø22mm .....	494
HW Series ø22mm .....	500
TW Series ø22mm .....	561
<b>NEW</b> FB Series Enclosures.....	602
ø30mm Switches & Pilot Devices.....	604
<b>NEW</b> XN E-Stops ø30mm .....	604
TWTD Series ø30mm .....	610
Cam Switches - CS Series .....	640
Mono-Lever Switches - ARN Series.....	647
<b>NEW</b> LW Silhouette Series .....	650



For more information on this product family, visit our website.

Additional resources include:

- New and updated product information
- Downloadable software demos & upgrades
- Part configuration tool & cross reference
- Online stock check & ordering
- IDEC field sales & distributor search
- Online literature request
- Downloadable manuals & CAD drawings
- Manufacturer's suggested retail price list
- Product training schedule & locations
- Advertising & trade show schedules
- Press releases & FAQs

[www.idec.com/switches](http://www.idec.com/switches)

Selection Guide

Appearance	Product Series	Mounting Hole	Contact rating	Contact	Function	Page
	AP	ø8mm, ø10mm, ø12mm, ø16mm	N/A	N/A	Pilot light	442
	A8	ø8mm	1A	Fixed	Pushbutton, Pilot Light	446
	XA		5A	Removable	E-Stop	451
	A6	ø16mm	1A	Fixed	Pushbutton, Pilot Light, Selector Switch, Key Switch, E-Stop	457
	L6		5A	Removable	Pushbutton, Pilot Light, Selector Switch, Key Switch, E-Stop, Buzzer	471
	XW		5A	Removable	E-Stop	494
	HW		10A	Removable	Pushbutton, Pilot Light, Selector Switch, Key Switch, E-Stop, MonoLever	500
	TW	ø22mm	10A	Removable	Pushbutton, Pilot Light, Selector Switch, Key Switch, E-Stop	561
	FB		N/A	N/A	Enclosures	602

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

Selection Guide con't

Appearance	Product Series	Mounting Hole	Contact rating	Contact	Function	Page
	XN	ø30mm	5A	Removable	E-Stop	604
	TWTD		10A	Removable	Pushbutton, Pilot Light, Selector Switch, Key Switch, E-Stop	610
	CS		10A	fixed	Cam Switch	640
	ARN		10A	Removable	MonoLever	647
	LW Silhouette		ø25mm, □ 25 x 25mm	5A	Removable	Pushbutton, Pilot Light, Selector Switch, Key Switch

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

## AP Series – Miniature Pilot Lights

### Key features:

- Long service life, low maintenance
- Space saving miniature style
- Dome or flat lens models
- Built-in current-limiting resistor
- Five illumination colors: red, green, amber, yellow, and white
- Transformer (120V AC and 240V AC) and DC-DC Converter (110V DC) options on 12mm and 16mm units



UL Recognized  
File No. E55996



CSA Certified  
File No. LR21451



\*AP8/AP1 series only.

### Specifications

<b>Lamp</b>	Built-in LED with current limiting resistor
<b>Operational Voltage</b>	5, 6, 12, 24VDC (full voltage), 110/120, 220/240VAC, (with transformer) 110VDC (with converter)
<b>Current Ratings</b>	AP8: 5V DC/9mA, 12V DC/9mA, 24V DC/9mA, 12V AC/15mA, 24V AC/15mA AP1: 5V DC/9mA, 12V DC/9mA, 24V DC/9mA, 12V AC/15mA, 24V AC/15mA AP2: 6V DC/33mA, 12V DC/22mA, 24V DC/11mA AP6: 6V DC/33mA, 12V DC/22mA, 24V DC/11mA
<b>Operating Temp.</b>	-20°C to +55°C
<b>Operating Humidity</b>	45 to 85% RH
<b>Insul. Resistance</b>	100MΩ min. (500V DC megger) Between live and dead parts
<b>Rev. Withstand Voltage</b>	AP2/AP6: 100V AP1/AP8: 200V
<b>Solder Terminal</b>	Soldering 260°C maximum (5 sec.)
<b>Degree of Protection</b>	AP8: IP40 (dustproof) Other Series: IP65 (oiltight)

### Optional Adaptors/Converters

	Transformer	DC-DC Converter
<b>Applicable Units</b>	AP2 & AP6 (with 6V LED only)	
<b>Operating Voltage</b>	110/120VAC 50/60 Hz 220/240VAC 50/60 Hz	110V DC (90 to 140V DC)
<b>Power Consumption</b>	1.6 VA maximum	1W maximum
<b>Insulation Voltage</b>	250 V AC	140V DC
<b>Insulation Resistance</b>	10MΩ min. (500V DC megger) Between live and dead parts	
<b>Dielectric Strength</b>	2,000V AC, 1 minute Between live/dead parts 2,000V AC, 1 minute Between terminals	2,000V AC, 1 minute Between live/dead parts 1,500V AC, 1 minute Between terminals



Available as one piece only (replacement LEDs are not available).

Miniature Pilot Lights

AP Miniature Pilot Lights - ø8 & ø10mm

Appearance	Lens Style	Operating Voltage	Part Numbers
 AP8 Series - ø8mm	Dome	5V DC +/- 5% 12V AC/DC +/- 10% 24V AC/DC +/- 10%	AP8M255-Ⓢ AP8M211-Ⓢ AP8M222-Ⓢ
	Flat	5V DC +/- 5% 12V AC/DC +/- 10% 24V AC/DC +/- 10%	AP8M155-Ⓢ AP8M111-Ⓢ AP8M122-Ⓢ
 AP1 Series - ø10mm	Dome	5V DC +/- 5% 12V AC/DC +/- 10% 24V AC/DC +/- 10%	AP1M255-Ⓢ AP1M211-Ⓢ AP1M222-Ⓢ
	Flat	5V DC +/- 5% 12V AC/DC +/- 10% 24V AC/DC +/- 10%	AP1M155-Ⓢ AP1M111-Ⓢ AP1M122-Ⓢ

Ⓢ Color Codes

Color	Code
Amber	A
Green	G
Red	R
Blue	S*
Warm White	W
Cool White	PW
Yellow	Y

- 1. In place of Ⓢ, specify the color code.
- 2. For dimensions, see page 445.
- 3. For accessories, see page 444.

AP Miniature Pilot Lights - ø12 & ø16mm


Appearance	Lens Style	Operating Voltage	Part Numbers
 AP2 Series - ø12mm	Dome	6V DC +/- 5% 12V DC +/- 10% 24V DC +/- 10%	AP2M266-Ⓢ AP2M211-Ⓢ AP2M222-Ⓢ
	Flat	6V DC +/- 5% 12V DC +/- 10% 24V DC +/- 10%	AP2M166-Ⓢ AP2M111-Ⓢ AP2M122-Ⓢ
 AP6 Series - ø16mm	Dome	6V DC +/- 5% 12V DC +/- 10% 24V DC +/- 10%	AP6M266-Ⓢ AP6M211-Ⓢ AP6M222-Ⓢ
	Flat	6V DC +/- 5% 12V DC +/- 10% 24V DC +/- 10%	AP6M166-Ⓢ AP6M111-Ⓢ AP6M122-Ⓢ

Ⓢ Color Codes

Color	Code
Amber	A
Green	G
Red	R
Warm White	W
Yellow	Y

- 1. In place of Ⓢ, specify the color code.
- 2. For dimensions, see page 445.
- 3. For accessories, see page 444.

Optional Transformers and DC-DC Converters (for AP2 and AP6 only)

Appearance	Style	Voltage	Part Numbers	
			Used with AP2 Series	Used with AP6 Series
	Transformer	110/120V AC 220/240V AC	AP2-0126D AP2-0246D	AP6-0126D AP6-0246D
	DC-DC Converter	110V DC (90–140V DC)	AP2-016DD	AP6-016DD

- 1. Optional Transformers and DC-DC converters snap onto the back of AP2 or AP6 pilot lights.
- 2. Transformers and DC-DC Converters step down to 6V.
- 3. For dimensions, see page 445.

Switches & Pilot Lights

Display Lights



Relays & Sockets


Timers

Terminal Blocks

Circuit Breakers


## Accessories – AP Series

Appearance	Description	Used With	Part Number
Locking Ring Wrench 	Made of metal. Used for tightening plastic locking ring during installation. Tightening torque should not exceed 3kgf-cm	Ø 16mm units	MT-001
		Ø 12mm units	MT-002
		Ø 10mm units	MT-003
		Ø 8mm units	MT-004
Mounting Hole Plug 	Made of rubber. Fills unused mounting holes to provide IP65 protection	Unused 8mm panel cutouts	AL-B8
		Unused 10mm panel cutouts	AL-B1
		Unused 12mm panel cutouts	AL-B2
		Unused 16mm panel cutouts	AL-B6
Transformer Removal Tool 		AP2 and AP6 snap on transformer and DC-DC converter	MT-100
Replacement Lenses 	Lenses (included with all units).	AP1M Flat	AP1M-L1-Ⓢ
		AP1M Dome	AP1M-L2-Ⓢ
		AP2M Flat	AP2M-L1-Ⓢ
		AP2M Dome	AP2M-L2-Ⓢ
		AP6M Flat	AP6M-L1-Ⓢ
		AP6M Dome	AP6M-L2-Ⓢ
Replacement Engraving Inserts 	Allow legends under flat lenses (included with all flat lens models).	AP1M Flat	AP1M-PN1W
		AP2M Flat	AP2M-P1-W
		AP6M Flat	AP6M-P1-W

- 
 1. In place of Ⓢ, specify the Lens Color Code.  
 2. Internal LED is fixed and cannot be removed or replaced.

## Ⓢ Lens Color Codes

Color	Code
Amber	A
Green	G
Red	R
Blue	S*
White	W
Yellow	Y

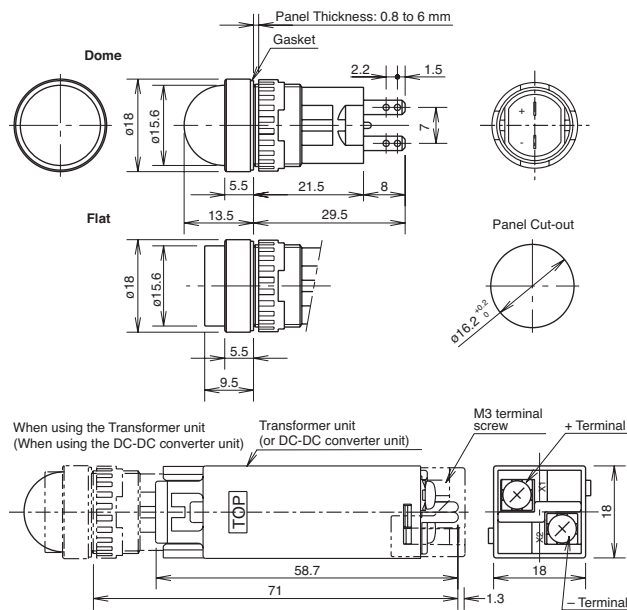

 \*Blue available in AP8/AP1 series only.

Dimensions – AP Series

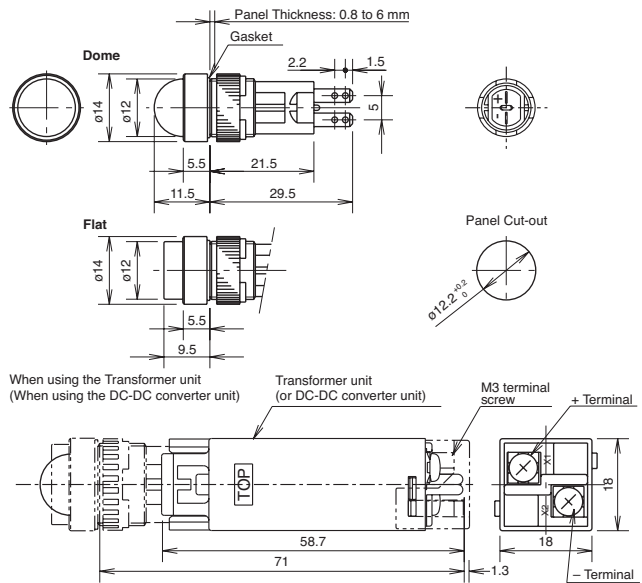
Pilot Lights (AP Series)

Style	AP8		AP1		AP2			AP6		
	Flat	Dome	Flat	Dome	Flat	Dome	w/ Adaptor or Converter	Flat	Dome	w/ Adaptor or Converter
Panel Cut-out	Ø 0.319" (+0.0118, -0) 8.1mm (+0.3, -0)		Ø 0.398" (+0.0118, -0) 10.1mm (+0.3, -0)		Ø 0.480" (+0.0118, -0) 12.2mm (+0.3, -0)			Ø 0.638" (+0.0118, -0) 16.2mm (+0.3, -0)		
Outside Dimension	Ø 0.386" (9.8mm)		Ø 0.472" (12mm)		Ø 0.551" (14mm)		□ 0.709" (18mm)	Ø 0.709" (18mm)		□ 0.709" (18mm)

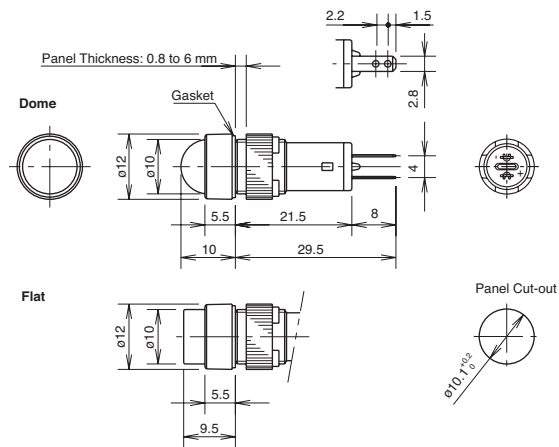
AP6



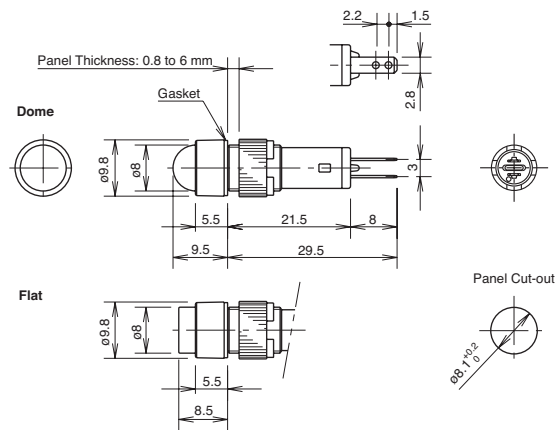
AP2



AP1



AP8



Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers



## A8 Series — Miniature Switches and Pilot Devices: 8mm

**Key features:**

- 21/64" (8mm) round mounting hole
- Compact Design Saves Space
- Bright and Vivid Illumination
- Choice of Shapes and Functions
- Gold Clad Silver Contacts for reliable low level switching
- Snap action contacts
- IP40 (Dustproof) Construction


**Specifications**

<b>LED Lamp Life</b>	50,000 hours approximately (reduced to half of original intensity)
<b>Contact Configuration</b>	SPDT
<b>Maximum Voltage</b>	250V AC/DC
<b>Thermal Current</b>	3A
<b>Contact Material</b>	Gold-clad Silver
<b>Terminal Style</b>	Solder Tab Terminal
<b>Operating Temperature</b>	-25° to +55°C (no freezing)
<b>Operating Humidity</b>	45 to 85% RH
<b>Contact Resistance</b>	50mΩ maximum (initial value)
<b>Insulation Resistance</b>	100MΩ minimum (500V DC megger)
<b>Vibration Resistance</b>	5 to 55Hz, 0.75mm amplitude
<b>Shock Resistance</b>	Damage limits: 500m/sec <sup>2</sup> (approx. 50G) Operating extremes: 200m/sec <sup>2</sup> (approx. 20G)
<b>Electrical Life</b>	100,000 operations minimum
<b>Mechanical Life</b>	Maintained: 100,000 (1200 operations/hour) Momentary: 200,000 minimum
<b>Degree of Protection</b>	IP40 Enclosed/Dustproof
<b>Soldering Temperature</b>	20W/5 seconds or 260°C/3 seconds
<b>Dielectric Strength</b>	Switch Unit: 2,000V AC, 1 min. between live/dead part and terminals of different poles; 1,000V AC, 1 minute between terminals of the same pole; 1,500V AC, 1 minute between contact and lamp terminals. Illumination Unit: 2,000V AC, 1 min. between live part/ground

**Contact Ratings**

Operating Voltage		24V	120V	240V
AC 50/60Hz	Resistive	—	1.0A	0.5A
	Inductive	—	0.7A	0.5A
DC	Resistive	1.0A	0.2A	—
	Inductive	0.7A	0.1A	—

1. AC Inductive Load, PF = 0.6 – 0.7; DC Inductive Load, L/R = 7.
2. Minimum applicable load (reference value) is 5V AC/DC 3mA (applicable range is subject to the operating conditions and load).

Switches &amp; Pilot Lights

Display Lights

Relays &amp; Sockets

Timers

Terminal Blocks

Circuit Breakers



AB8 Non-Illuminated Pushbuttons (Assembled)

Non-Illuminated Pushbuttons

Style	Contact	Part Numbers	
		Momentary	Maintained
Round 	SPDT	AB8M-M1-⓪	AB8M-A1-⓪
Square 	SPDT	AB8Q-M1-⓪	AB8Q-A1-⓪
Rectangular 	SPDT	AB8H-M1-⓪	AB8H-A1-⓪

- 1. In place of ⓪, specify button color code from the table below.
- 2. For accessories, see page 449.
- 3. For dimensions, see page 450.

⓪ Button Color Codes

Color	Code
Black	B
Green	G
Red	R
Blue	S
White	W
Yellow	Y

## AL8 Illuminated Pushbuttons &amp; Pilot Lights (Assembled)

## Illuminated Pushbuttons

Style	Contact	Part Numbers		Pilot Light Part Number
		Momentary	Maintained	
Round 	SPDT	AL8M-M11-Ⓞ	AL8M-A11-Ⓞ	AL8M-P1-Ⓞ
Square 	SPDT	AL8Q-M11-Ⓞ	AL8Q-A11-Ⓞ	AL8Q-P1-Ⓞ
Rectangular 	SPDT	AL8H-M11-Ⓞ	AL8H-A11-Ⓞ	AL8H-P1-Ⓞ

## Ⓞ LED/Lens Color Codes

Color	Code
Amber	A
Green	G
Red	R
White	W
Yellow	Y

- In place of Ⓞ, specify lens color code from table on the right.
- A replaceable LED lamp is included with the operator.
- Because the LED lamp does not contain an internal current limiting resistor, an external resistor must be added. For recommended values, see table below.
- For accessories, see page 449.
- For dimensions, see page 450.

## Replacement LEDs

Lens Color	LED Lamp	Part Number
Amber	Amber	LAD-SA
Green	Green	LAD-SG
Red	Red	LAD-SR
White	Yellow*	LAD-SY
Yellow	Yellow	LAD-SY

\* White units use a white lens and a yellow LED.

## LED Voltage and Recommended Current Limiting Resistor

Voltage	External Resistor
5V DC	150Ω, 1/2W
6V DC	200Ω, 1/2W
12V DC	510Ω, 3/4W
24V DC	1.1kΩ, 3/4W

## LED Lamp Ratings: LED Specifications

LED Lamp	Forward Current $I_f$	Forward Voltage (Nominal) $V_f$	Reverse Voltage $V_r$	Operating Voltage & External Current Limiting Resistor (Recommended Value)
Amber	20mA	2.2V	4V	5V DC: 150Ω, 1/2w 6V DC: 200Ω, 1/2w 12V DC: 510Ω, 3/4w 24V DC: 1.1kΩ, 3/4w
Green	20mA	2.1V	4V	
Red	20mA	1.7V	4V	
Yellow	20mA	2.2V	4V	

When LED lamps are used at voltages other than those stated above, external resistor value, R, is determined by the following formula:  $R = (\text{Operating Voltage} - V_f) / I_f$

Switches &amp; Pilot Lights

Display Lights


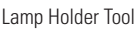


Relays &amp; Sockets

Timers

Terminal Blocks

Circuit Breakers

Accessories

Appearance	Description	Used With	Part Number	
 Locking Ring Wrench	Made of metal. Used for tightening plastic locking ring during installation. Tightening torque should not exceed 3kgf-cm	All units	MT-004	
 Lens Removal Tool	Made of metal. Used for removing lens or button from the housing	Illuminated pushbuttons and pilot lights	MT-101	
 Lamp Holder Tool	Made of rubber. Used for removing and replacing LED lamps in illuminated units	Illuminated pushbuttons and pilot lights	OR-66	
 Switch Guard	Used to avoid operating the pushbutton inadvertently. Cover flips open 90°. Provides IP40 protection	Round & square units	AL-K8	
		Rectangular units	AL-KH8	
 Terminal Cover	Made of translucent nylon. Fits over and shields the terminals	All units	AL-V8	
 Adaptor Socket <small>AL-C8      AL-C8V shown attached</small>	Plug-on adaptor with solder terminals, allows easy control unit replacement. Plug-on adaptor with PCB terminals, allows easy control unit replacement.	All units	AL-C8	
			AL-C8V	
 Mounting Hole Plug	Made of rubber. Fills unused mounting holes to provide IP65 protection	Extra panel cutouts	AL-B8	
 Replacements LEDs	LED lamp is included in every illuminated control unit. Replacement lamp is ordered separately. External current limiting resistor required.	Illuminated units and pilot lights	LAD-SR (red)	
			LAD-SG (green)	
			LAD-SA (amber)	
			LAD-SY (yellow)	
 Replacement Engraving Inserts		Illuminated pushbuttons and pilot lights	Round	AL8M-W
			Square	AL8Q-W
			Rectangular	AL8H-W
 Replacement Lenses		Illuminated pushbuttons and pilot lights	Round	AL8M-LK1-②
			Square	AL8Q-LK1-②
			Rectangular	AL8H-LK1-②
 Replacement Buttons		Non-Illuminated buttons	Round	AB8M-BK1-①
			Square	AB8Q-BK1-①
			Rectangular	AB8H-BK1-①

- 1. In place of ①, specify Button Color Code from the table.
- 2. In place of ②, specify Lens Color Code from table.

① Button Color Codes

Color	Code
Black	B
Green	G
Red	R
Blue	S
White	W
Yellow	Y

② LED/Lens Color Codes

Color	Code
Amber	A
Green	G
Red	R
White	W
Yellow	Y

Switches & Pilot Lights

Display Lights

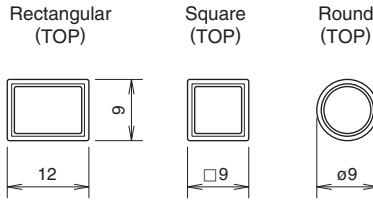
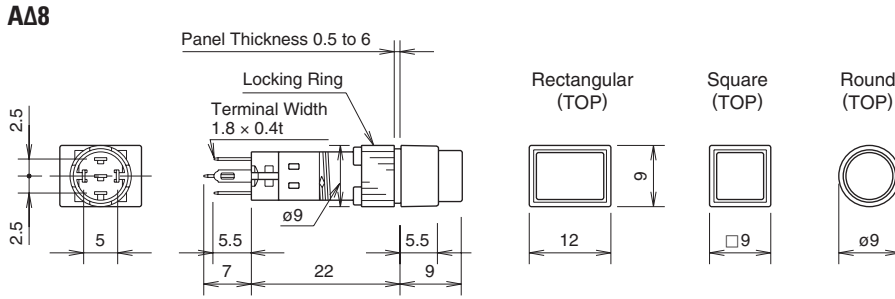
Relays & Sockets

Timers

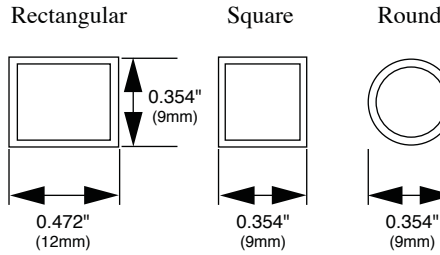
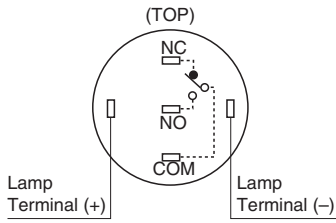
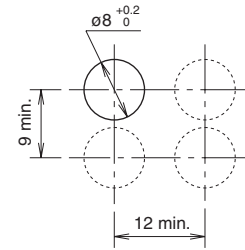
Terminal Blocks

Circuit Breakers

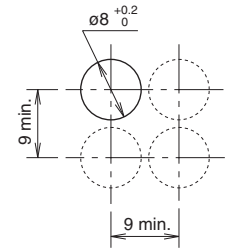
**Dimensions**



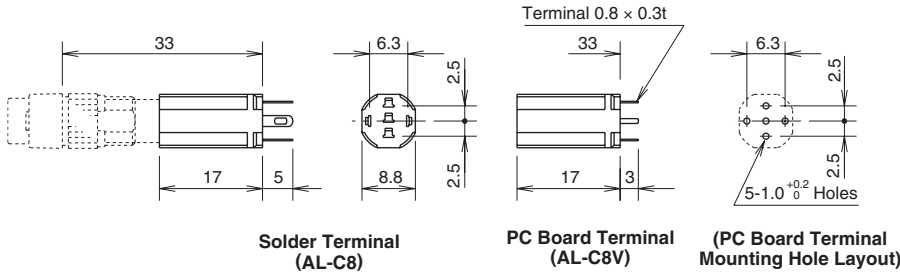
**Panel Cut-Out (not drawn to scale)**  
**Rectangular**



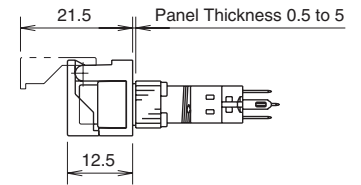
**Round/Square**



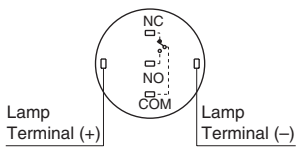
**Terminal Sockets**



**Switch Guard, Ø 21/64" (8mm)**

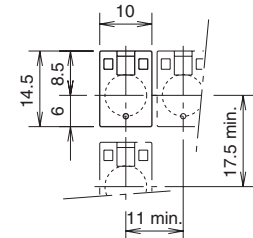


**Terminal Arrangement (TOP)**

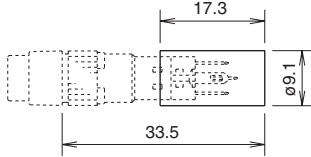


**(Bottom View)**

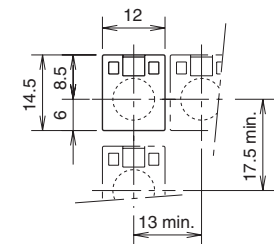
**For Round/Square Units (AL-K8)**



**Terminal Cover AL-V8, Ø 21/64" (8mm)**



**For Rectangular Units (AL-KH8)**



Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

## 16mm XA E-Stops

### Key features:

- Lead-free, RoHS compliant, (EU directive 2002/95/EC)
- The depth behind the panel is only 27.9mm for 1 to 4 contacts, illuminated and non-illuminated types.
- IDEC's original "Safe break action" ensures that the NC contacts open when the contact block is detached from the operator.
- 1 to 4NC main contacts and 1NO monitor contact
- Push-to-lock, Pull or Turn-to-reset operator
- Direct opening action mechanism (IEC60947-5-5, 5.2, IEC60947-5-1, Annex K)
- Safety lock mechanism (IEC60947-5-5, 6.2)
- Degree of protection IP65 (IEC60529)
- Two button sizes:  $\varnothing 29$  and  $\varnothing 40$ mm
- UL, c-UL recognized. EN compliant
- UL NISD2 category emergency stop button (File# E305148)




CCC No. 2005010305150899

### Specifications

<b>Applicable Standards</b>	IEC60947-5-1, EN60947-5-1, IEC60947-5-5, EN60947-5-5 UL508, CSA C22.2 No. 14
<b>Operating Temperature</b>	Non-illuminated: -25 to +60°C (no freezing), Illuminated: -25 to +55°C (no freezing)
<b>Operating Humidity</b>	45 to 85% RH (no condensation)
<b>Storage Temperature</b>	-45 to +80°C
<b>Operating Force</b>	Push-to-lock: 10.5N Pull-to-reset: 10N Turn-to-reset: 0.16N·m
<b>Minimum Force Required for Direct Opening Action</b>	60N
<b>Min Operator Stroke Required for Direct Opening Action</b>	4mm
<b>Maximum Operator Stroke</b>	4.5mm
<b>Contact Resistance</b>	50m $\Omega$ maximum (initial value)
<b>Contact Material</b>	Gold plated silver
<b>Insulation Resistance</b>	100M $\Omega$ minimum (500V DC megger)
<b>Impulse Withstand Voltage</b>	2.5kV
<b>Pollution Degree</b>	3 (inside LED unit: 2)
<b>Operation Frequency</b>	900 operations/hour
<b>Shock Resistance</b>	Operating extremes: 150m/s <sup>2</sup> (15G), Damage limits: 1000m/s <sup>2</sup> (100G)
<b>Vibration Resistance</b>	Operating extremes: 10 to 500Hz, amplitude 0.35mm acceleration 50m/s <sup>2</sup> Damage limits: 10 to 500Hz, amplitude 0.35mm acceleration 50m/s <sup>2</sup>
<b>Mechanical Life</b>	250,000 operations minimum
<b>Electrical Life</b>	100,000 operations minimum, (250,000 operations minimum @ 24V AC/DC, 100mA)
<b>Degree of Protection</b>	IP65 (IEC60529)
<b>Terminal Style</b>	Solder terminal, PC board terminal
<b>Recommended Tightening Torque for Locking Ring</b>	0.88N·m
<b>Wire Size</b>	16 AWG max
<b>Soldering Conditions</b>	310 to 350°C, 3 seconds maximum
<b>Weight</b>	$\varnothing 29$ mm: 23g $\varnothing 40$ mm: 28g

Part Numbers

Non-Illuminated XA E-Stop

Operator	Termination	Monitor Contacts	Main Contacts	Part Number
 29mm Mushroom	PCB Terminal	1NO	1NC	XA1E-BV311V-R
		-	2NC	XA1E-BV302V-R
		1NO	3NC	XA1E-BV313V-R
		-	4NC	XA1E-BV304V-R
	Solder Terminal	1NO	1NC	XA1E-BV311-R
		-	2NC	XA1E-BV302-R
		1NO	3NC	XA1E-BV313-R
		-	4NC	XA1E-BV304-R
 40mm Mushroom	PCB Terminal	1NO	1NC	XA1E-BV411V-R
		-	2NC	XA1E-BV402V-R
		1NO	3NC	XA1E-BV413V-R
		-	4NC	XA1E-BV404V-R
	Solder Terminal	1NO	1NC	XA1E-BV411-R
		-	2NC	XA1E-BV402-R
		1NO	3NC	XA1E-BV413-R
		-	4NC	XA1E-BV404-R

Illuminated XA E-Stop

Operator	Termination	Monitor Contacts	Main Contacts	Part Number
 29mm Mushroom	PCB Terminal	1NO	1NC	XA1E-LV311Q4V-R
		-	2NC	XA1E-LV302Q4V-R
		1NO	3NC	XA1E-LV313Q4V-R
		-	4NC	XA1E-LV304Q4V-R
	Solder Terminal	1NO	1NC	XA1E-LV311Q4-R
		-	2NC	XA1E-LV302Q4-R
		1NO	3NC	XA1E-LV313Q4-R
		-	4NC	XA1E-LV304Q4-R
 40mm Mushroom	PCB Terminal	1NO	1NC	XA1E-LV411Q4V-R
		-	2NC	XA1E-LV402Q4V-R
		1NO	3NC	XA1E-LV413Q4V-R
		-	4NC	XA1E-LV404Q4V-R
	Solder Terminal	1NO	1NC	XA1E-LV411Q4-R
		-	2NC	XA1E-LV402Q4-R
		1NO	3NC	XA1E-LV413Q4-R
		-	4NC	XA1E-LV404Q4-R



All illuminated XA E-Stops come with a replaceable 24V AC/DC LED.

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

**Contact Ratings**

<b>Rated Insulation Voltage (Ui)</b>		300V (illuminated part: 60V)					
<b>Rated Current (Ith)</b>		5A					
<b>Rated Operating Voltage (Ue)</b>		30V	125V	250V			
Rated Operating Current	Main Contacts (NC)	AC 50/60Hz	Resistive Load (AC-12)	–	3A	3A	
			Inductive Load (AC-15)	–	1.5A	1.5A	
	DC		Resistive Load (DC-12)	2A	0.4A	0.2A	
			Inductive Load (DC-13)	1A	0.22A	0.1A	
	Monitor Contacts (NO)	AC 50/60Hz		Resistive Load (AC-12)	–	1.2A	0.6A
				Inductive Load (AC-14)	–	0.6A	0.3A
DC			Resistive Load (DC-12)	2A	0.4A	0.2A	
			Inductive Load (DC-13)	1A	0.22A	0.1A	

Minimum applicable load: 5V AC/DC, 1mA (reference value).  
The rated operating currents are measured at resistive/inductive load types specified in IEC 60947-5-1.

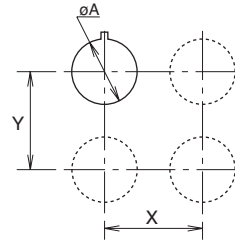
**Illuminated Unit LED Ratings**

Operating Voltage	Current
24V AC/DC ±10%	11mA

**Depth Behind the Panel**

Depth (mm)	Description
27.9	1 - 4 contacts, both illuminated and non-illuminated

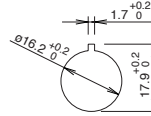
**Mounting Hole Layout**



Measurements

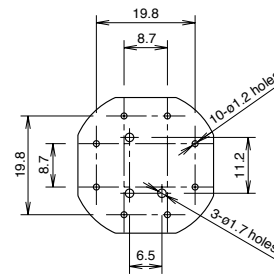
Model	øA	X & Y
ø29mm	16.2 <sup>+0.2</sup>	40mm min
ø40mm		50mm min

**Panel Cutout**

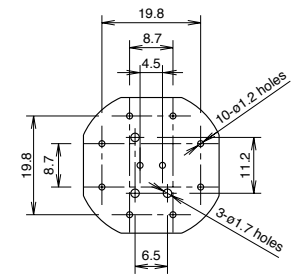


**PC Board Layout - Bottom View**

Non-Illuminated



Illuminated



**Part Number Key**

**XA1E - L V 3 11 Q4 V - R**

**Illumination**

B: Non-Illuminated  
L: Illuminated

**Contact Configuration**

11: 1NO - 1NC  
02: 2NC  
13: 1NO - 3NC  
04: 4NC

**Terminal**

Blank: solder tab  
V: PCB

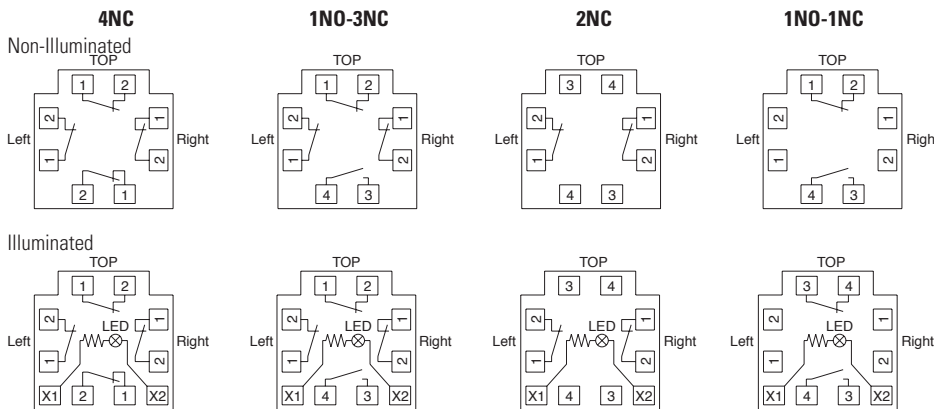
**Mushroom Size**

3: ø29mm  
4: ø40mm

**Voltage Code**

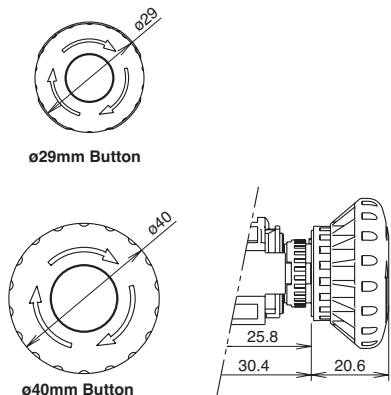
Blank: Non-illuminated  
Q4: Illuminated 24V AC/DC

**Terminal Arrangements (Bottom View)**

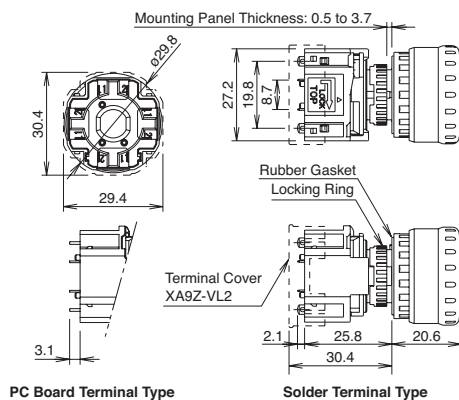




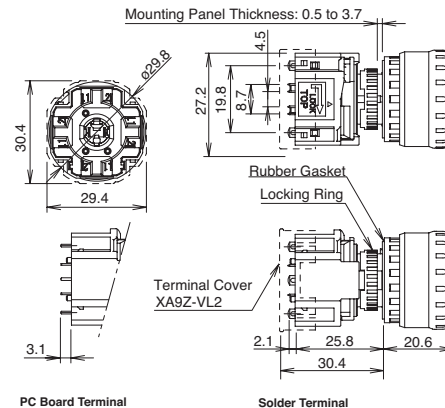
Dimensions (mm)



Non-Illuminated



Illuminated



Accessories

Description	Part Numbers
Replacement LED Unit: Solder Terminal	XA9Z-LED2R
Replacement LED Unit: PCB Terminal	XA9Z-LED2VR
Terminal Cover for contact block (solder terminal only)	XA9Z-VL2

Accessories: Shroud

Part Number	Applicable Standards
XA9Z-KG1	SEMI S2 Compliant (Approved by TUV)

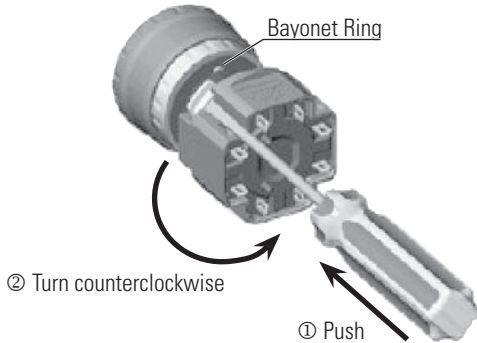
Accessories: Nameplates

Legend	Part Number	Inner Ø	Outer Ø	Available E-Stop Mushroom Size
(blank)	HAAV-0	16mm	43mm	29mm
"Emergency Stop"	HAAV-27	16mm	43mm	
(blank)	HAAV4-0	16mm	60mm	40mm
"Emergency Stop"	HAAV4-27	16mm	60mm	

### Operating Instructions

#### Removing the Contact Block

First unlock the operator button. While pushing up the white bayonet ring, using a small screwdriver (width: 2.5 to 3 mm) if necessary, turn the contact block counterclockwise and pull out. **Do not exert excessive force when using a screwdriver, otherwise the bayonet ring may be damaged.**

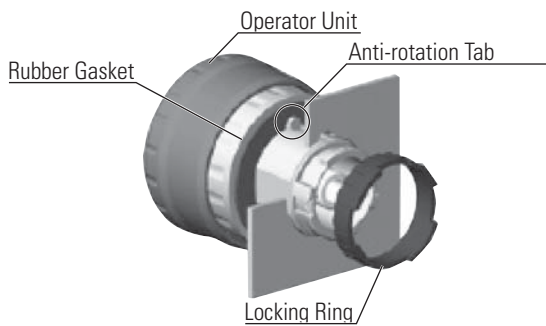


#### Notes for Removing the Contact Block

1. When the contact block is removed, the monitor contact (NO contact) is closed.
2. While removing the contact block, do not exert excessive force, otherwise the switch may be damaged.

#### Panel Mounting

Remove the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from panel front into the panel hole. Face the side with the anti-rotation tab on the operator upward, and tighten the locking ring.

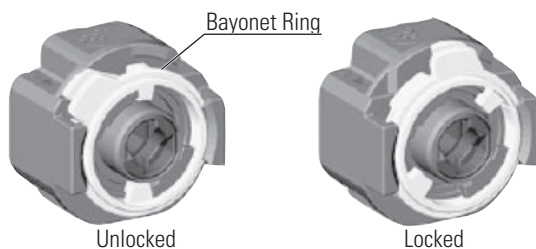


#### Notes for Panel Mounting

To mount XA emergency stop switches onto a panel, tighten the locking ring to a tightening torque of 0.88 N·m maximum using ring wrench MT-001. Do not use pliers. Do not exert excessive force, otherwise the locking ring may be damaged.

#### Installing the Contact Block

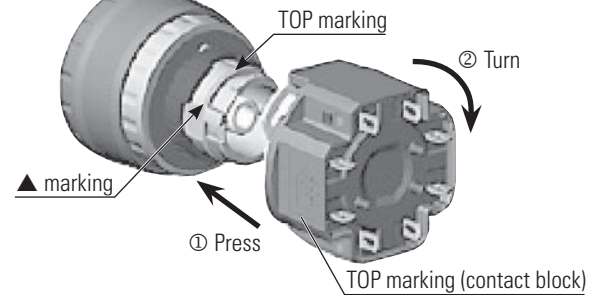
First turn the bayonet ring to the unlocked position.



Align the small ▲ marking on the edge of the operator base with the TOP marking on the contact block. Press the contact block onto the operator and turn the contact block clockwise until the bayonet ring clicks.

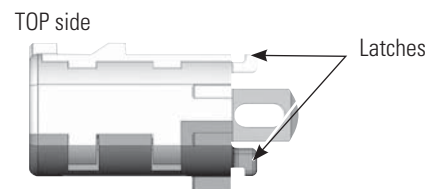
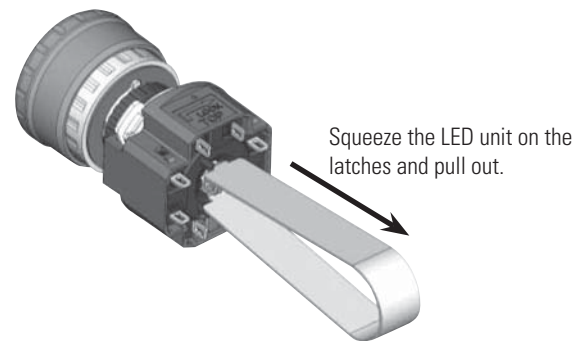
#### Notes for Installing the Contact Block

Check that the contact block is securely installed on the operator. When the emergency stop switch is properly assembled, the bayonet ring is in place as shown below.



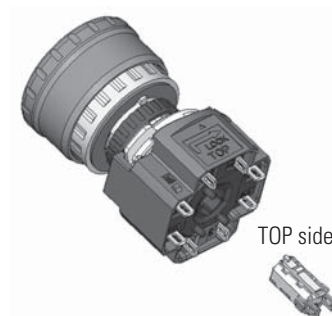
#### Removing the LED Unit

Pull out the LED unit while squeezing the latches on the LED unit using the LED unit removal tool (MT-101).



#### Installing the LED Unit

Align the top of the LED unit with the TOP marking on the contact block. Push the LED unit into the contact block.



Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

Operating Instructions, continued

Wiring

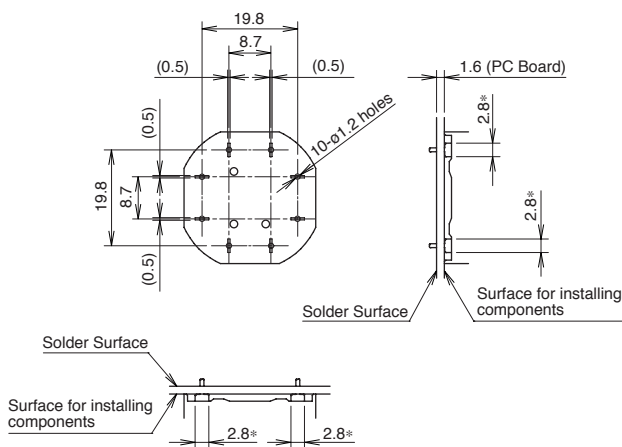
1. The applicable wire size is 16 AWG maximum.
2. Solder the terminal at a temperature of 310 to 350°C within 3 seconds using a soldering iron. Sn-Ag-Cu solder is recommended. When soldering, do not touch the switch with the soldering iron. Also ensure that no tensile force is applied to the terminals. Do not bend the terminals or apply excessive force to the terminals.
3. Use a non-corrosive rosin flux.
4. Because the terminal spacing is narrow, use protective tubes or heat shrinkable tubes to avoid burning of wire coating or short circuit.

PC Board Terminal Type

1. When mounting a contact block on a PC board, provide sufficient rotating space for the PC board when installing and removing the contact block.
2. When mounting an XA emergency stop switch on a PC board, make sure that the operator is securely installed.

About PC Board and Circuit Design

1. Use PC boards made of glass epoxy copper-clad laminated sheets of 1.6 mm in thickness, with double-sided through holes.
2. PC boards and circuits must withstand rated voltage and current, including instantaneous current and voltage at switching.
3. The minimum applicable load is 5V AC/DC, 1 mA.
4. Within the 2.8\* mm areas shown in the figure below, terminals touch the PC board, resulting in possible short circuit on the printed circuit. When designing a PC board pattern, take this possibility into consideration.

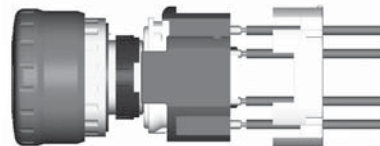


All dimensions in mm.

Installing Insulation Terminal Cover

To install the terminal cover (XA9Z-VL2), align the TOP marking on the terminal cover with TOP marking on the contact block, and press the terminal cover toward the contact block.

Note: For wiring, insert the wires into the holes in the terminal cover before soldering.



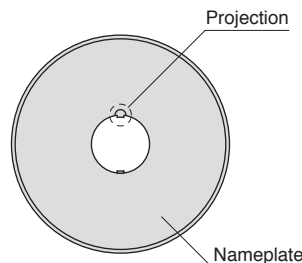
Contact Bounce

When the button is reset by pulling or turning, the NC main contacts will bounce. When pressing the button, the NO monitor contacts will bounce.

When designing a control circuit, take the contact bounce time into consideration (reference value: 20 ms).

Nameplate

When anti-rotation is not required, remove the projection from the nameplate using pliers.



Handling

Do not expose the switch to excessive shock and vibration, otherwise the switch may be deformed or damaged, causing malfunction or operation failure.



Safety Precautions

- Turn off power to the XA series emergency stop switch before starting installation, removal, wiring, maintenance, and inspection of the relays. Failure to turn power off may cause electrical shock or fire hazard.
- Use the LED unit removal tool when replacing the LED unit to avoid burning your hands.
- Use wires of the proper size to meet the voltage and current requirements, and solder the wires correctly. If soldering is incomplete, the wire may heat during operation, causing a fire hazard.

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

## A6 Series – Miniature Switches and Pilot Devices: 16mm

**Key features:**

- 16mm (5/8") mounting hole
- LED illumination
- Compact design saves space
- Momentary, Maintained, Selectors, and E-Stops
- Gold-clad Silver contacts for reliable low level switching
- Snap action contacts
- IP40 (dustproof) or IP65 (oiltight) versions



<b>Specifications</b>	<b>Degree of Protection</b>	IP40: Dustproof IP65 Watertight/Oiltight			
	<b>Contact Configuration</b>	SPDT, DPDT			
	<b>Maximum Voltage</b>	250V AC/DC			
	<b>Thermal Current</b>	3A			
	<b>Minimum Applicable Load</b>	5V AC/DC, 1mA			
	<b>Contact Material</b>	Gold-clad silver			
	<b>Terminal Style</b>	.110" Solder/ Quick Connect			
	<b>Operating Temperature</b>	-25° to +55°C (no freezing)			
	<b>Operating Humidity</b>	45 to 85% RH			
	<b>Contact Resistance</b>	50mΩ maximum (initial value)			
	<b>Insulation Resistance</b>	100MΩ minimum (500V DC megger)			
	<b>Vibration Resistance</b>	10 to 55Hz, amplitude 1.5mm p-p			
	<b>Shock Resistance</b>	Damage limits: 500m/sec <sup>2</sup> (approx. 50G) Operating extremes: 200m/sec <sup>2</sup> (approx. 20G)			
<b>Electrical Life</b>	100,000 operations minimum (at full rated load)				
<b>Mechanical Life</b>	Maintained: 100,000 operations minimum Momentary: 1,000,000 operations minimum Selector/Keylock: 250,000 operations minimum				
<b>Dielectric Strength</b>	Switch Unit: 2,000V AC, 1 min. between live/dead part and terminals of different poles; 1,000V AC, 1 minute between terminals of the same pole; 1,500V AC, 1 minute between contact and lamp terminals. Illumination Unit: 2,000V AC, 1 min. between live part/ground				
<b>Soldering Temperature</b>	20W/5 seconds or 260°C/3 seconds				
<b>Contact Ratings</b>	<b>Operating Voltage</b>	24V	120V	240V	
	<b>AC (50/60Hz)</b>	<b>Resistive</b>	—	1.0A	0.5A
		<b>Inductive</b>	—	0.7A	0.5A
	<b>DC</b>	<b>Resistive</b>	1.0A	0.2A	—
<b>Inductive</b>		0.7A	0.1A	—	
<b>LED Lamp Ratings</b>	<b>Rated Voltage/Current</b>	5V DC ±5%	6V AC/DC (±10%)	12V AC/DC (±10%)	24V AC/DC (±10%)
		8mA	AC: A, R, W, Y: 8mA G, S: 7mA DC: A, R, W, Y: 6mA G, S: 5mA	AC: 9mA DC: 8mA	AC: 9mA DC: 8mA



1. AC Inductive Load, PF = 0.6 – 0.7; DC Inductive Load, L/R = 7ms.
2. LED lamp contains a built-in current limiting resistor and a protection diode.
3. LED's don't "burn out." Luminance is reduced to 50% of initial intensity after being lit for 50,000 hours continuously.

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

**AB6 Non-Illuminated Pushbuttons (Assembled)**

**Non-Illuminated Pushbuttons**

Style	Contact	Part Number			
		Momentary		Maintained (Latching)	
		Dustproof (IP40)	Oiltight (IP65)	Dustproof (IP40)	Oiltight (IP65)
Round 18mm 	SPDT DPDT	AB6M-M1-⓪ AB6M-M2-⓪	AB6M-M1P-⓪ AB6M-M2P-⓪	AB6M-A1-⓪ AB6M-A2-⓪	AB6M-A1P-⓪ AB6M-A2P-⓪
Square 18mm 	SPDT DPDT	AB6Q-M1-⓪ AB6Q-M2-⓪	AB6Q-M1P-⓪ AB6Q-M2P-⓪	AB6Q-A1-⓪ AB6Q-A2-⓪	AB6Q-A1P-⓪ AB6Q-A2P-⓪
Rectangular 18mm x 24mm 	SPDT DPDT	AB6H-M1-⓪ AB6H-M2-⓪	AB6H-M1P-⓪ AB6H-M2P-⓪	AB6H-A1-⓪ AB6H-A2-⓪	AB6H-A1P-⓪ AB6H-A2P-⓪
Round 23.5mm 	SPDT DPDT	-	AB6M-M1P-M⓪ AB6M-M2P-M⓪	-	AB6M-A1P-M⓪ AB6M-A2P-M⓪
Square 23.5mm 	SPDT DPDT	-	AB6Q-M1P-Q⓪ AB6Q-M2P-Q⓪	-	AB6Q-A1P-Q⓪ AB6Q-A2P-Q⓪
Rectangular 17.5 X 23.5mm 	SPDT DPDT	-	AB6Q-M1P-H⓪ AB6Q-M2P-H⓪	-	AB6Q-A1P-H⓪ AB6Q-A2P-H⓪


**⓪ Button Color Code**

Color	Code
Black	B
Green	G
Red	R
Blue	S
White	W
Yellow	Y



1. In place of ⓪, specify Button Color Code from the table at right.
2. To order as sub-assembled, see page 459.
3. For accessories, see page 466.
4. For dimensions, see page 468.

**AB6-V Pushlock Turn Reset**

Shape	Operation	Contact	Part Number		Remarks
			Dustproof (IP40)	Oiltight (IP65)	
23.5mm Round Mushroom 	Pushlock Turn Reset	SPDT DPDT	AB6M-V1-R AB6M-V2-R	AB6M-V1P-R AB6M-V2P-R	1. Button available in red only. 2. Replacement button: order AB6M-V-R

**Buzzer**

Style	Shape	Voltage	Part Number
	Round (18mm)	12V DC	UZ6-11
		24V DC	UZ6-12

**Buzzer Ratings**

Frequency	2 kHz ± 500 Hz
Amplitude	80db @ 0.1m (at rated voltage)
Operating Voltage	6V AC/DC or 12 - 24V AC/DC ± 10%
Adjustable Cycle	55 to 600 cycles per minute
Current Draw	DC: 7mA, AC: 20mA
Life	1000 hrs. minimum
Insulation Voltage	60V AC/DC
Operating Temperature	-20 to 55 C (no freezing), 45 to 85% rh

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers


Terminal Blocks


Circuit Breakers

AB6 Non-Illuminated Pushbuttons (Sub-Assembled)



Operators

Style	Contact	Operator	Part Number		
			Round	Square	Rectangular
Non-Illuminated Pushbuttons 	SPDT	Momentary	AB6M-M100	AB6Q-M100	AB6H-M100
		Maintained	AB6M-A100	AB6Q-A100	AB6H-A100
	DPDT	Momentary	AB6M-M200	AB6Q-M200	AB6H-M200
		Maintained	AB6M-A200	AB6Q-A200	AB6H-A200


 Oversize rectangular button uses square operator.

Buttons

Description	Part Number	
	Button	
	Dustproof (IP40)	Oiltight (IP65)
Round 	AB6M-BK1-①	AB6M-BK2-①
Square 	AB6Q-BK1-①	AB6Q-BK2-①
Rectangular 	AB6H-BK1-①	AB6H-BK2-①
Round Oversize 	—	AB6M-BK2-M①
Square Oversize 	—	AB6Q-BK2-Q①
Rectangular Oversize 	—	AB6Q-BK2-H①

① Button Color Code

Color	Code
Black	B
Green	G
Red	R
Blue	S
White	W
Yellow	Y

-  1. In place of ①, specify Button Color Code from table.  
 2. Buttons which are rated IP65 include a waterproof rubber gasket.  
 3. For accessories, see page 466.



**AL6 Illuminated Pushbuttons (Assembled)**

**LED Illuminated Pushbuttons**

Description	Style	Contact	Part Numbers			
			Momentary		Maintained (Latching)	
			Dustproof (IP40)	Oiltight (IP65)	Dustproof (IP40)	Oiltight (IP65)
<b>Standard Lens</b> 	Round (18mm lens)	SPDT DPDT	AL6M-M1③-② AL6M-M2③-②	AL6M-M1③P-② AL6M-M2③P-②	AL6M-A1③-② AL6M-A2③-②	AL6M-A1③P-② AL6M-A2③P-②
	Square (18mm lens)	SPDT DPDT	AL6Q-M1③-② AL6Q-M2③-②	AL6Q-M1③P-② AL6Q-M2③P-②	AL6Q-A1③-② AL6Q-A2③-②	AL6Q-A1③P-② AL6Q-A2③P-②
	Rectangular (18mm x 24mm lens)	SPDT DPDT	AL6H-M1③-② AL6H-M2③-②	AL6H-M1③P-② AL6H-M2③P-②	AL6H-A1③-② AL6H-A2③-②	AL6H-A1③P-② AL6H-A2③P-②
<b>Oversize Lens</b> 	Round (24mm lens)	SPDT DPDT	-	AL6M-M1③P-M② AL6M-M2③P-M②	-	AL6M-A1③P-M② AL6M-A2③P-M②
	Square (24mm lens)	SPDT DPDT	-	AL6Q-M1③P-Q② AL6Q-M2③P-Q②	-	AL6Q-A1③P-Q② AL6Q-A2③P-Q②
	Rectangular (18mm x 24mm lens)	SPDT DPDT	-	AL6Q-M1③P-H② AL6Q-M2③P-H②	-	AL6Q-A1③P-H② AL6Q-A2③P-H②

- 1. In place of ②, specify Lens/LED Color Code from table below.
- 2. In place of ③, specify Voltage Code from table below.
- 3. Lamps also available in 5V DC, 6V AC/DC or 12 V AC/DC, change "4" using voltage/lamp codes (ie AL6M-M13-② uses 12V AC/DC LED).
- 4. LED lamp is included in unit and contains a current-limiting resistor and a protection diode. (External resistor not required.)
- 5. To order as sub-assembled, see page 461.
- 6. For accessories, see page 466.
- 7. For dimensions, see page 468.
- 8. Light independent of switch position.

**② Lens/LED Color Code**

Color	Code
Amber	A
Green	G
Red	R
Blue	S
Warm White	W
Cool White	JW
Yellow	Y

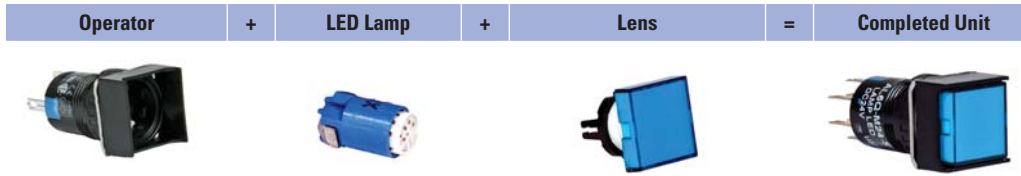
**③ Voltage Code**

Voltage	Code
5V DC	1
6V AC/DC	2
12V AC/DC	3
24V AC/DC	4

Switches & Pilot Lights  
Display Lights  
Relays & Sockets  
Timers  
Terminal Blocks  
Circuit Breakers



AL6 Illuminated Pushbuttons (Sub-Assembled)



Operators

Style	Contact	Operator	Part Number		
			Round	Square	Rectangular
AL6 Illuminated Pushbuttons 	SPDT	Momentary	AL6M-M100	AL6Q-M100	AL6H-M100
		Maintained	AL6M-A100	AL6Q-A100	AL6H-A100
	DPDT	Momentary	AL6M-M200	AL6Q-M200	AL6H-M200
		Maintained	AL6M-A200	AL6Q-A200	AL6H-A200

Oversize rectangular button uses square operator.

Lenses

Unit	Part Number		
	Dustproof (IP40)	Oiltight (IP65)	
	Standard	Standard	Oversize
Round	AL6M-LK1-Ⓢ 	AL6M-LK2-Ⓢ 	AL6M-LK2-M Ⓢ 
Square	AL6Q-LK1-Ⓢ 	AL6Q-LK2-Ⓢ 	AL6Q-LK2-Q Ⓢ 
Rectangular	AL6H-LK1-Ⓢ 	AL6H-LK2-Ⓢ 	AL6Q-LK2-H Ⓢ 

- 1. In place of Ⓢ, specify Lens Color Code from table below.
- 2. Lenses which are rated IP65 include a waterproof rubber gasket.
- 3. For accessories, see page 466.

Ⓢ Lens/LED Color Code

Color	Code
Amber	A
Green	G
Red	R
Blue	S
Warm White	W
Cool White	JW
Yellow	Y

LED Lamps

Appearance	Rated Voltage	Part Number
	5V DC	LATD-5 Ⓢ
	6V AC/DC	LATD-6 Ⓢ
	12V AC/DC	LATD-1 Ⓢ
	24V AC/DC	LATD-2 Ⓢ

- 1. In place of Ⓢ, specify LED Color Code from table at left.

**AL6 Pilot Lights (Assembled)**

**LED Pilot Lights**

Description	Part Number	
	Dustproof (IP40)	Oiltight (IP65)
Round (18mm Lens) 	AL6M-P③-②	AL6M-P③P-②
Square (18mm Lens) 	AL6Q-P③-②	AL6Q-P③P-②
Rectangular (18mm x 24mm Lens) 	AL6H-P③-②	AL6H-P③P-②

- 1. In place of ②, specify Lens Color Code from table below.
- 2. In place of ③, specify Voltage Code from table below.
- 3. LEDs also available in 5V DC, 6V AC/DC or 12 V AC/DC, change "4" using voltage codes (ie AL6M-P3-② uses 12V AC/DC LED).
- 4. LED is included and contains built-in current limiting resistor and reverse polarity protection diode. (no external resistor required)
- 5. To order sub-assembled, see page 463.
- 6. For accessories, see page 466.
- 7. For dimensions, see page 468.
- 8. For one piece pilot lights and/or dome lens pilot lights, see AP series miniature pilot lights.

**② Lens/LED Color Code**

Color	Code
Amber	A
Green	G
Red	R
Blue	S
Warm White	W
Cool White	JW
Yellow	Y

**③ Voltage Code**

Voltage	Code
5V DC	1
6V AC/DC	2
12V AC/DC	3
24V AC/DC	4

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

AL6 Pilot Lights (Sub-Assembled)



Operators

Style	Part Number		
	Round	Square	Rectangular
AL6 Pilot Lights 	AL6M-P00	AL6Q-P00	AL6H-P00

Lenses

Degree of Protection	Part Number	
	Dustproof IP40	Oiltight IP65
Round	AL6M-LK1-Ⓢ 	AL6M-LK3-Ⓢ 
Square	AL6Q-LK1-Ⓢ 	AL6Q-LK3-Ⓢ 
Rectangular	AL6H-LK1-Ⓢ 	AL6H-LK3-Ⓢ 

- 1. In place of Ⓢ, specify Lens Color Code from table below.
- 2. Lenses which are rated IP65 include a waterproof rubber gasket.
- 3. For accessories, see page 466.

Ⓢ Lens/LED Color Code

Color	Code
Amber	A
Green	G
Red	R
Blue	S
Warm White	W
Cool White	JW
Yellow	Y

LED Lamps

Appearance	Rated Voltage	Part Number
	5V DC	LATD-5 Ⓢ
	6V AC/DC	LATD-6 Ⓢ
	12V AC/DC	LATD-1 Ⓢ
	24V AC/DC	LATD-2 Ⓢ

- 1. In place of Ⓢ, specify LED Color Code from table at left.

Switches & Pilot Lights

Display Lights

Relays & Sockets





Timers

Terminal Blocks

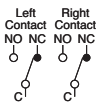
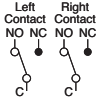
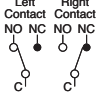
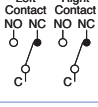
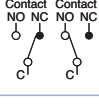
Circuit Breakers

AS6 Selector and Keylock Switches

AS6 Selector Switches and Keylock Switches (2 & 3 Position)


Style	Function	Knob	Key
Round Selector 	2-Position 90° Maintained		AS6M-2Y2P
	2-Position 90° Spring Return Right		AS6M-21Y2P
Round Keylock 	3-Position 45° Maintained		AS6M-3Y2P
	3-Position 45° Spring Return Right → Center		AS6M-31Y2P
	3-Position 45° Spring Return Left → Center		AS6M-32Y2P
Square Selector 	2-Position 90° Maintained		AS6Q-2Y2P
	2-Position 90° Spring Return to Right		AS6Q-21Y2P
Square Keylock 	3-Position 45° Maintained		AS6Q-3Y2P
	3-Position 45° Spring Return Right → Center		AS6Q-31Y2P
	3-Position 45° Spring Return Left → Center		AS6Q-32Y2P
Rectangular Selector 	2-Position 90° Maintained		AS6H-2Y2P
	2-Position 90° Spring Return Right		AS6H-21Y2P
Rectangular Keylock 	3-Position 45° Maintained		AS6H-3Y2P
	3-Position 45° Spring Return Right → Center		AS6H-31Y2P
	3-Position 45° Spring Return Left → Center		AS6H-32Y2P
Round Selector 	2-Position 90° 2-Way Return → Center		AS6M-33Y2P
	2-Position 90° 2-Way Return → Center		AS6M-33KT2P
2-Position 90° 2-Way Return → Center		AS6Q-33Y2P	AS6Q-33KT2P
2-Position 90° 2-Way Return → Center		AS6Q-33Y2P	AS6Q-33KT2P
2-Position 90° 2-Way Return → Center		AS6H-33Y2P	AS6H-33KT2P

Contact Operations (for all selectors)

Contents	Operator Position & Contact Operation
2-pos. (DPDT)	Left 
	Right 
3-pos. (DPDT)	Left 
	Center 
	Right 

Key Retention Codes

Code	Description
A	Key not retained in any position (removable in all positions)
B	Key retained in right position only
C	Key retained in left position only
D	Key retained in left and right (3 position only)
E	Key retained in center only (3 position only)
G	Key retained right and center (3 position only)
H	Key retained left and center (3 position only)

 Key cannot be removed in a spring return position.

- All models are IP65 and DPDT.
- In place of ⊕, specify Key Retention Code. See table on right.
- Available as assembled units only.
- For accessories, see page 466.
- For dimensions, see page 468.

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

Switch Engraving Order Form – A6 Series

Copy this order form and use it to specify Letter Height, Maximum Number of Lines and Text to be engraved.

To insure engraving accuracy, fax it to your IDEC representative or Distributor.

Your Company: \_\_\_\_\_  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 PO: \_\_\_\_\_

Telephone: \_\_\_\_\_  
 Fax: \_\_\_\_\_  
 Email: \_\_\_\_\_  
 Part Number to be Engraved: \_\_\_\_\_

Please check one of the boxes below to indicate your choice of engraving options:

**Rectangular Switch**

	# of Lines	Letter Height	Max. Characters Per Line
<input type="checkbox"/>	1	5/32	6
<input type="checkbox"/>	2	5/32	6
<input type="checkbox"/>		1/8	6
<input type="checkbox"/>	3	1/8	6
<input type="checkbox"/>	4	N/A	

**Square Switch**

	# of Lines	Letter Height	Max. Characters Per Line
<input type="checkbox"/>	1	5/32	5
<input type="checkbox"/>	2	5/32	5
<input type="checkbox"/>		1/8	6
<input type="checkbox"/>	3	1/8	6
<input type="checkbox"/>	4	N/A	

**Round Switch**

	# of Lines	Letter Height	Max. Characters Per Line
<input type="checkbox"/>	1	5/32	3
<input type="checkbox"/>		1/8	3
<input type="checkbox"/>	2	5/32	Custom*
<input type="checkbox"/>	3	1/8	Custom*
<input type="checkbox"/>	4	3/32	Custom*

\*Engraving is possible, but character size will be smaller than standard sizes.



1. Engraving is done on the button itself for non-Illuminated pushbuttons and on marking plate for illuminated pushbuttons and pilot lights.
2. Please enter text exactly how you want it engraved, take care to emphasize capital or small letters.

Enter text to be engraved:

Line 1: \_\_\_\_\_  
 Line 2: \_\_\_\_\_  
 Line 3: \_\_\_\_\_  
 Line 4: \_\_\_\_\_

**Sample Letter Sizes**

1/8 Letters: **OPEN**








5/32 Letters: **OPEN**

For IDEC Internal Use Only:  
 Work Order #: \_\_\_\_\_

**Accessories**
**Switches & Pilot Lights**
**Display Lights**
**Relays & Sockets**
**Timers**
**Terminal Blocks**
**Circuit Breakers**

Appearance		Description	Used With	Part Number
Locking Ring Wrench		Made of metal. Used for tightening plastic locking ring during installation. Tightening torque should not exceed 3kgf-cm	Ø 5/8" (16mm) units	MT-001
			Ø 31/64" (12mm) AP2M units	MT-002
			Ø 13/32" (10mm) AP1M units	MT-003
Lens Removal Tool		Made of metal. Used for removing lens or button from the housing	All pushbuttons and pilot lights	MT-101
Lamp Holder Tool		Made of rubber. Used for removing and replacing LED lamps in illuminated units	All illuminated pushbuttons and pilot lights	OR-77
Switch Guard		Prevents inadvertent switch operation. IP40 dust-tight. 90 degrees opening maintained	Round/Square	AL-K6
			Rectangular	AL-KH6
			Prevents inadvertent switch operation. IP65 oiltight 180 degrees opening, spring return	Round/Square
			Rectangular	AL-KH6SP
Terminal Cover		Made of translucent nylon. Fits over and shields the terminals	All 5/8" (16mm) units	AL-V6
Dust Cover		Fits over the lens or button to provide extra protection from dust (not applicable for oversize lenses or buttons).	All round units	AL-D6
			All square units	AL-DQ6
			All rectangular units	AL-DH6
Adaptor Socket		Plug-on terminal adaptor with solder terminals		AL-C6
		Plug-on terminal adaptor with PCB terminals	All 5/8" (16mm) units	AL-C6V
Mounting Hole Plug		Fills unused panel cutouts. Made of nitrile rubber. Push-in installation from front of panel. IP65 (oiltight).	Rubber	AL-B6
		Fills unused panel cutouts. Made of aluminum. Screw-on locking ring from inside of panel. IP65 (oiltight).	Aluminum	AL-BM6
		Round Mounting Hole Plug	Plastic (Applicable for flush mount switches only)	LA9Z-BS6
		Square Mounting Hole Plug		LA9Z-BS7
		Rectangular Mounting Hole Plug		LA9Z-BS8
Replacement LED Lamps		LED with built in current limiting resistor (with all illuminated assemblies).	5V DC	LATD-5 ☉
			6V AC/DC	LATD-6 ☉
			12V AC/DC	LATD-1 ☉
			24V AC/DC	LATD-2 ☉
Replacement Locking Ring		Fastens operators to panel (included with all operators).	All switches & pilot lights	HA9Z-LN
Anti-Rotation Ring		Prevents rotation of switches in panel (included with all operators).	All switches & pilot lights	AL6-LP
Replacement Engraving Inserts		Engraving plates to allow legends underneath translucent lenses (included with all lenses).	Round standard	AL6M-W
			Square standard	AL6Q-W
			Rectangular standard	AL6H-W
			Round oversize	AL6M-MW
			Square/rectangular oversize	AL6Q-QW
Replacement Keys		Pair of keys (#132). All key switches use same standard key.	All key selectors	AS6-SK

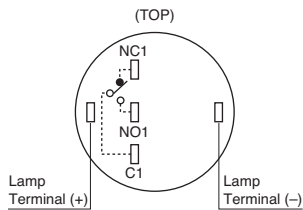
1. In place of ☉ specify color code. A=Amber, G=Green, Y=Yellow, R=Red, S=Blue, W=Warm White, JW=Cool White.  
 2. LEDs include built-in current limiting resistor and reverse polarity protection diode.

Appearance	Description	Used With	Part Number
Flush Bezel	 ø24mm round, metal (aluminum color), panel cut-out ø20.2mm	Pushbuttons, pilot lights, illuminated pushbutton, selector switches, key selector switches and illuminated selector switches.   A6 Switch +  Flush Bezel =  Flush Switch	LA9Z-SM61
	 ø24mm round, plastic (black), square panel cut-out ø20.2mm		LA9Z-S61B
	 24mm square, plastic (black), panel cut-out 20.2 x 20.2mm		LA9Z-S71B
	 24 x 30mm rectangular, plastic (black), rectangular panel cut-out ø20.2 x 26.2mm		LA9Z-S81B
Switch Guard w/ Flush Bezel (spring return)	Rectangular, plastic (black)		LA9Z-KS8

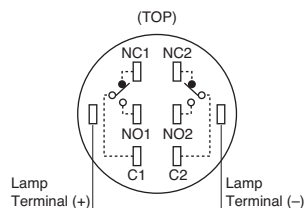
Schematics — A Series: 5/8" (16mm)

Terminal Arrangement (Top View)

Illuminated Pushbuttons

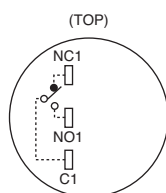


SPDT Contact (Single-pole/Double Throw)

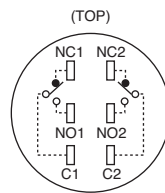


DPDT Contact (Double-pole/Double Throw)

Non-illuminated Pushbuttons and Selector Switches

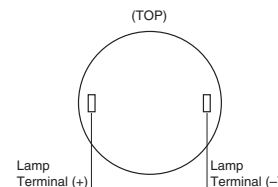


SPDT Contact (Single-pole/Double Throw)

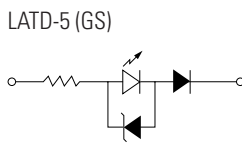
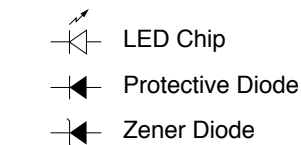
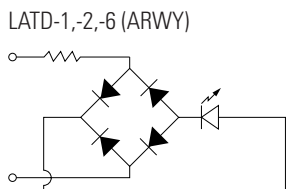
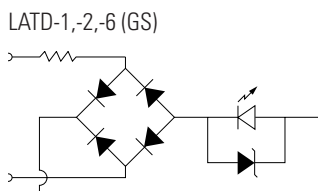


DPDT Contact (Double-pole/Double Throw)

Pilot Lights



IDEC's Superbright LED Internal Circuits



Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

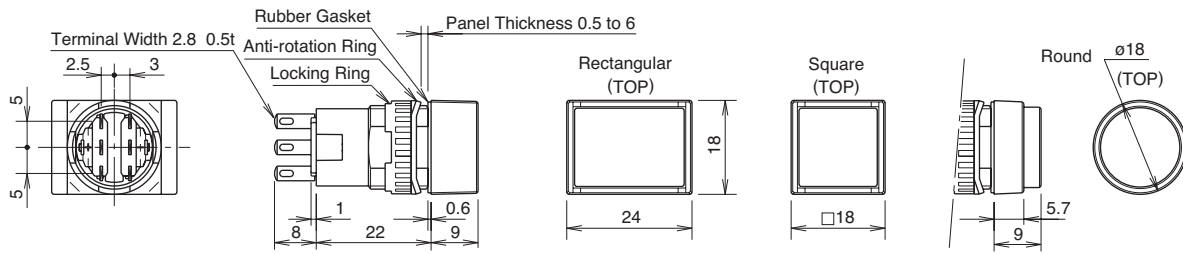
Terminal Blocks

Circuit Breakers

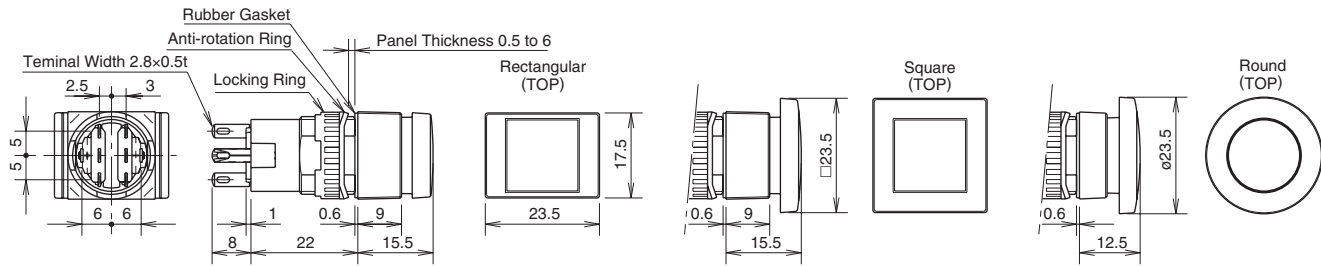


Dimensions (mm)

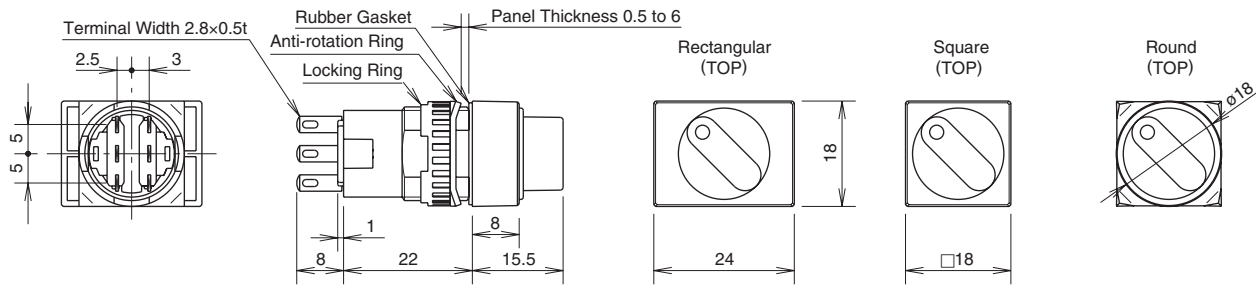
Pushbuttons, Ø 5/8" (16mm)



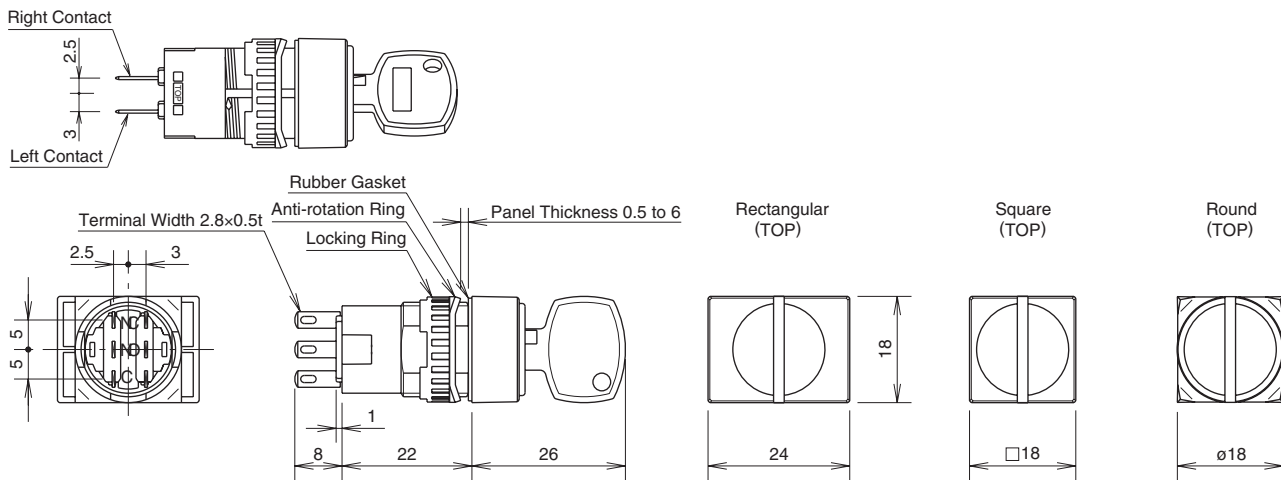
Oversize Lens



Selector Switches, Ø 5/8" (16mm)



Key Selector Switches, Ø 5/8" (16mm)



Switches & Pilot Lights

Display Lights

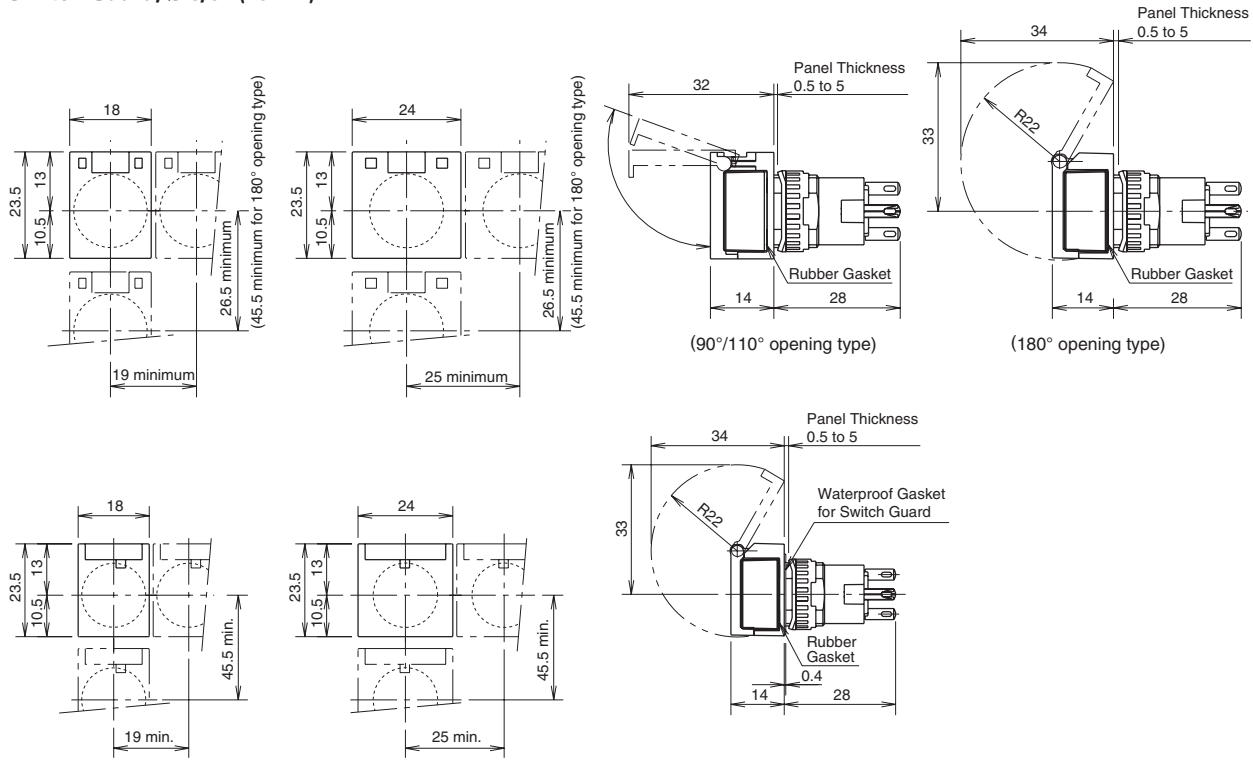
Relays & Sockets

Timers

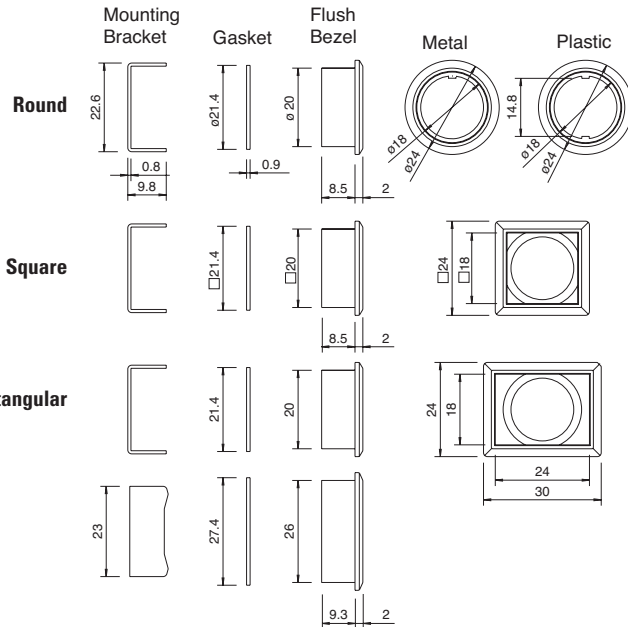
Terminal Blocks

Circuit Breakers

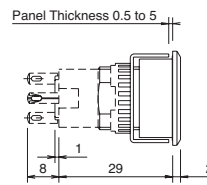
Switch Guard, Ø 5/8" (16mm)



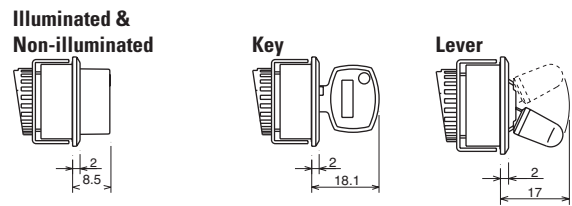
Flush Bezel



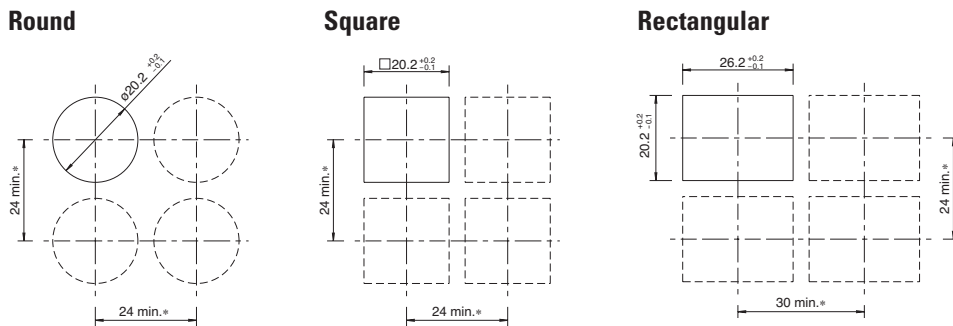
Flush Bezel with Switch



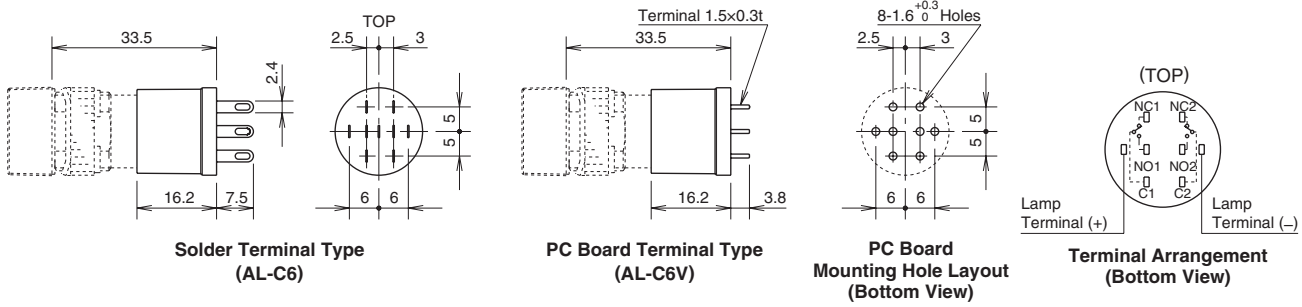
Selector Switches



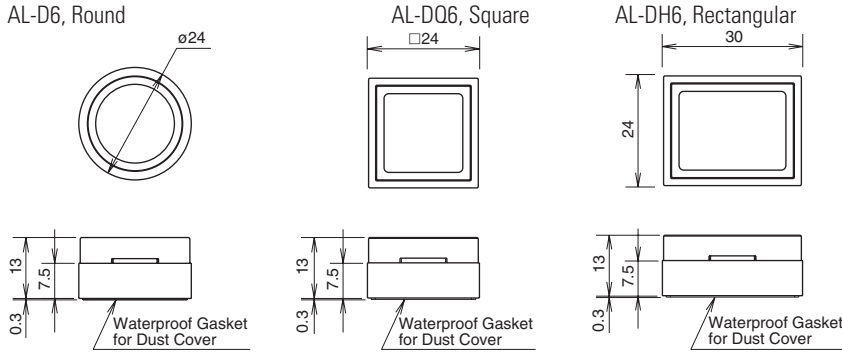
Flush Bezel Mounting Hole Layout



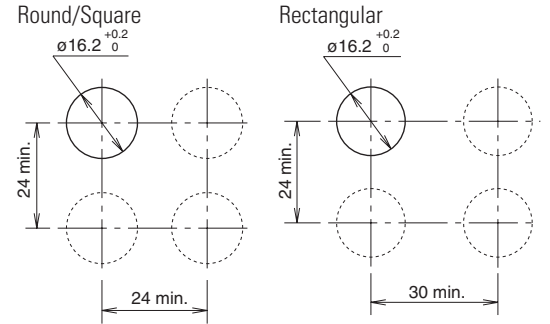
Terminal Sockets



Dust Covers



Panel Cut-Outs For Units w/Dust Cover



Marking Plates

Pushbuttons with Standard Size Lens

Style	Round—AL6M-W	Square—AL6Q-W	Rectangular—AL6H-W
Dimensions			
	$\phi 5/8"$ (16mm)		
Outside (OD)	(13.8mm)	(13.8mm)	(OD <sup>1</sup> x OD <sup>2</sup> ) 13.8 x 19.8mm
Marking Area (a)	(12mm)	(12mm)	(a <sup>1</sup> x a <sup>2</sup> ) 12 x 18mm

Pushbuttons with Oversize Lens

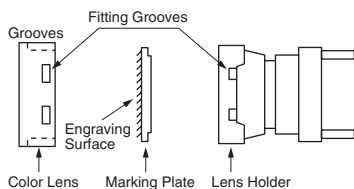
Style	Round—AL6M-MW	Square/Rectangular—AL6Q-QW
Dimensions		
Outside (OD)	$\phi 0.491"$ (12.6mm)	0.491" (12.6mm)
Marking Area (a)	$\phi 0.429"$ (11mm)	0.429" (11mm)

Engraving must be made on the engraving area within 0.02" (0.5mm) deep.

Replacing & and Marking Plate

Removal

Remove the lens holder assembly (lens, marking plate and holder) from the operator by holding the color lens recesses with the lens removal tool (Part No.MT-101) and pulling out. Remove marking plate by pushing the color lens from the rear to disengage the latches. Marking plate must be engraved on the side as shown in the figure on the right.  
 $\phi 5/8"$  (16mm)



Installation

For illuminated pushbuttons:

1. Insert marking plate inside lens in correct direction
2. Press color lens on to lens holder to engage latches.
3. Insert lens holder into housing in correct direction.

Do not loosen spring on illuminated pushbutton units (except on pilot light units). The marking plate must be engraved on the front side as shown above.

## L6 Series – Miniature Switches and Pilot Devices

### Key features of the 5/8" L6 Series include:

- 5/8" (16mm) mounting holes
- Locking lever removable contact blocks
- Solder terminal or PCB terminal options
- Available assembled or as sub-components
- Worldwide approvals
- Incandescent or LED illumination
- Snap action contacts



UL Recognized  
File No. E55996



CSA Certified  
File No. LR21451



Registration No. R9551089 (E-stops)  
Registration No. J9551458 (all other switches)  
Registration No. R95650511 (Pilot Lights)



Contact Ratings	Conforming to Standards	EN60947-1, EN60947-5-1, VDE0660-200, UL508, CSA C22-2 NO.14																																		
	Operating Temperature	Operation: -25 to +55°C (without freezing), 45 to 85% RH Storage: -30 to +80°C (without freezing)																																		
	Vibration Resistance	5 to 55Hz, 1.0 peak-peak amplitude max																																		
	Shock Resistance	Operating limit: 100 m/sec <sup>2</sup> (approximately 10G) Damage limit: 1000 m/sec <sup>2</sup> (approximately 100G)																																		
	Mechanical Life	Momentary pushbuttons 2,000,000 operations minimum All others: 250,000 operations minimum																																		
	Degree of Protection	IP65 (conforming to IEC 60529)																																		
	Dielectric Strength	Switch unit: between live and ground: 2500 volt AC, 1 minute between terminals of different poles: 2500 volt AC, 1 minute between terminals of same pole: 1000 volt AC, 1 minute Illumination unit: between live part and ground: 2500 volt AC, 1 minute																																		
	Insulation Resistance	100MΩ minimum (using 500V DC megger)																																		
	Rated Insulation Voltage	250V AC/DC																																		
	Rated Thermal Current	Gold Contacts (pcb): 3A Silver Contacts (solder): 5A																																		
	Contact Resistance	50Ω maximum initial value																																		
	Rated Operating Current	<b>Silver Contacts</b> (Solder Terminals) <table border="1"> <thead> <tr> <th></th> <th>30V</th> <th>125V</th> <th>250V</th> </tr> </thead> <tbody> <tr> <td>AC resistive</td> <td>—</td> <td>5A</td> <td>2A</td> </tr> <tr> <td>AC inductive</td> <td>—</td> <td>2A</td> <td>1.5A</td> </tr> <tr> <td>DC resistive</td> <td>3A</td> <td>0.4A</td> <td>—</td> </tr> <tr> <td>DC inductive</td> <td>1A</td> <td>0.2A</td> <td>—</td> </tr> </tbody> </table>				30V	125V	250V	AC resistive	—	5A	2A	AC inductive	—	2A	1.5A	DC resistive	3A	0.4A	—	DC inductive	1A	0.2A	—	<b>Gold Clad Contacts</b> (PCB terminals) <table border="1"> <thead> <tr> <th></th> <th>30V</th> <th>125V</th> </tr> </thead> <tbody> <tr> <td>AC inductive</td> <td>-</td> <td>0.1A</td> </tr> <tr> <td>DC resistive</td> <td>0.1A</td> <td>—</td> </tr> </tbody> </table>				30V	125V	AC inductive	-	0.1A	DC resistive	0.1A	—
		30V	125V	250V																																
AC resistive	—	5A	2A																																	
AC inductive	—	2A	1.5A																																	
DC resistive	3A	0.4A	—																																	
DC inductive	1A	0.2A	—																																	
	30V	125V																																		
AC inductive	-	0.1A																																		
DC resistive	0.1A	—																																		
Minimum Recommended Load (reference value for silver contacts)	5V AC/DC, 1mA																																			
Terminal Style	0.110" Solder Tab /PCB																																			
Contact Form	Snap Action, Double Throw																																			
Contact Material	Solder Tab: Pure Silver /PCB: Gold Plated Silver																																			
Electrical Life (at full load)	Momentary pushbuttons: 100,000 operations minimum (1800 operations / hour) All others: 100,000 operations minimum (1200 operations / hour)																																			
Lamp Ratings	Lamp Current Draw	5V DC LED: 8mA 6V AC/DC LED: 7mA 12V AC/DC LED: 8mA 24V AC/DC LED: 8mA 120V AC = 8mA		6V AC/DC incandescent: 100 mA 12V AC/DC incandescent: 50 mA 24V AC/DC incandescent: 25 mA																																
	Lamp Life	Incandescent: 2000 hours./LED 50,000 hours. (on pure DC, half-life intensity)																																		

Switches & Pilot Lights

Display Lights





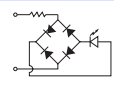
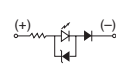

Relays & Sockets

Timers

Terminal Blocks





Circuit Breakers





**Built-in LED Lamp Ratings**

Model	LFTD-5②	LFTD-1②	LFTD-2②	LFTD-H2②
<b>Lamp Base</b>	SX6S/8x5.4			
<b>Rated Voltage</b>	5V DC	12V AC/DC	24V AC/DC	120V AC
<b>Operating Voltage</b>	5V DC ±5%	12V AC/DC ±10%	24V AC/DC ±10%	120V AC ±5%
<b>Current Draw</b>	<b>AC</b>	9mA	9mA	8mA
	<b>DC</b>	8mA	8mA	—
<b>Color Code ②</b>	Specify a color code in place of ② in the Part No: A (amber), G (green), R (red), S (blue), W (white), Y (yellow)			
<b>Lamp Base Color</b>	Same as illumination color			
<b>Voltage Marking</b>	Stamped on the lamp base			
<b>Life (reference value)</b>	Approx. 50,000 hours			
<b>Internal Circuit</b>	A, R, W, Y	A, R, W, Y		 LED Chip  Protection Diode  Zener Diode
				
	G, S	G, S		
				

**Non-Illuminated Pushbuttons (Assembled)**

**Non-Illuminated Pushbuttons**

Style	Operation	Contact	Terminal Style	
			Solder Tab	PCB
 Round	Momentary	SPDT	LA1B-M1C5-①	LA1B-M1C1V-①
		DPDT	LA1B-M1C6-①	LA1B-M1C2V-①
	Maintained	SPDT	LA1B-A1C5-①	LA1B-A1C1V-①
		DPDT	LA1B-A1C6-①	LA1B-A1C2V-①
 Square	Momentary	SPDT	LA2B-M1C5-①	LA2B-M1C1V-①
		DPDT	LA2B-M1C6-①	LA2B-M1C2V-①
	Maintained	SPDT	LA2B-A1C5-①	LA2B-A1C1V-①
		DPDT	LA2B-A1C6-①	LA2B-A1C2V-①
 Rectangular	Momentary	SPDT	LA3B-M1C5-①	LA3B-M1C1V-①
		DPDT	LA3B-M1C6-①	LA3B-M1C2V-①
	Maintained	SPDT	LA3B-A1C5-①	LA3B-A1C1V-①
		DPDT	LA3B-A1C6-①	LA3B-A1C2V-①
 Oversize Round Flush	Momentary	SPDT	HA1B-M1C5-①	HA1B-M1C1V-①
		DPDT	HA1B-M1C6-①	HA1B-M1C2V-①
	Maintained	SPDT	HA1B-A1C5-①	HA1B-A1C1V-①
		DPDT	HA1B-A1C6-①	HA1B-A1C2V-①

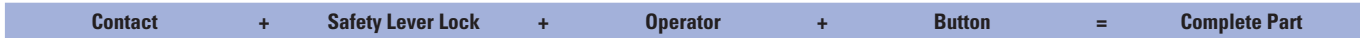
Style	Operation	Contact	Terminal Style	
			Solder Tab	PCB
 Oversize Round Extended	Momentary	SPDT	HA1B-M2C5-①	HA1B-M2C1V-①
		DPDT	HA1B-M2C6-①	HA1B-M2C2V-①
	Maintained	SPDT	HA1B-A2C5-①	HA1B-A2C1V-①
		DPDT	HA1B-A2C6-①	HA1B-A2C2V-①
 Oversize Square Flush	Momentary	SPDT	HA2B-M1C5-①	HA2B-M1C1V-①
		DPDT	HA2B-M1C6-①	HA2B-M1C2V-①
	Maintained	SPDT	HA2B-A1C5-①	HA2B-A1C1V-①
		DPDT	HA2B-A1C6-①	HA2B-A1C2V-①
 Oversize Square Extended	Momentary	SPDT	HA2B-M2C5-①	HA2B-M2C1V-①
		DPDT	HA2B-M2C6-①	HA2B-M2C2V-①
	Maintained	SPDT	HA2B-A2C5-①	HA2B-A2C1V-①
		DPDT	HA2B-A2C6-①	HA2B-A2C2V-①
 Mushroom	Momentary	SPDT	HA1B-M3C5-①	HA1B-M3C1V-①
		DPDT	HA1B-M3C6-①	HA1B-M3C2V-①
	Maintained	SPDT	HA1B-A3C5-①	HA1B-A3C1V-①
		DPDT	HA1B-A3C6-①	HA1B-A3C2V-①

- In place of ① specify Button Color Code from table.
- Illuminated (translucent) style lenses also available, specify as such: instead of LA1B-M1C5-① use LA1B-M1C5L-② in place of ② (specify Lens Color Code from next page.)
- PCB terminal models also available with silver contacts (change "1" or "2" to "5" or "6" respectively, ie LA1B-M1C1V-① becomes LA1B-M1C5V-①).

**① Button Color Codes**

Color	Code	Color	Code
Black	B	Blue	S
Green	G	White	W
Red	R	Yellow	Y









Non-Illuminated Pushbuttons (Sub-Assembled)




Operators

Style	Momentary	Maintained
Round 	LA1L-MO	LA1L-AO
Square 	LA2L-MO	LA2L-AO
Rectangular 	LA3L-MO	LA3L-AO
Oversize Round 	HA1B-MO	HA1B-AO
Oversize Square 	HA2B-MO	HA2B-AO
Mushroom 	HA1B-MOL	HA1B-AOL

Buttons/Lenses

Style	Button	Lens
Round 	AB6M-BK2-①	AL6M-LK2-②
Square 	AB6Q-BK2-①	AL6Q-LK2-②
Rectangular 	AB6H-BK2-①	AL6H-LK2-②
Oversize Round Flush 	HA1A-B1-①	HA1A-L1-②*
Oversize Round Extended 	HA1A-B2-①	-
Oversize Square Flush 	HA2A-B1-①	HA2A-L1-②**
Oversize Square Extended 	HA2A-B2-①	-
Mushroom 	HA1A-B3-①	HA1A-L3-②

Contacts

Appearance	Contacts	Terminal Style	
		Solder Tab	PCB
	Gold SPDT DPDT	HA-C1 HA-C2	HA-C1V HA-C2V
		Silver SPDT DPDT	HA-C5 HA-C6

Safety Lever Lock

Appearance	Part Number
	HA9Z-LS

① Button Color Code

Color	Code
Black	B
Green	G
Red	R
Blue	S
White	W
Yellow	Y

② Lens Color Code

Color	Code
Amber	A
Green	G
Red	R
Blue	S
Yellow	Y
White	W

- 1. In place of ① specify Button Color Code from table on right.
- 2. In place of ② specify Lens Color Code from table on right.
- 3. \*requires HA1L-MO or HA1L-AO operator instead of HA1B-MO or HA1B-AO.
- 4. \*\*requires HA2L-MO or HA2L-AO instead of HA2B-MO or HA2B-AO.

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers



**HA1B/HA1E E-Stop**

**Miniature Switches and Pilot Devices: 5/8" (16mm)**

**Key features of HA1B/HA1E Push Lock Turn Reset include:**

- PCB or Solder Terminals
- Locking Lever Removable Contact Blocks
- Positive Action Contacts
- 1 or 2 form B (SPST-NC) Contacts
- IP65 Protection
- 16mm Mounting Hole
- Tamper Proof Construction



File No. DK95-00138



CSA File No. LR21451



UL Recognized File No. E55996



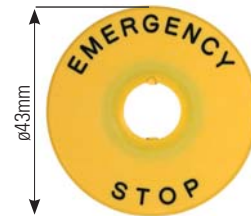
Direct Opening Action

**Specifications**

<b>Contact Form</b>	1 or 2 form B (SPST-NC)	
<b>Termination</b>	PCB or Solder Terminal	
<b>Contact Material</b>	Silver	
<b>Applicable Standards</b>	EN60947-5-1, UL508, CSA 22.2. No. 14	
<b>Rated Insulation Voltage</b>	250V AC/DC	
<b>Degree of Protection</b>	IP65	
<b>Conditional Short-Circuit Current and Short-Circuit Protective Device</b>	50 A (at 250V) 10A 250V Fuse, operation class M according to IEC269-1 and IEC269-2	
<b>Positive Opening Operation</b>	Positive opening travel	3.4mm
	Minimum force required to achieve positive opening operation of all break contacts.	10.3 N (2 form B contacts)
	Maximum travel including travel beyond the minimum travel position	5.5mm
	Maximum frequency of actuation	1,200 operations/hour
<b>Pollution Degree</b>	3	


**Nameplates**

**HAAV–Yellow Plastic**




	<b>Part Number</b>
Blank	HAAV-0
Engraved Emergency Stop	HAAV-27

**Positive Action E-Stop**

<b>Appearance</b>	<b>Operation</b>	<b>Contact</b>		<b>Terminal Style</b>	
				<b>Solder Tab</b>	<b>PCB</b>
E-Stop 	Pushlock/ Turn Reset	DPST(NC) (2 form B)		HA1B-V2E2R	HA1B-V2E2VR
		Short Body	SPST-NC (1 form B) DPST-NC (2 form B)	HA1E-V2S1R HA1E-V2S2R	—

1. Button is non-removable, available in red and as complete assembled unit only.
2. E-Stop does not come with safety lever lock.

**Buzzers (IP40)**

<b>Appearance</b>	<b>Operating Voltage</b>	<b>Terminal Style</b>	
		<b>Solder/Tab</b>	<b>PCB</b>
Buzzer-Rectangular 	6V AC/DC ± 10%	LA3Z-1X2	LA3Z-1X2V
	12V to 24 AC/DC ± 10%	LA3Z-1X4	LA3Z-1X4V

**Buzzer Ratings**

Frequency	2 khz ± 500 HZ
Amplitude	80db @ 0.1m (at rated voltage)
Operating Voltage	6V AC/DC or 12 - 24V AC/DC ± 10%
Adjustable Cycle	55 to 600 cycles per minute
Current Draw	DC: 7mA AC: 20mA
Life	1000 hrs. minimum
Insulation Voltage	60V AC/DC
Operating Temperature	-20 to 55°C (no freezing), 45 to 85% RH
Degree of Protection	IP40

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

Pilot Lights (Assembled)

Pilot Lights

Style	Terminal Style	
	Solder Tab	PCB
Round 	LA1P-1C0③-②	LA1P-1C0③V-②
Square 	LA2P-1C0③-②	LA2P-1C0③V-②
Rectangular 	LA3P-1C0③-②	LA3P-1C0③V-②
Oversize Round 	HA1P-1C0③-②	HA1P-1C0③V-②
Oversize Square 	HA2P-1C0③-②	HA2P-1C0③V-②
Oversize Round Unibody 	HA1P-1③-②	—
Oversize Square Unibody 	HA2P-1③-②	—

② Lens/LED Color Codes

Color	Code
Amber	A
Green	G
Red	R
Blue	S
White	W
Yellow	Y

③ Voltage/Lamp Code

Voltage	Code
5V DC LED	1
6V AC/DC LED	2
12V AC/DC LED	3
24V AC/DC LED	4
120V AC LED	8
6V AC/DC Incandescent	5
12V AC/DC Incandescent	6
24V AC/DC Incandescent	7



1. In place of ② specify Lens/LED Color Code from table.
2. In place of ③ specify Voltage Code from table.
3. Lamps also available in 5VDC, 6V AC/DC, 12V AC/DC or 120V AC, change "4" or "7" using Voltage/Lamp Codes (ie LA1P-1C03-② uses 12V AC/DC LED).
4. Light independent of switch position.



**Pilot Lights (Sub-Assembled)**

Terminals + Safety Lever Lock + Lamp Holder + Lamp + Operator + Lens = Completed Unit



**Operators**

Style	Part Number
Round	LA1P-0
Square	LA2P-0
Rectangular	LA3P-0
Oversize Round	HA1P-0
Oversize Square	HA2P-0
Oversize Round Unibody	HA1P-00
Oversize Square Unibody	HA2P-00

**Lenses**

Style	Part Number
Round	AL6M-LK3-Ⓞ
Square	AL6Q-LK3-Ⓞ
Rectangular	AL6H-LK3-Ⓞ
Oversize Round	HA1A-P1-Ⓞ
Oversize Square	HA2A-P1-Ⓞ

In place of Ⓞ specify lens color code.

**Lamps**

Style	Voltage	Part Number
LED	5V DC	LFTD-5Ⓞ
	6V AC/DC	LFTD-6Ⓞ
	12V AC/DC	LFTD-1Ⓞ
	24V AC/DC	LFTD-2Ⓞ
	120 V AC	LFTD-H2Ⓞ
Incandescent	6V AC/DC	LH-06
	12V AC/DC	LH-14
	24V AC/DC	LH-28

In place of Ⓞ specify LED color code from table below.

**Terminals**

Appearance	Solder Tab	PCB
	HA-C00	HA-C00V

Not required for unibody operators.

**Lamp Holder**

Appearance	Part Number
	HA9Z-AH

**Safety Lever Lock**

Appearance	Part Number
	HA9Z-LS

**Ⓞ Lens/LED Color Codes**

Color	Code
Amber	A
Green	G
Red	R
Blue	S
Yellow	Y
White	W

Switches & Pilot Lights

Display Lights

Relays & Sockets







Timers

Terminal Blocks

Circuit Breakers

## Illuminated Pushbuttons (Assembled)

## Illuminated Pushbuttons

Style	Operation	Contact	Terminal Style	
			Solder Tab	PCB
Round 	Momentary	SPDT DPDT	LA1L-M1C5③-② LA1L-M1C6③-②	LA1L-M1C1③V-② LA1L-M1C2③V-②
	Maintained	SPDT DPDT	LA1L-A1C5③-② LA1L-A1C6③-②	LA1L-A1C1③V-② LA1L-A1C2③V-②
Square 	Momentary	SPDT DPDT	LA2L-M1C5③-② LA2L-M1C6③-②	LA2L-M1C1③V-② LA2L-M1C2③V-②
	Maintained	SPDT DPDT	LA2L-A1C5③-② LA2L-A1C6③-②	LA2L-A1C1③V-② LA2L-A1C2③V-②
Rectangular 	Momentary	SPDT DPDT	LA3L-M1C5③-② LA3L-M1C6③-②	LA3L-M1C1③V-② LA3L-M1C2③V-②
	Maintained	SPDT DPDT	LA3L-A1C5③-② LA3L-A1C6③-②	LA3L-A1C1③V-② LA3L-A1C2③V-②
Oversize Round 	Momentary	SPDT DPDT	HA1L-M1C5③-② HA1L-M1C6③-②	HA1L-M1C1③V-② HA1L-M1C2③V-②
	Maintained	SPDT DPDT	HA1L-A1C5③-② HA1L-A1C6③-②	HA1L-A1C1③V-② HA1L-A1C2③V-②
Oversize Square 	Momentary	SPDT DPDT	HA2L-M1C5③-② HA2L-M1C6③-②	HA2L-M1C1③V-② HA2L-M1C2③V-②
	Maintained	SPDT DPDT	HA2L-A1C5③-② HA2L-A1C6③-②	HA2L-A1C1③V-② HA2L-A1C2③V-②
Mushroom 	Momentary	SPDT DPDT	HA1L-M3C5③-② HA1L-M3C6③-②	HA1L-M3C1③V-② HA1L-M3C2③V-②
	Maintained	SPDT DPDT	HA1L-A3C5③-② HA1L-A3C6③-②	HA1L-A3C1③V-② HA1L-A3C2③V-②

## ② Lens Color Codes

Color	Code
Amber	A
Green	G
Red	R
Blue	S
Yellow	Y
White	W

## ③ Voltage/Lamp Code

Voltage	Code
5V DC LED	1
6V AC/DC LED	2
12V AC/DC LED	3
24V AC/DC LED	4
120 V AC LED	8
6V AC/DC Incandescent	5
12V AC/DC Incandescent	6
24V AC/DC Incandescent	7



- In place of ② specify Lens Color Code from table.
- In place of ③ specify Voltage Code from table.
- Lamps also available in 5V DC, 6V AC/DC, 12V AC/DC or 120V AC, change "4" or "7" using voltage/lamp codes (ie LA1P-1C03-② uses 12V AC/DC LED).
- PCB terminal models also available with silver contacts change "1" or "2" to "5" or "6" respectively, (ie LA1L-M1C14V-② becomes LA1L-M1C54V-②).
- Light independent of switch position.

**Illuminated Pushbuttons (Sub-Assembled)**

Terminals + Safety Lever Lock + Lamp Holder + Lamp + Operator + Lens = Completed Unit



Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

**Operators**

Style	Momentary	Maintained
Round	LA1L-MO	LA1L-AO
Square	LA2L-MO	LA2L-AO
Rectangular	LA3L-MO	LA3L-AO
Oversize Round	HA1L-MO	HA1L-AO
Oversize Square	HA2L-MO	HA2L-AO
Mushroom	HA1B-MOL	HA1B-AOL

**Lenses**

Style	Part Number
Round	AL6M-LK2-Ⓢ
Square	AL6Q-LK2-Ⓢ
Rectangular	AL6H-LK2-Ⓢ
Oversize Round	HA1A-L1-Ⓢ
Oversize Square	HA2A-L1-Ⓢ
Mushroom	HA1A-L3-Ⓢ

**Lamps**

Style	Voltage	Part Number
LED	5V DC	LFTD-5Ⓢ
	6V AC/DC	LFTD-6Ⓢ
	12V AC/DC	LFTD-1Ⓢ
	24V AC/DC	LFTD-2Ⓢ
	120 V AC	LFTD-H2Ⓢ
Incandescent	6V AC/DC	LH-06
	12V AC/DC	LH-14
	24V AC/DC	LH-28

**Contacts**

Appearance	Contacts	Terminal Style	
		Solder Tab	PCB
	SPDT DPDT	HA-C10 HA-C20	HA-C10V HA-C20V
			SPDT DPDT

**Lamp Holder**

Appearance	Part Number
	HA9Z-AH

**Safety Lever Lock**

Appearance	Part Number
	HA9Z-LS

Ⓢ Lens/LED Color Codes

Color	Code
Amber	A
Green	G
Red	R
Blue	S
Yellow	Y
White	W

In place of Ⓢ specify lens color code.

Selector Switches (Assembled)

Selector Switches

Style	Position	Position Diagram	Contact	Terminal Style	
				Solder Tab	PCB
<p>Round</p>	90° 2-Position	Maintained		LA1S-2C6	LA1S-2C2V
		Spring return from right		LA1S-21C6	LA1S-21C2V
	45° 3-Position	Maintained		LA1S-3C6	LA1S-3C2V
		Spring return from right		LA1S-31C6	LA1S-31C2V
		Spring return from left		LA1S-32C6	LA1S-32C2V
		2-Way spring return		LA1S-33C6	LA1S-33C2V
<p>Square</p>	90° 2-Position	Maintained		LA2S-2C6	LA2S-2C2V
		Spring return from right		LA2S-21C6	LA2S-21C2V
	45° 3-Position	Maintained		LA2S-3C6	LA2S-3C2V
		Spring return from right		LA2S-31C6	LA2S-31C2V
		Spring return from left		LA2S-32C6	LA2S-32C2V
		2-Way spring return		LA2S-33C6	LA2S-33C2V
<p>Rectangular</p>	90° 2-Position	Maintained		LA3S-2C6	LA3S-2C2V
		Spring return from right		LA3S-21C6	LA3S-21C2V
	45° 3-Position	Maintained		LA3S-3C6	LA3S-3C2V
		Spring return from right		LA3S-31C6	LA3S-31C2V
		Spring return from left		LA3S-32C6	LA3S-32C2V
		2-Way spring return		LA3S-33C6	LA3S-33C2V
<p>Oversize Round</p>	90° 2-Position	Maintained		HA1S-2C6	HA1S-2C2V
		Spring return from right		HA1S-21C6	HA1S-21C2V
	45° 3-Position	Maintained		HA1S-3C6	HA1S-3C2V
		Spring return from right		HA1S-31C6	HA1S-31C2V
		Spring return from left		HA1S-32C6	HA1S-32C2V
		2-Way spring return		HA1S-33C6	HA1S-33C2V

Contact Operations

(for all selectors)

Contacts	Operator Position and Contact Operation						
2-pos. (DPDT)	Left <table border="0"> <tr> <td>Left Contact</td> <td>Right Contact</td> </tr> <tr> <td>NO NC</td> <td>NO NC</td> </tr> <tr> <td></td> <td></td> </tr> </table>	Left Contact	Right Contact	NO NC	NO NC		
	Left Contact	Right Contact					
NO NC	NO NC						
Right <table border="0"> <tr> <td>Left Contact</td> <td>Right Contact</td> </tr> <tr> <td>NO NC</td> <td>NO NC</td> </tr> <tr> <td></td> <td></td> </tr> </table>	Left Contact	Right Contact	NO NC	NO NC			
Left Contact	Right Contact						
NO NC	NO NC						
3-pos. (DPDT)	Left <table border="0"> <tr> <td>Left Contact</td> <td>Right Contact</td> </tr> <tr> <td>NO NC</td> <td>NO NC</td> </tr> <tr> <td></td> <td></td> </tr> </table>	Left Contact	Right Contact	NO NC	NO NC		
	Left Contact	Right Contact					
	NO NC	NO NC					
Center <table border="0"> <tr> <td>Left Contact</td> <td>Right Contact</td> </tr> <tr> <td>NO NC</td> <td>NO NC</td> </tr> <tr> <td></td> <td></td> </tr> </table>	Left Contact	Right Contact	NO NC	NO NC			
Left Contact	Right Contact						
NO NC	NO NC						
Right <table border="0"> <tr> <td>Left Contact</td> <td>Right Contact</td> </tr> <tr> <td>NO NC</td> <td>NO NC</td> </tr> <tr> <td></td> <td></td> </tr> </table>	Left Contact	Right Contact	NO NC	NO NC			
Left Contact	Right Contact						
NO NC	NO NC						

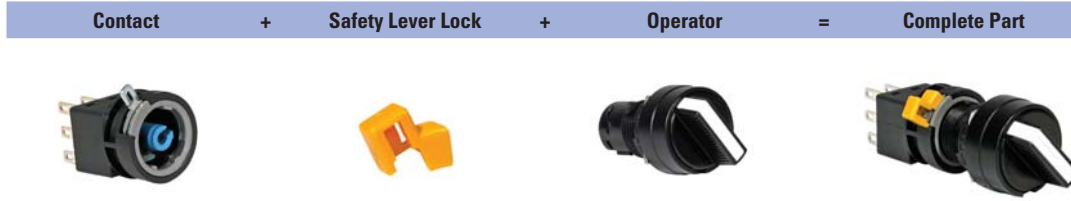


As viewed from front of switch.



- All assembled selector switches use DPDT contacts.
- For SPDT contacts see sub-components on next page.
- PCB terminal models also available with silver contacts change "1" or "2" to "5" or "6" respectively, (ie LA1S-21C2V becomes LA1S-21C6V).



**Selector Switches (Sub-Assembled)**




**Operators**

Style	Position	Function	Part Number
Round 	2	Maintained Spring from right	LA1S-2Y LA1S-21Y
	3	Maintained Spring from right Spring from left Spring from both	LA1S-3Y LA1S-31Y LA1S-32Y LA1S-33Y
Square 	2	Maintained Spring from right	LA2S-2Y LA2S-21Y
	3	Maintained Spring from right Spring from left Spring from both	LA2S-3Y LA2S-31Y LA2S-32Y LA2S-33Y
Rectangular 	2	Maintained Spring from right	LA3S-2Y LA3S-21Y
	3	Maintained Spring from right Spring from left Spring from both	LA3S-3Y LA3S-31Y LA3S-32Y LA3S-33Y
Oversize Round 	2	Maintained Spring from right	HA1S-2Y HA1S-21Y
	3	Maintained Spring from right Spring from left Spring from both	HA1S-3Y HA1S-31Y HA1S-32Y HA1S-33Y

**Contacts**

Appearance	Contacts	Terminal Style	
		Solder Tab	PCB
	Gold SPDT DPDT	HA-C1	HA-C1V
		HA-C2	HA-C2V
	Silver SPDT DPDT	HA-C5	HA-C5V
		HA-C6	HA-C6V

-  1. All assembled switches listed on previous page use DPDT contacts.
- 2. SPDT Contacts for use on 2 position selector switch only

**Safety Lever Lock**

Appearance	Part Number
	HA9Z-LS



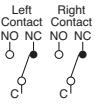
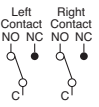
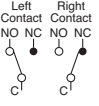
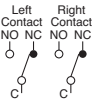
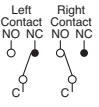
Key Switches (Assembled)


Key Switches

Style	Position	Position Diagram	Contact	Terminal Style	
				Solder Tab	PCB
Round 	90° 2-Position	Maintained		DPDT	LA1K-2C6③ LA1K-2C2V③
		Spring return from right		DPDT	LA1K-21C6B LA1K-21C2VB
	45° 3-Position	Maintained		DPDT	LA1K-3C6③ LA1K-3C2V③
		Spring return from right		DPDT	LA1K-31C6③ LA1K-31C2V③
		Spring return from left		DPDT	LA1K-32C6③ LA1K-32C2V③
		2-Way spring return		DPDT	LA1K-33C6D LA1K-33C2VD
Square 	90° 2-Position	Maintained		DPDT	LA2K-2C6③ LA2K-2C2V③
		Spring return from right		DPDT	LA2K-21C6B LA2K-21C2VB
	45° 3-Position	Maintained		DPDT	LA2K-3C6③ LA2K-3C2V③
		Spring return from right		DPDT	LA2K-31C6③ LA2K-31C2V③
		Spring return from left		DPDT	LA2K-32C6③ LA2K-32C2V③
		2-Way spring return		DPDT	LA2K-33C6D LA2K-33C2VD
Rectangular 	90° 2-Position	Maintained		DPDT	LA3K-2C6③ LA3K-2C2V③
		Spring return from right		DPDT	LA3K-21C6B LA3K-21C2VB
	45° 3-Position	Maintained		DPDT	LA3K-3C6③ LA3K-3C2V③
		Spring return from right		DPDT	LA3K-31C6③ LA3K-31C2V③
		Spring return from left		DPDT	LA3K-32C6③ LA3K-32C2V③
		2-Way spring return		DPDT	LA3K-33C6D LA3K-33C2VD
Oversize Round 	90° 2-Position	Maintained		DPDT	HA1K-2C6③ HA1K-2C2V③
		Spring return from right		DPDT	HA1K-21C6B HA1K-21C2VB
	45° 3-Position	Maintained		DPDT	HA1K-3C6③ HA1K-3C2V③
		Spring return from right		DPDT	HA1K-31C6③ HA1K-31C2V③
		Spring return from left		DPDT	HA1K-32C6③ HA1K-32C2V③
		2-Way spring return		DPDT	HA1K-33C6D HA1K-33C2VD

Contact Operations


(for all selectors)


Contacts	Operator Position and Contact Operation
2-pos. (DPDT)	Left 
	Right 
3-pos. (DPDT)	Left 
	Center 
	Right 

 As viewed from front of switch.

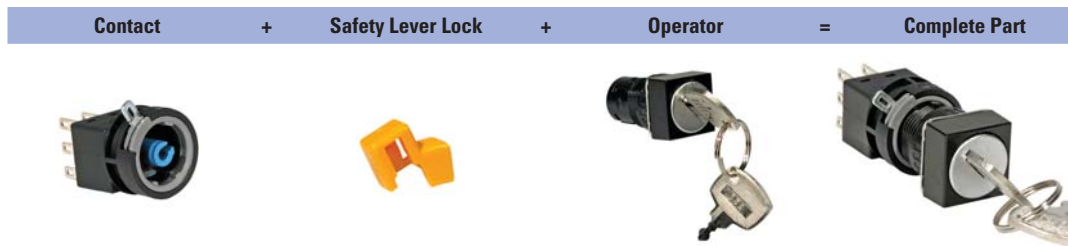
③ Key Retention Option Codes

Code	Description
A	Key not retained in any position (removable in all positions)
B	Key retained in right position only
C	Key retained in left position only
D	Key retained in left and right (3 position only)
E	Key retained in center only (3 position only)
G	Key retained right and center (3 position only)
H	Key retained left and center (3 position only)





 Key cannot be removed from a spring-return position.

-  1. In place of ③ specify Key Retention Code from next page.
- 2. All assembled key switches have DPDT contacts. For SPDT see sub-assembled on next page.
- 3. PCB terminal models also available with silver contacts change "1" or "2" to "5" or "6" respectively, (ie LA1K-2C2V③ becomes LA1K-2C6V③).


**Selector Switches (Sub-Assembled)**




**Operators**


Style	Position	Function	Part Number
Round 	2	Maintained Spring from right	LA1K-2Ⓞ LA1K-21B
	3	Maintained Spring from right Spring from left Spring from both	LA1K-3Ⓞ LA1K-31Ⓞ LA1K-32Ⓞ LA1K-33D
Square 	2	Maintained Spring from right	LA2K-2Ⓞ LA2K-21B
	3	Maintained Spring from right Spring from left Spring from both	LA2K-3Ⓞ LA2K-31Ⓞ LA2K-32Ⓞ LA2K-33D
Rectangular 	2	Maintained Spring from right	LA3K-2Ⓞ LA3K-21B
	3	Maintained Spring from right Spring from left Spring from both	LA3K-3Ⓞ LA3K-31Ⓞ LA3K-32Ⓞ LA3K-33D
Oversize Round 	2	Maintained Spring from right	HA1K-2Ⓞ HA1K-21B
	3	Maintained Spring from right Spring from left Spring from both	HA1K-3Ⓞ HA1K-31Ⓞ HA1K-32Ⓞ HA1K-33D

**Contacts**

Appearance	Contacts	Terminal Style	
		Solder Tab	PCB
 Gold	SPDT DPDT	HA-C1 HA-C2	HA-C1V HA-C2V
	SPDT DPDT	HA-C5 HA-C6	HA-C5V HA-C6V


-  1. All assembled switches listed on previous page use DPDT contacts.
- 2. SPDT Contacts for use on 2 position selector switch only


**Safety Lever Lock**

Appearance	Part Number
	HA9Z-LS

**Ⓞ Key Retention Option Codes**

Code	Description
A	Key not retained in any position (removable in all positions)
B	Key retained in right position only
C	Key retained in left position only
D	Key retained in left and right (3 position only)
E	Key retained in center only (3 position only)
G	Key retained right and center (3 position only)
H	Key retained left and center (3 position only)

 Key cannot be removed from a spring-return position.

-  1. In place of Ⓞ specify key removable code from table on right.
- 2. Operator includes two keys.

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

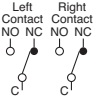
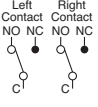
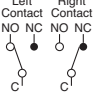
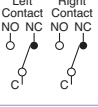
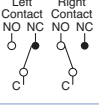
Illuminated Selector Switches (Assembled)

Illuminated Selector Switches

Style	Position	Contact	Terminal Style		
			Solder Tab	PCB	
Round 	90° 2-Position	Maintained 	DPDT	LA1F-2C6③-②	LA1F-2C2③V-②
		Spring return from right 	DPDT	LA1F-21C6③-②	LA1F-21C2③V-②
	45° 3-Position	Maintained 	DPDT	LA1F-3C6③-②	LA1F-3C2③V-②
		Spring return from right 	DPDT	LA1F-31C6③-②	LA1F-31C2③V-②
		Spring return from left 	DPDT	LA1F-32C6③-②	LA1F-32C2③V-②
		2-Way spring return 	DPDT	LA1F-33C6③-②	LA1F-33C2③V-②
Square 	90° 2-Position	Maintained 	DPDT	LA2F-2C6③-②	LA2F-2C2③V-②
		Spring return from right 	DPDT	LA2F-21C6③-②	LA2F-21C2③V-②
	45° 3-Position	Maintained 	DPDT	LA2F-3C6③-②	LA2F-3C2③V-②
		Spring return from right 	DPDT	LA2F-31C6③-②	LA2F-31C2③V-②
		Spring return from left 	DPDT	LA2F-32C6③-②	LA2F-32C2③V-②
		2-Way spring return 	DPDT	LA2F-33C6③-②	LA2F-33C2③V-②
Rectangular 	90° 2-Position	Maintained 	DPDT	LA3F-2C6③-②	LA3F-2C2③V-②
		Spring return from right 	DPDT	LA3F-21C6③-②	LA3F-21C2③V-②
	45° 3-Position	Maintained 	DPDT	LA3F-3C6③-②	LA3F-3C2③V-②
		Spring return from right 	DPDT	LA3F-31C6③-②	LA3F-31C2③V-②
		Spring return from left 	DPDT	LA3F-32C6③-②	LA3F-32C2③V-②
		2-Way spring return 	DPDT	LA3F-33C6③-②	LA3F-33C2③V-②
Oversize Round 	90° 2-Position	Maintained 	DPDT	HA1F-2C6③-②	HA1F-2C2③V-②
		Spring return from right 	DPDT	HA1F-21C6③-②	HA1F-21C2③V-②
	45° 3-Position	Maintained 	DPDT	HA1F-3C6③-②	HA1F-3C2③V-②
		Spring return from right 	DPDT	HA1F-31C6③-②	HA1F-31C2③V-②
		Spring return from left 	DPDT	HA1F-32C6③-②	HA1F-32C2③V-②
		2-Way spring return 	DPDT	HA1F-33C6③-②	HA1F-33C2③V-②

Contact Operations

(for all selectors)

Contacts	Operator Position and Contact Operation	
2-pos. (DPDT)	Left	
	Right	
3-pos. (DPDT)	Left	
	Center	
	Right	


 As viewed from front of switch.

② Lens/LED Color Codes

Color	Code	Color	Code
Amber	A	Blue	S
Green	G	Yellow	Y
Red	R	White	W

③ Voltage/Lamp Code

Voltage	Code
5V DC LED	1
6V AC/DC LED	2
12V AC/DC LED	3
24V AC/DC LED	4
120V AC LED	8
6V AC/DC Incandescent	5
12V AC/DC Incandescent	6
24V AC/DC Incandescent	7

-  In place of ② specify Lens/LED Color Code from table above.
- In place of ③ specify Voltage Code from table above.
- Lamps also available in 5V DC, 6V AC/DC, 12 V AC/DC or 120V AC, change "4" or "7" using voltage/lamp codes (ie LA1F-2C6③-② uses 12V AC/DC LED).
- All switches listed have DPDT contacts. For SPDT see sub-assembled on next page.
- PCB terminal models also available with silver contacts change "1" or "2" to "5" or "6" respectively, (ie LA1F-2C24V-② becomes LA1F-2C64V-②).
- Light independent of switch position.



**Illuminated Selector Switches (Sub-Assembled)**



**Operators**

Style	Position	Function	Part Number
Round	2	Maintained Spring from right	LA1F-20 LA1F-210
	3	Maintained Spring from right	LA1F-30 LA1F-310
		Maintained Spring from left Spring from both	LA1F-320 LA1F-330
Square	2	Maintained Spring from right	LA2F-20 LA2F-210
	3	Maintained Spring from right	LA2F-30 LA2F-310
		Maintained Spring from left Spring from both	LA2F-320 LA2F-330
Rectangular	2	Maintained Spring from right	LA3F-20 LA3F-210
	3	Maintained Spring from right	LA3F-30 LA3F-310
		Maintained Spring from left Spring from both	LA3F-320 LA3F-330
Oversize Round	2	Maintained Spring from right	HA1F-20 HA1F-210
	3	Maintained Spring from right	HA1F-30 HA1F-310
		Maintained Spring from left	HA1F-320
		Maintained Spring from both	HA1F-330

**Safety Lever Lock**

Appearance	Part Number
	HA9Z-LS

**Lamp Holder**

Appearance	Part Number
	HA9Z-AH

**Lamps**

Style	Voltage	Part Number
LED	5V DC	LFTD-5Ⓞ
	6V AC/DC	LFTD-6Ⓞ
	12V AC/DC	LFTD-1Ⓞ
	24V AC/DC	LFTD-2Ⓞ
	120V AC	LFTD-H2Ⓞ
Incandescent	6V AC/DC	LH-06
	12V AC/DC	LH-14
	24V AC/DC	LH-28

In place of Ⓞ specify LED color code from table below.

**Contacts**

Appearance	Contacts	Terminal Style	
		Solder Tab	PCB
	SPDT DPDT	HA-C10	HA-C10V
		HA-C20	HA-C20V
	SPDT DPDT	HA-C50	HA-C50V
		HA-C60	HA-C60V

All assembled selectors on previous pages use DPDT contacts. SPDT contacts are for use only on two position selectors.

**Lenses/Handles**

Appearance	Part Number
Standard 	LA1A-F-Ⓞ
Oversize 	HA1A-F-Ⓞ

In place of Ⓞ specify lens color code from table.

**Ⓞ Lens/LED Color Codes**

Color	Code
Amber	A
Green	G
Red	R
Blue	S
Yellow	Y
White	W

Switches & Pilot Lights

Display Lights

Relays & Sockets


Timers

Terminal Blocks

Circuit Breakers

Pushbutton Selectors (Assembled)

Pushbutton Selectors










Style	Terminal Style	
	Solder Tab	PCB
	2 Position	HA1R-2C6-Ⓞ HA1R-2C2V-Ⓞ
	3 Position	HA1R-3C6-Ⓞ HA1R-3C2V-Ⓞ

- 1. In place of Ⓞ specify Button Color Code.
- 2. PCB terminal models also available with silver contacts (change "1" or "2" to "5" or "6" respectively, ie HA1R-2C2V-Ⓞ becomes HA1R-2C6V-Ⓞ).
- 3. Pushed position, momentary only.






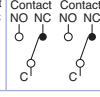

① Button Color Codes

Color	Code	Color	Code
Amber	A	Blue	S
Green	G	Yellow	Y
Red	R	White	W

Contact Operation










Style	Operator Position					
	Left		Center		Right	
	Normal	Pushed	Normal	Pushed	Normal	Pushed
2 Position			—	—		
3 Position				Blocked		

Contact Operation

Contacts	Operator Position and Contact Information	Operator Position and Contact Information		
		Down	Center	Up
2-pos. (DPDT)	Maintained Spring from Top			
2-pos. (DPDT)	Spring Return from Bottom			
3-pos. (DPDT)	All models			

 As viewed from front of switch.

Lever Switches

Style	Operation	Contacts	Terminal Type	
			Solder Tab	PCB
	Maintained 	DPDT	LA1T-2C6	LA1T-2C2V
	Spring return from top 	DPDT	LA1T-21C6	LA1T-21C2V
	Spring return from bottom 	DPDT	LA1T-22C6	LA1T-22C2V
	Maintained 	DPDT	LA1T-3C6	LA1T-3C2V
	Spring return from top 	DPDT	LA1T-31C6	LA1T-31C2V
	Spring return from bottom 	DPDT	LA1T-32C6	LA1T-32C2V
	Spring return from both 	DPDT	LA1T-33C6	LA1T-33C2V

- 1. PCB terminal models also available with silver contacts (change "1" or "2" to "5" or "6" respectively, ie LA1T-2C2V becomes LA1T-2C6V).
- 2. Terminology: U = up, D = down, C = center.

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

**Switch Engraving Order Form – L6 Series**

Copy this order form and use it to specify Letter Height, Maximum Number of Lines and Text to be engraved.

To insure engraving accuracy, fax it to your IDEC representative or Distributor.

Your Company: \_\_\_\_\_  
 Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 PO: \_\_\_\_\_

Telephone: \_\_\_\_\_  
 Fax: \_\_\_\_\_  
 Email: \_\_\_\_\_  
 Part Number to be Engraved: \_\_\_\_\_

Please check one of the boxes below to indicate your choice of engraving options:



	# of Lines	Letter Height	Max. Characters Per Line
<input type="checkbox"/>	1	5/32	6
<input type="checkbox"/>	2	5/32	6
<input type="checkbox"/>		1/8	6
<input type="checkbox"/>	3	1/8	6
<input type="checkbox"/>	4	N/A	

	# of Lines	Letter Height	Max. Characters Per Line
<input type="checkbox"/>	1	5/32	5
<input type="checkbox"/>	2	5/32	5
<input type="checkbox"/>		1/8	6
<input type="checkbox"/>	3	1/8	6
<input type="checkbox"/>	4	N/A	

	# of Lines	Letter Height	Max. Characters Per Line
<input type="checkbox"/>	1	5/32	3
<input type="checkbox"/>		1/8	3
<input type="checkbox"/>	2	Custom*	
<input type="checkbox"/>	3	Custom*	
<input type="checkbox"/>	4	N/A	

\*Engraving is possible, but character size will be smaller than standard sizes.



- Above mentioned specifications hold true for standard size pushbuttons (round, square and rectangular).
- Oversize pushbuttons and pilot lights allow you to engrave 1 additional character.
- Engraving is done on the button itself for non-illuminated push buttons and on marking plate for illuminated pushbuttons and pilot lights.
- Please enter text exactly how you want it engraved, take care to emphasize capital or small letters.

Enter text to be engraved:

Line 1: \_\_\_\_\_  
 Line 2: \_\_\_\_\_  
 Line 3: \_\_\_\_\_  
 Line 4: \_\_\_\_\_

**Sample Letter Sizes**

1/8 Letters: **OPEN**

5/32 Letters: **OPEN**

For IDEC Internal Use Only:

Work Order #: \_\_\_\_\_

## Accessories

Part		Specifications	Part Number	Notes		
Ring Wrench		Made of metal	MT-001	Used for tightening the plastic locking ring when installing the L6 series unit on a panel. Tightening torque should not exceed 9kgf cm when tightening the locking ring.		
Lamp Holder Tool (Made of Rubber)		Made of rubber. Used for removing and replacing LED and incandescent lamps in illuminated units.	OR-44	Rubber tool used for replacing LED and incandescent lamps.		
Lens Removal Tool		For illuminated pushbuttons and pilot lights.	MT-101	Used for removing the lens or button from the housing.		
LED Lamp		5V DC 6V AC/DC 12V AC/DC 24V AC/DC 120V AC	LFTD-5Ⓢ LFTD-6Ⓢ LFTD-1Ⓢ LFTD-2Ⓢ LFTD-H2Ⓢ	T 1-3/4 miniature flange base. In place of Ⓢ specify LED Color Code (A, G, R, S, W, Y).		
Incandescent Lamp		6V AC/DC 12V AC/DC 24V AC/DC	LH-06 LH-14 LH-28	0.5W, T 1-3/4 miniature flange base		
Switch Guard		90 degrees opening maintained	Round/Square AL-K6 Rectangular AL-KH6	Prevents inadvertent switch operation. IP40 dust-tight rated.		
		180 degrees opening, spring return	Round/Square AL-K6SP Rectangular AL-KH6SP Oversize Round/Sq HA9Z-K1		Prevents inadvertent switch operation. IP65 oiltight rated.	
		Dust-proof Cover		For round units		AL-D6
				For square units	AL-DQ6	
For rectangular units	AL-DH6					
Terminal Cover		Made of white nylon	All removable contacts	H6-VL2	Covers terminals to prevent possible electric shock.	
			Unibody Pilot Lights	H6-PVL		
Mounting Hole Plug		Rubber	AL-B6	Fills unused panel cutouts. Made of nitrile rubber. Push-in installation from front of panel. IP65 (oiltight) rated.		
		Aluminum	AL-BM6	Fills unused panel cutouts. Made of aluminum. Screw-on locking ring from inside of panel. IP65 (oiltight) rated.		
Replacement Keys		for LA1K, LA2K, LA3K (#132)	AS6-SK	Pair of keys.		
		for HA1K (#231) – oversize	KG9Z-SK			
Replacement Engraving Inserts			Round AL6M-W Square AL6Q-W Rectangle AL6H-W Oversize Round HA9Z-P1-W Oversize Square HA9Z-P2-W Mushroom HA9Z-P13-W			
Replacement Locking Ring		All models		HA9Z-LN		
Replacement Anti-Rotation Ring			L6 standard	AL6-LP	Prevents rotation of switches in panel. (included with all assembled switches)	
			L6 oversize	HA9Z-LP		
Replacement Selector Inserts				HA9Z-HC1-Ⓢ	Applicable to round oversize selectors only Ⓢ = (G, R, S, W, Y)	
Replacement Safety Lever Lock				HA9Z-LS		

Switches & Pilot Lights









Display Lights


Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

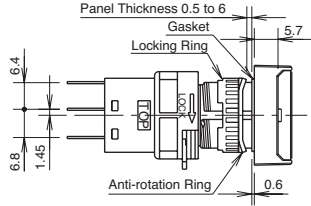
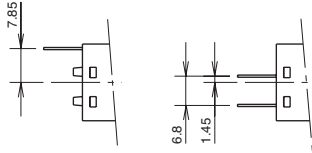
Appearance	Description	Used With	Part Number
	ø24mm round, metal (aluminum color), panel cut-out ø20.2mm	 L6 Switch +  Flush Bezel =  Flush Switch	LA9Z-SM61
	ø24mm round, plastic (black), panel cut-out ø20.2mm		LA9Z-S61B
	□24mm square, plastic (black), panel cut-out □20.2mm		LA9Z-S71B
	24 x 30mm rectangular, plastic (black), panel cut-out ø20.2 x 26.2mm		LA9Z-S81B
	Rectangular, plastic (black)		LA9Z-KS8

 Flush bezels not applicable for oversize units.

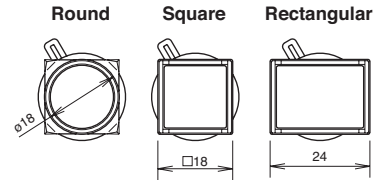
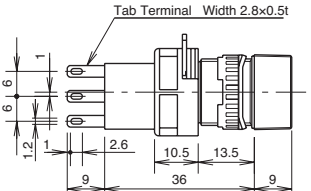
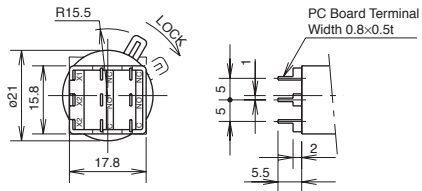
**Dimensions (mm)**

**Pilot Lights (LA\*P,) Pushbuttons (LA\*B)**

**Illuminated Pushbuttons (LA\*L)**



Note:  
 1. Pushbuttons do not have lamp terminals.  
 2. Pilot lights have only lamp terminals.

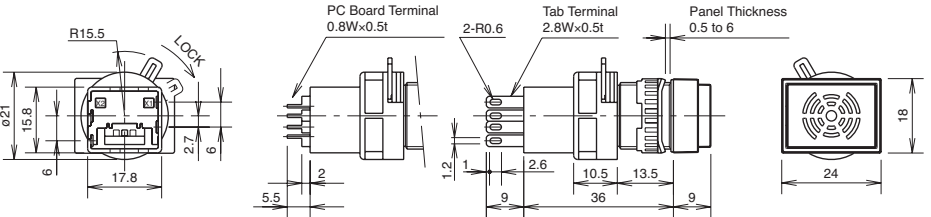
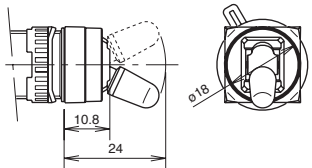


PC Board Terminal

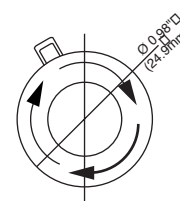
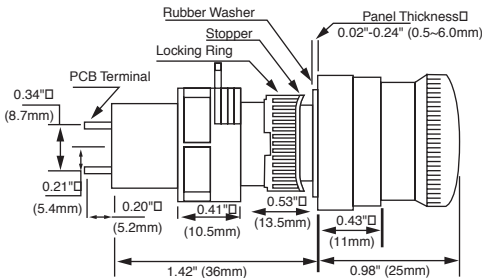
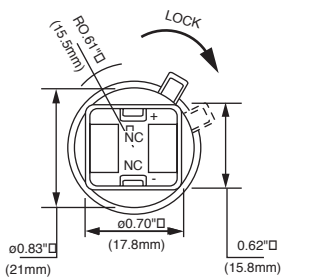
Solder/Tab Terminal

**Lever Switches (LA1T)**

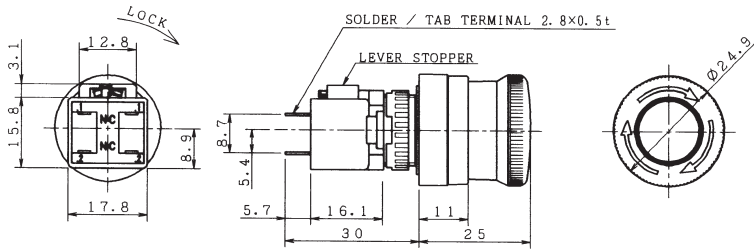
**Buzzer (LA3Z)**



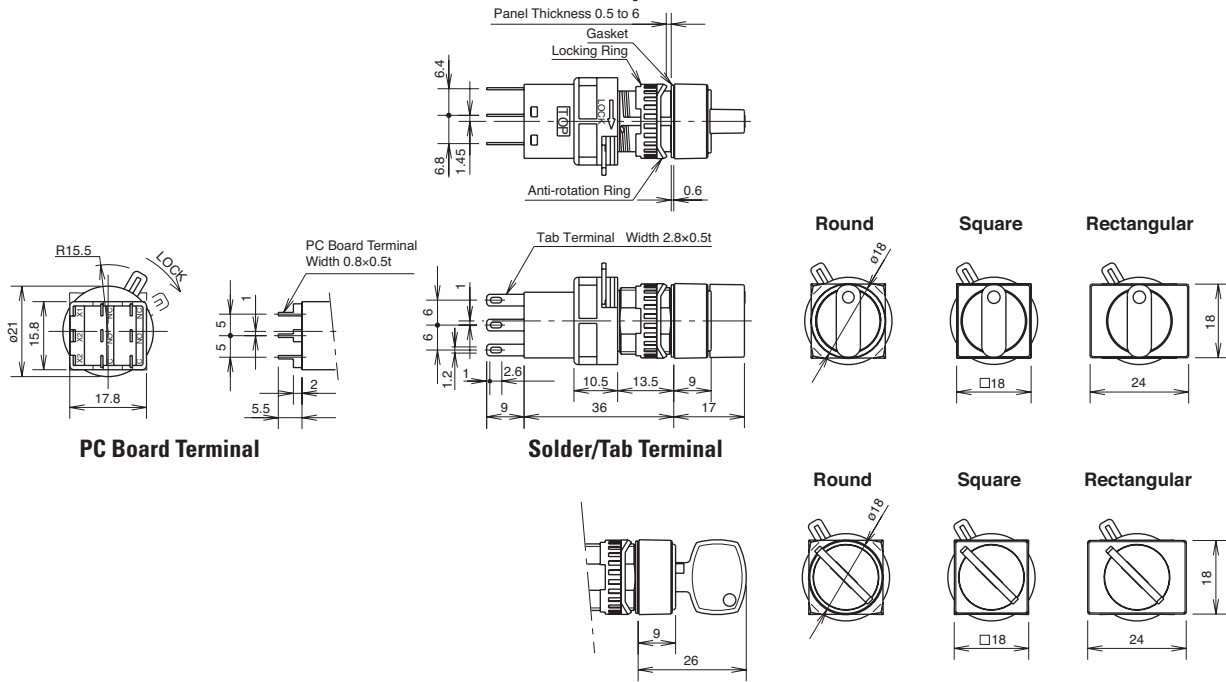
**Emergency Stop Switch (HA1B)**



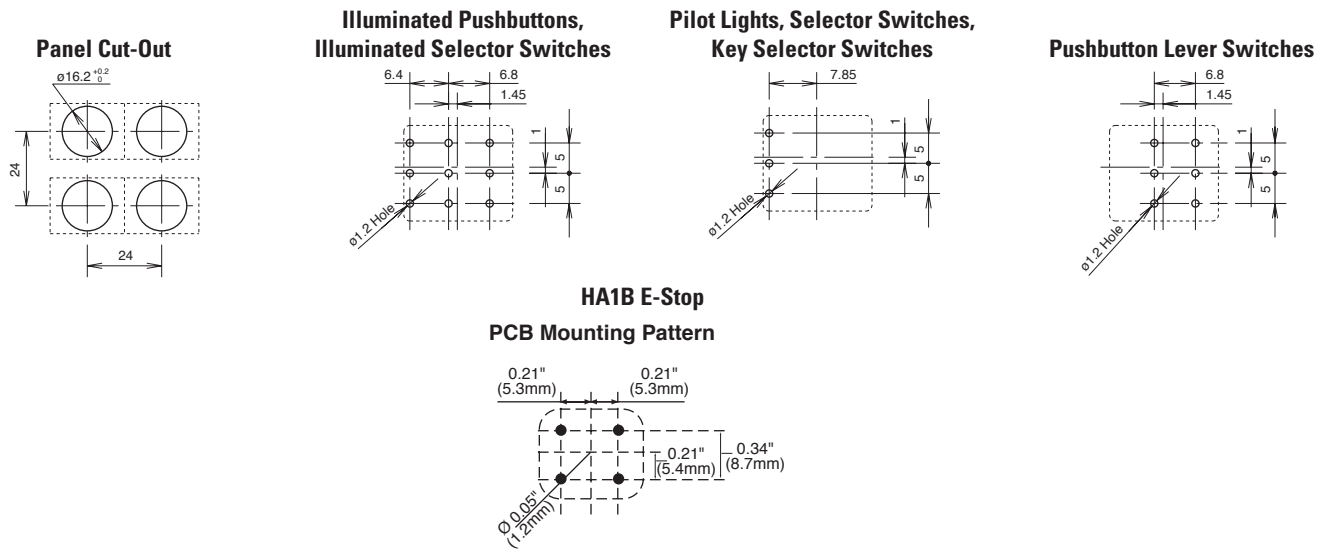
Emergency Stop Switch (HA1E) - Short Body Style

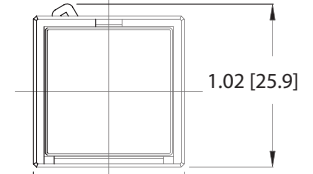
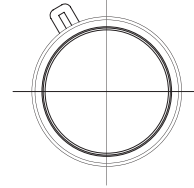
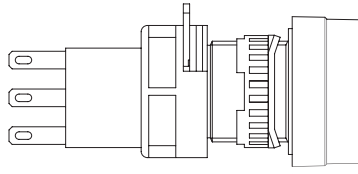
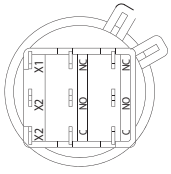


Selector Switches (LA\*S), Illuminated Selector Switches (LA\*F), Key Selector Switches (LA\*K)

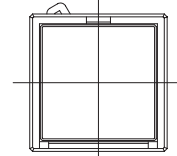
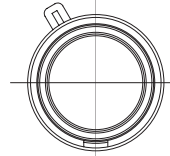
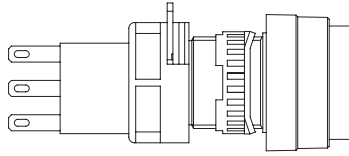
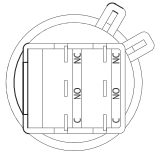


PC Board Drilling Layout (Bottom View)

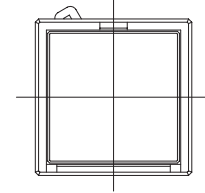
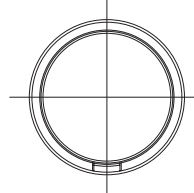
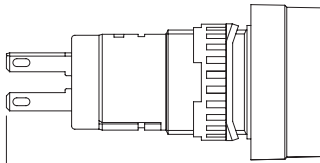
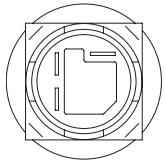


**Enlarge Flush Pushbutton and Pilot Lights**

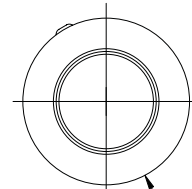
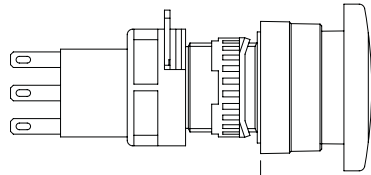
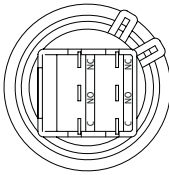
0.43 [11.0]

1.02 [25.9]  
0.94 [24.0]**Enlarge Extended Non-Illuminated Pushbutton**

0.59 [15.1]

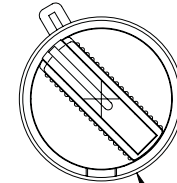
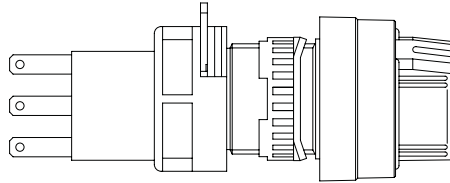
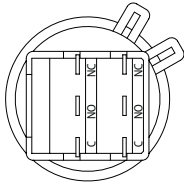
**Enlarge Unibody Pilot Lights**

1.48 [37.5]

**Mushroom Pushbuttons**

1.18 [30.0]

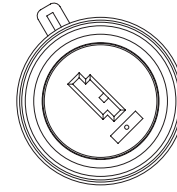
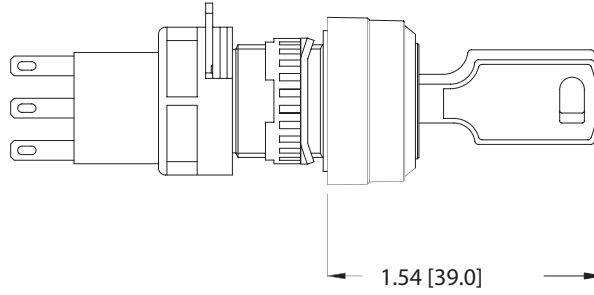
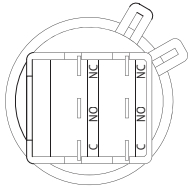
0.79 [20.0]

**Enlarge Selector Switch**

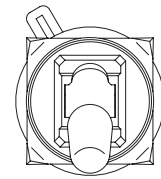
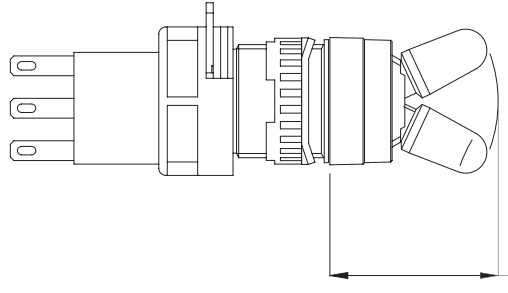
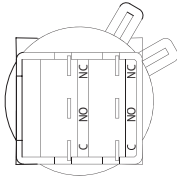
0.94 [23.8]

0.77 [19.5]

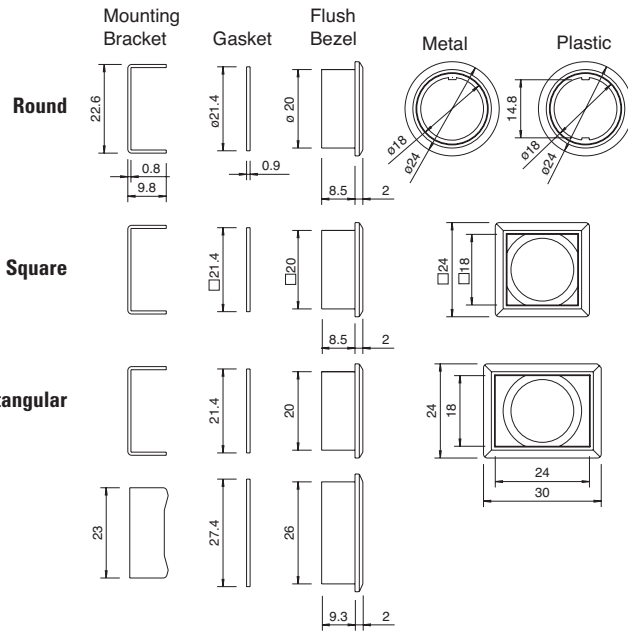
Oversize Key Switch



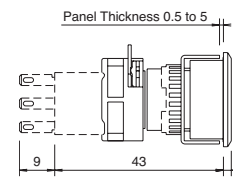
Lever Switch



Flush Bezel

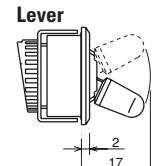
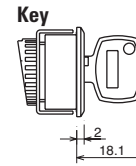
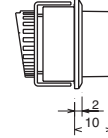


Flush Bezel with Switch



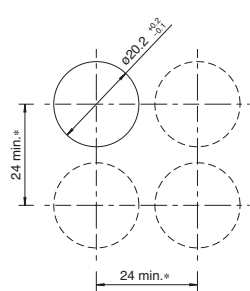
Selector Switches

Illuminated & Non-illuminated

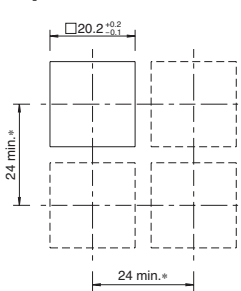


Flush Bezel Mounting Hole Layout

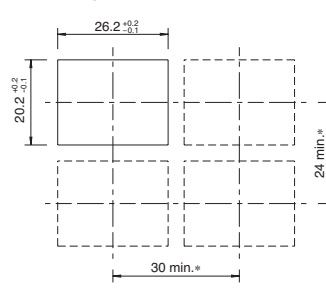
Round



Square



Rectangular



Switches & Pilot Lights

Display Lights

Relays & Sockets

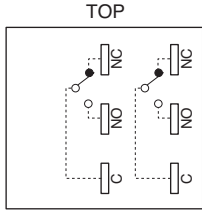
Timers

Terminal Blocks

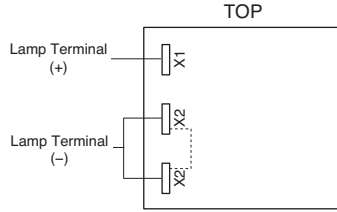
Circuit Breakers



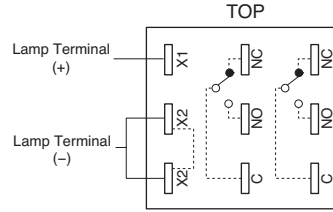
**Terminal Configurations**  
**Non Illuminated Pushbutton**



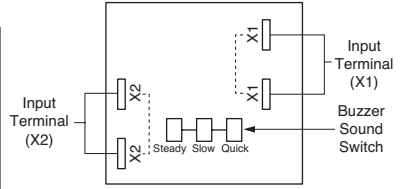
**Pilot Lights**



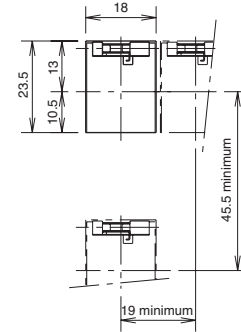
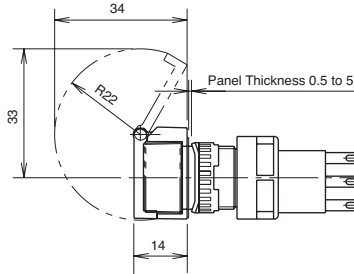
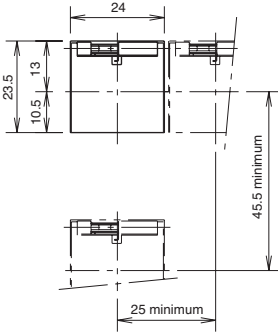
**AL-K6SP**  
**Illuminated Pushbuttons**



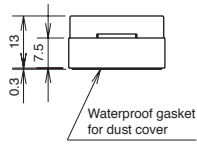
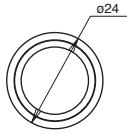
**Buzzer**



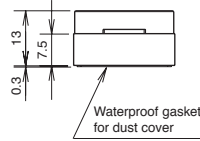
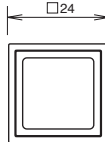
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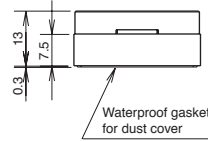
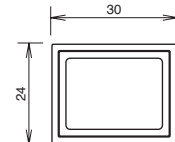
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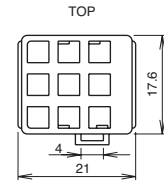
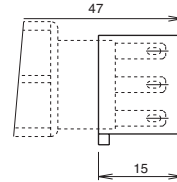
**AL-DQ6**



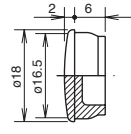
**AL-DH6**



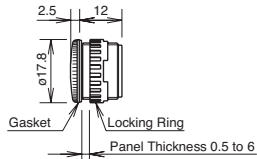
**H6-VL2**



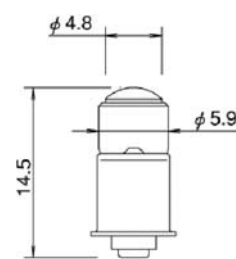
**AL-B6**



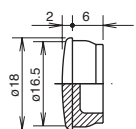
**AL-BM6**



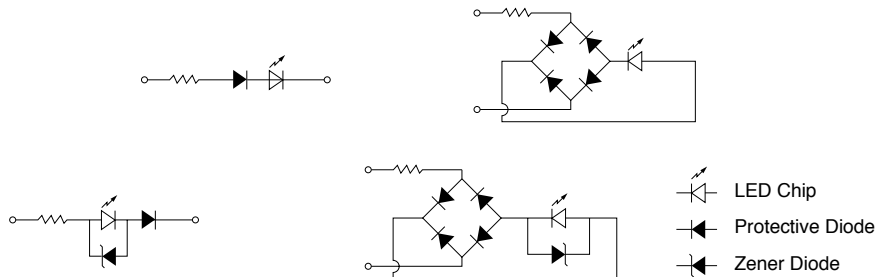
**LFTD**



**AL-B6**



**LED Lamp**  
**Internal Circuit**



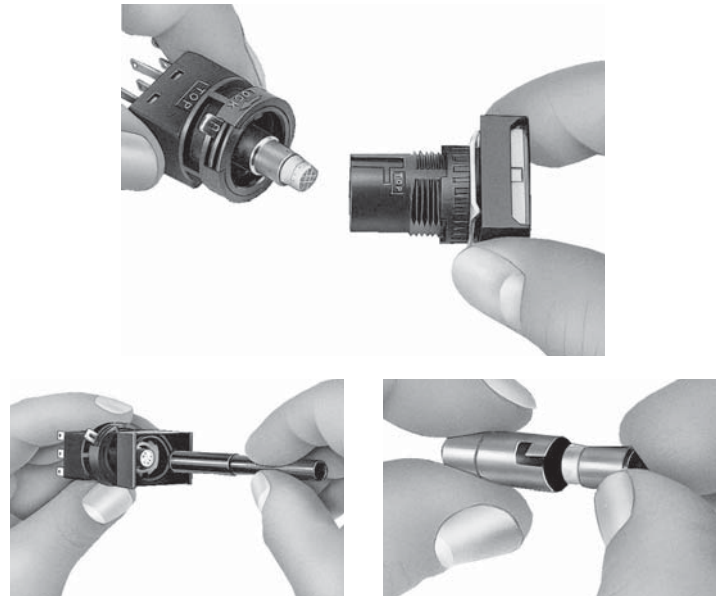
## General Instructions

### Pushbutton Assembly

#### Lamp Installation

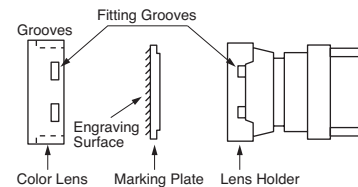
Lamps can be replaced in two ways:

1. If contacts are accessible (or pushbutton not installed in a panel) then it is easiest to first remove the contacts from the operator. This will allow easy access to the lamp/lamp-holder assembly. Grab lamp, depress slightly, and turn counter clockwise. Lamp can then be removed by pushing it back through the lamp holder.
2. If contacts are not accessible, then the lamp can be replaced by first removing the lens from the operator. Just pull lens straight out either with a fingernail or optional lens removal tool (MT-101). Lamp/lamp-holder assembly can then be removed with lamp removal tool (OR-44). Insert lamp removal tool through operator, depress slightly, turn counter clockwise, then pull lamp/lamp-holder assembly out. Lamp can then be removed by pushing it back through the lamp holder.



#### Engraving Lenses

All buttons and lenses can be engraved directly on the outside surface. Illuminated lenses also allow for engraving on a plate that is underneath the colored section of the lens. Remove the colored section of the lens by pulling on the edge while simultaneously unhooking it from the latches on the lens holder. The marking plate will then be accessible. It can then be engraved or a thin marked insert (such as mylar or paper) can be sandwiched between the marking plate and colored section of the lens.

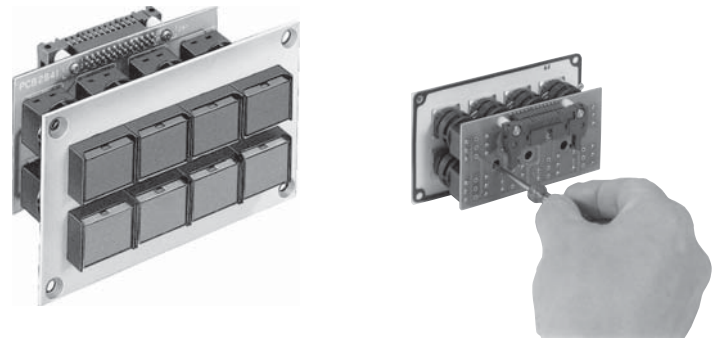


#### Panel Mounting

Before any unit can be mounted into a panel, the contact block must be removed. Slide metal locking lever and pull contact off. Loosen and remove the locking ring and square anti-rotation ring from the operator and insert operator through panel cutout from the front of the panel. Slide on anti-rotation ring and tighten locking ring, using locking ring wrench (MT-001). Slide contact block onto operator, observing TOP marking on both parts. Slide metal locking lever in direction indicated by LOCK. The yellow plastic safety lever lock can then be snapped onto the locking lever; this will prevent vibration or maintenance actions from releasing the contact from the operator.

#### PCB Mounting

Being able to separate the contacts from the operator allows for assembly of the front panel components (operator and lens) to be performed in tandem with the PC board assembly and soldering. For applications where multiple rows of push-buttons are mounted closely together, or where other components may obstruct access to the contact locking lever, be sure to include access holes in the PC board (refer to PC board layout dimensions for location). Also be sure to allow for space above and to the side of contact to ensure that no components block the contact block locking lever. PC board pins are designed to rest on the PCB, take this into consideration to ensure that pins do not short closely spaced traces.



## 22mm XW E-Stops

### Key features:

- The depth behind the panel is only 48.7 mm for 1 to 4 contacts (with terminal cover) for illuminated and non-illuminated units.
- IDEC's original "Safe break action" ensures that the NC contacts open when the contact block is detached from the operator.
- 1 to 4NC main contacts and 1 or 2NO monitor contacts
- Push-to-lock, Pull or Turn-to-reset operator
- Safety lock mechanism (IEC60947-5-5, 6.2)
- Degree of protection IP65 (IEC60529)
- Fingersafe (IP20) terminals
- Two button sizes:  $\varnothing 40$  and  $\varnothing 60$  mm
- Push-ON illumination type available (40mm mushroom head)
- Direct opening action mechanism (IEC60947-5-5, 5.2, IEC60947-5-1, Annex K)
- RoHS compliant (EU directive 2002/95/EC).
- UL c-UL listed. EN compliant
- UL NISD category emergency stop device (File# E305148)



UL File #E68961



CCC No. 2005010305150897



### Specifications

<b>Applicable Standards</b>	IEC60947-5-1, EN60947-5-1, IEC60947-5-5, EN60947-5-5, UL508, CSA C22.2 No. 14
<b>Operating Temperature</b>	Non-illuminated: -25 to +60°C (no freezing), Illuminated: -25 to +55°C (no freezing)
<b>Operating Humidity</b>	45 to 85% RH (no condensation)
<b>Storage Temperature</b>	-45 to +80°C
<b>Operating Force</b>	Push-to-lock: 32N Pull-to-reset: 21N Turn-to-reset: 0.27N·m
<b>Minimum Force Required for Direct Opening Action</b>	80N
<b>Min Operator Stroke Required for Direct Opening Action</b>	4mm
<b>Maximum Operator Stroke</b>	4.5mm
<b>Contact Resistance</b>	50m $\Omega$ maximum (initial value)
<b>Contact Material</b>	Gold plated silver
<b>Insulation Resistance</b>	100M $\Omega$ minimum (500V DC megger)
<b>Impulse Withstand Voltage</b>	2.5kV
<b>Pollution Degree</b>	3
<b>Operation Frequency</b>	900 operations/hour
<b>Shock Resistance</b>	Operating extremes: 150m/s <sup>2</sup> (15G), Damage limits: 1000m/s <sup>2</sup> (100G)
<b>Vibration Resistance</b>	Operating extremes: 10 to 500Hz, amplitude 0.35mm acceleration 50m/s <sup>2</sup> Damage limits: 10 to 500Hz, amplitude 0.35mm acceleration 50m/s <sup>2</sup>
<b>Mechanical Life</b>	250,000 operations minimum
<b>Electrical Life</b>	100,000 operations minimum, (250,000 operations minimum @ 24V AC/DC, 100mA)
<b>Degree of Protection</b>	Operator: IP65 (IEC60529) Terminal: IP20 (when XW9Z-VL2MF is installed)
<b>Terminal Style</b>	M3.0 screw terminal
<b>Recommended Tightening Torque for Locking Ring</b>	2.0N·m
<b>Wire Size</b>	16 AWG max
<b>Weight</b>	$\varnothing 40$ mm: 72g $\varnothing 60$ mm: 81g

Switches &amp; Pilot Lights

Display Lights



Relays &amp; Sockets

Timers

Terminal Blocks

Circuit Breakers

## Part Numbers


Illumination	Operator Type	Monitor Contact	Main Contact	Part Number
Non-Illuminated 	40mm Mushroom	1NO	1NC	XW1E-BV411M-R
		–	2NC	XW1E-BV402M-R
		2NO	2NC	XW1E-BV422M-R
		1NO	3NC	XW1E-BV413M-R
	60mm Mushroom	–	4NC	XW1E-BV404M-R
		1NO	1NC	XW1E-BV511M-R
		–	2NC	XW1E-BV502M-R
		2NO	2NC	XW1E-BV522M-R
Illuminated <sup>1</sup> 	40mm Mushroom LED with built-in 24V AC/DC LED	1NO	3NC	XW1E-BV513M-R
		–	4NC	XW1E-BV504M-R
		2NO	2NC	XW1E-LV411Q4M-R
		–	2NC	XW1E-LV402Q4M-R
		1NO	2NC	XW1E-LV422Q4M-R
	40mm Mushroom Push-ON LED <sup>2</sup>	1NO	3NC	XW1E-LV413Q4M-R
		–	4NC	XW1E-LV404Q4M-R
		1NO	2NC	XW1E-TV412Q4M-R



1. The light is independent of the position of the switch, except for push-on LED type.
2. The light only operates when the switch is pressed as it is internally wired.

**Contact Ratings**

<b>Rated Insulation Voltage (Ui)</b>		250V				
<b>Rated Current (Ith)</b>		5A				
<b>Rated Operating Voltage (Ue)</b>		30V	125V	250V		
<b>Rated Operating Current</b>	<b>Main Contacts (NC)</b>	AC 50/60Hz	Resistive Load (AC-12)	–	5A	3A
			Inductive Load (AC-15)	–	3A	1.5A
	DC	Resistive Load (DC-12)	2A	0.4A	0.2A	
		Inductive Load (DC-13)	1A	0.22A	0.1A	
<b>Rated Operating Current</b>	<b>Monitor Contacts (NO)</b>	AC 50/60Hz	Resistive Load (AC-12)	–	1.2A	0.6A
			Inductive Load (AC-14)	–	0.6A	0.3A
	DC	Resistive Load (DC-12)	2A	0.4A	0.2A	
		Inductive Load (DC-13)	1A	0.22A	0.1A	

 Minimum applicable load: 5V AC/DC, 1mA (reference value).  
The rated operating currents are measured at resistive/inductive load types specified in IEC 60947-5-1.

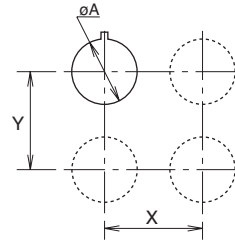
**Illuminated Unit LED Ratings**

Operating Voltage	Current
24V AC/DC ±10%	15mA

**Depth Behind the Panel**

Depth (mm)	Description
48.7	1 - 4 contacts, both illuminated and non-illuminated

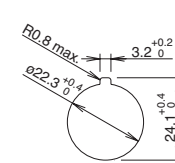
**Mounting Hole Layout**



Measurements

Size	øA	X & Y
40mm	22.3 <sup>+0.4</sup>	70mm min

**Panel Cutout**

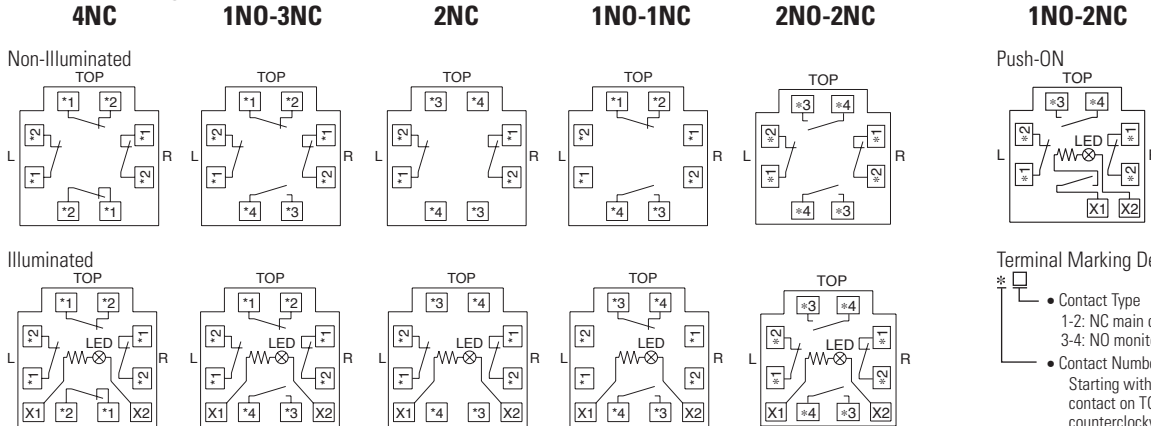


**Part Number Key**

**XW1E - L V 4 11 Q4M - R**

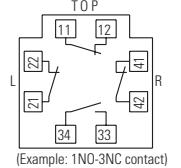
- Illumination**
  - B: Non-Illuminated
  - L: Illuminated LED
  - T: Illuminated Push-ON LED
- Mushroom Size**
  - 4: ø40mm
  - 5: ø60mm (non-illuminated only)
- Contact Configuration**
  - 11: 1NO - 1NC
  - 02: 2NC
  - 13: 1NO - 3NC
  - 04: 4NC
  - 22: 2NO-2NC
  - 12: 1NO-2NC (Push-ON LED only)
- Voltage Code**
  - Blank: Non-illuminated
  - Q4: Illuminated 24V AC/DC

**Terminal Arrangements (Bottom View)**



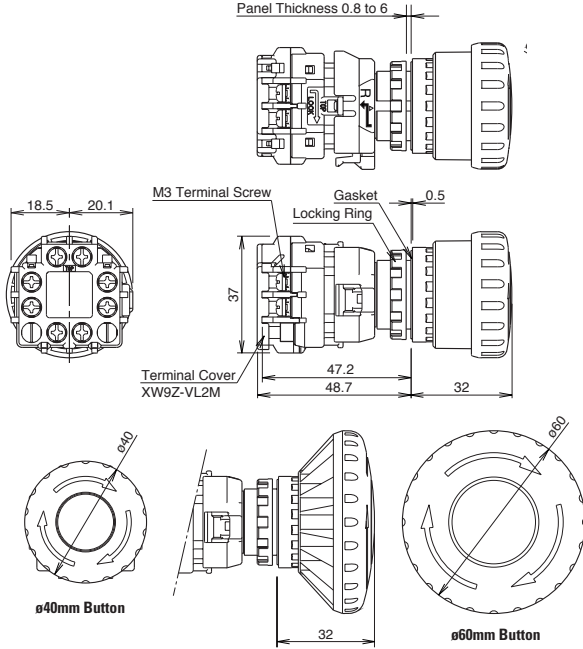
**Terminal Marking Description**

- Contact Type
  - 1-2: NC main contact
  - 3-4: NO monitor contact
- Contact Number (1-4)
  - Starting with the contact on TOP in a counterclockwise direction.
  - Note:
    - 1: contact on the TOP
    - 2: contact on the Left
    - 3: contact on the Bottom
    - 4: contact on the Right

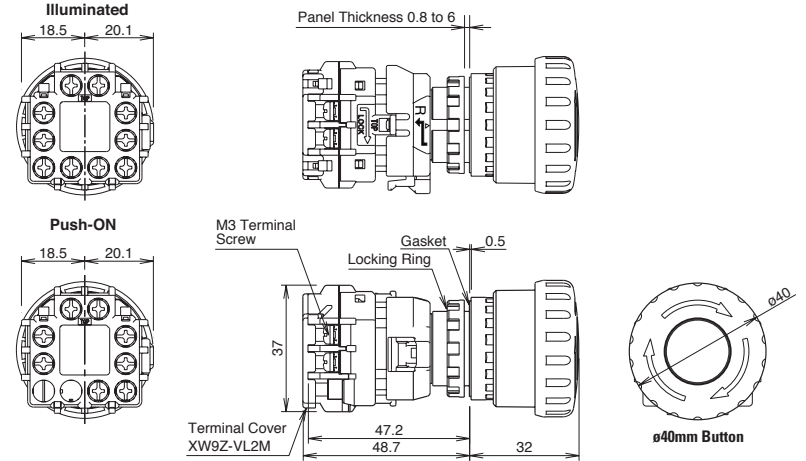


Dimensions (mm)

XW Non-Illuminated (with terminal cover)



XW LED Illuminated/Push-ON (with terminal cover)



Accessories: Terminal Covers

Model	Description	Part Numbers
	Terminal Cover for contact block	XW9Z-VL2M
	IP20 Fingersafe Cover	XW9Z-VL2MF

Accessories: Shrouds

	Part Numbers	E-Stop Types	Applicable Standards
	HW9Z-KG1	40mm Mushroom Head	SEMI S2-0703, 12.5.1 Compliant
	HW9Z-KG2	40mm, and 60mm Mushroom Head	SEMI S2-0703, 12.5.1 & SEMATECH Compliant
	HW9Z-KG3	40mm Mushroom Head	SEMI S2 Compliant (Approved by TUV)
	HW9Z-KG4	40mm Mushroom Head	SEMI S2 Compliant (Approved by TUV) & SEMATECH

Accessories: Nameplates

	Legend	Part Number	Inner Ø	Outer Ø
	(blank)	HWAV-0	22mm	60mm
	"Emergency Stop"	HWAV-27	22mm	60mm
	"Emergency Stop"	HWAV5-0	22mm	80mm
	(blank)	HWAV5-27	22mm	80mm

Use 60mm nameplates for 40mm mushroom buttons and 80mm nameplates for 60mm mushroom buttons.

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

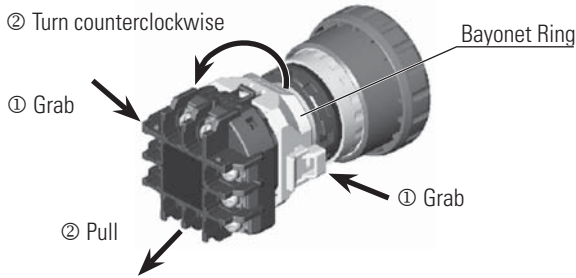
Terminal Blocks

Circuit Breakers

Operating Instructions

Removing the Contact Block

First unlock the operator button. Grab the bayonet ring ① and pull back the bayonet ring until the latch pin clicks ②, then turn the contact block counterclockwise and pull out ③.

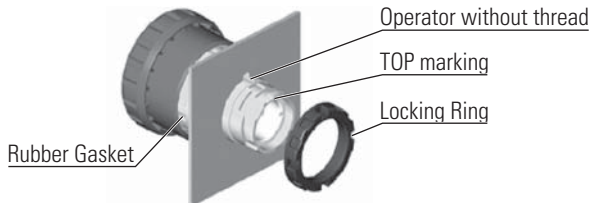


Notes for removing the contact block

1. When the contact block is removed, the monitor contact (NO contact) is closed.
2. While removing the contact block, do not exert excessive force, otherwise the switch may be damaged.
3. An LED lamp is built into the contact block for illuminated pushbuttons. When removing the contact block, pull the contact block straight to prevent damage to the LED lamp. If excessive force is exerted, the LED lamp may be damaged and fail to light.

Panel Mounting

Remove the locking ring from the operator and check that the rubber gasket is in place. Insert the operator from panel front into the panel hole. Face the side without thread on the operator with TOP marking upward, and tighten the locking ring using ring wrench MW9Z-T1 to a torque of 2.0 N·m maximum.

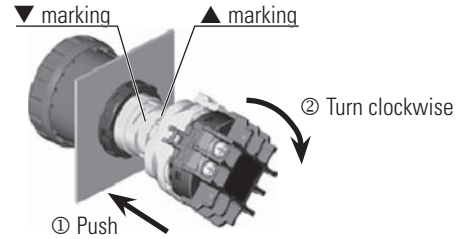


Notes for Panel Mounting

To prevent the XW emergency stop switch from rotating when resetting from the latched position, use of an anti-rotation ring (HW9Z-RL) or a nameplate is recommended.

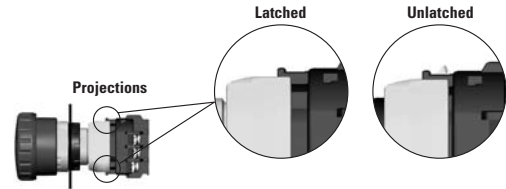
Installing the Contact Block

First unlock the operator button. Align the small t marking on the edge of the operator with the small s marking on the yellow bayonet ring. Hold the contact block, not the bayonet ring. Press the contact block onto the operator and turn the contact block clockwise until the bayonet ring clicks.



Notes for installing the contact block

Make sure that the bayonet ring is in the locked position. Check that the two projections on the bayonet ring are securely in place.



Wiring

The applicable wire size is 16 AWG maximum.

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers



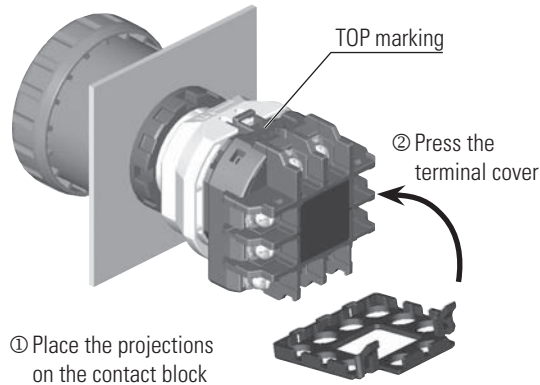
### Screw Terminal

1. Wire thickness: AWG18 to 16
2. Tighten the M3 terminal screw to a tightening torque of 0.6 to 1.0 N·m.

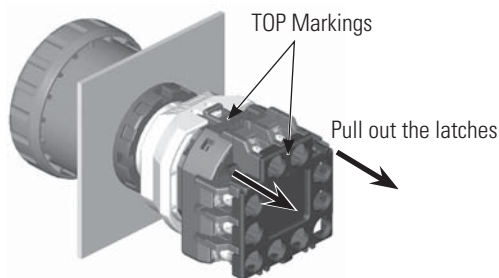
### Installing and Removing Terminal Covers

#### XW9Z-VL2M

To install the terminal cover, align the TOP marking on the terminal cover with the TOP marking on the contact block. Place the two projections on the bottom side of the contact block into the slots in the terminal cover. Press the terminal cover toward the contact block.

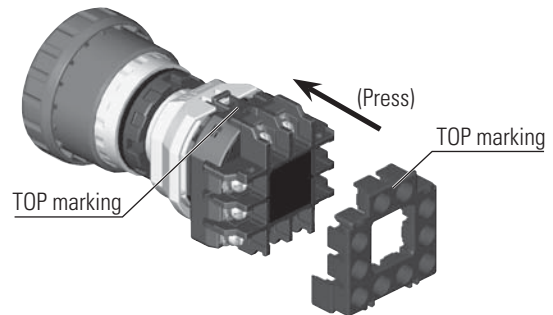


To remove the terminal cover, pull out the two latches on the top side of the terminal cover. Do not exert excessive force to the latches, otherwise the latches may break.



### IP20 Protection Terminal Cover XW9Z-VL2MF

To install the IP20 protection cover, align the TOP marking on the cover with the TOP marking on the contact block, and press the cover toward the contact block.



1. Once installed, the XW9Z-VL2MF cannot be removed.
2. The XW9Z-VL2MF cannot be installed after wiring.
3. With the XW9Z-VL2MF installed, crimping terminals cannot be used.
4. Make sure that the XW9Z-VL2MF is securely installed. IP20 protection cannot be achieved when installed loosely, and electric shocks may occur.

### Contact Bounce

When the button is reset by pulling or turning, the NC main contacts will bounce. When pressing the button, the NO monitor contacts will bounce.

When designing a control circuit, take the contact bounce time into consideration (reference value: 20 ms).

### LED Illuminated Switches

LED lamp is built into the contact block and cannot be replaced.

### Installing the Anti-rotation Ring HW9Z-RL

Align the side without thread on the operator with TOP marking, the small s marking on the anti-rotation ring, and the recess on the mounting panel.

