

Compact High-capacity Push-button Switch

- •Ideal for use as a high breaking capacity Power Switch.
- Switches from micro load (minimum applicable load: 5 VDC 1mA) to high capacity load.

5 VDC TITA) to high capa

RoHS Compliant

Refer to Safety Precautions for All Pushbutton Switches and Safety Precautions on page 8.

List of Models



Lighted Push-button Switches



Model Number Structure

■Model Number Legend (Ordering as a Set).....

The model numbers used to order sets of Units are illustrated below. One set comprises the Pushbutton (LED lamp built-in) and Switch. For information on combinations, refer to Ordering Information.



non-lighted models.

Specifications: Refer to page 3.Accessories: Refer to page 2.

■Dimensions: Refer to page 5.

List of Models

SPST-NO

Appearance	Terminal	Operation	Illumination	Model	Color symbol for pushbutton	Minimum packing unit
Square/A3AA		Momentary	Non-lighted	A3AA-90K1-00	-	
	Solder		LED surface illumination	A3AA-90K1-00E		
	Solder	Alternate	Non-lighted	A3AA-90L1-00		
		Allemale	LED surface illumination	A3AA-90L1-00E] 	100
		Momentory	Non-lighted	A3AA-91K1-00	(Non-lighted) R (red)	
	РСВ	Momentary	LED surface illumination	A3AA-91K1-00E	Y (yellow) G (green) L (light gray) A (blue) B (black) D (dark gray) H (gray) (Surface illumination) R (red) Y (yellow) G (green)	
	РСВ	Alternate	Non-lighted	A3AA-91L1-00		
			LED surface illumination	A3AA-91L1-00E		
Round/A3AT		Solder Alternate	Non-lighted	A3AT-90K1-00		
	Calder		LED surface illumination	A3AT-90K1-00E		
12 - C	Solder		Non-lighted	A3AT-90L1-00		
			LED surface illumination	A3AT-90L1-00E		
		Momentary	Non-lighted	A3AT-91K1-00		
	PCB		LED surface illumination	A3AT-91K1-00E		
	FUB	Altornata	Non-lighted	A3AT-91L1-00		
		Alternate	LED surface illumination	A3AT-91L1-00E		

Note: The above models each have a SPST-NO contact that can switch 6 A at 125 VAC, 2 A at 250 VAC, and 4 A at 30 VDC. When ordering any of the above models, replace
of the model number with a code to indicate the pushbutton color of the model (i.e., replace
with R, Y, G, L, A, B, D, H, and L). The pushbutton of an A3A does not illuminate if the color of the pushbutton is dark gray, gray, light gray, blue, or black.

SPDT

A 3 A

Appearance	Terminal	Operation	Illumination	Model	Color symbol for pushbutton	Minimum packing unit
Square/A3AA		Momentary	Non-lighted	A3AA-90A1-00		100
	Solder		LED surface illumination	A3AA-90A1-00E		
	Soluei	Alternate	Non-lighted	A3AA-90B1-00		
		Allemale	LED surface illumination	A3AA-90B1-00E		
		Momenteri	Non-lighted	A3AA-91A1-00	(Non-lighted) R (red)	
	РСВ	Momentary	LED surface illumination	A3AA-91A1-00E	Y (yellow) G (green) L (light gray) A (blue) B (black) D (dark gray) H (gray) (Surface illumination) R (red) Y (yellow) G (green)	
	РСВ	Alternate	Non-lighted	A3AA-91B1-00		
			LED surface illumination	A3AA-91B1-00E		
Round/A3AT		Momentary	Non-lighted	A3AT-90A1-00		
	Solder		LED surface illumination	A3AT-90A1-00E		
	Solder		Non-lighted	A3AT-90B1-00		
		Alternate	LED surface illumination	A3AT-90B1-00E		
		Mamantan	Non-lighted	A3AT-91A1-00		
	РСВ	Momentary	LED surface illumination	A3AT-91A1-00E		
	FUB	Altornata	Non-lighted	A3AT-91B1-00		
		Alternate	LED surface illumination	A3AT-91B1-00E		

Accessories

Flange (Select according to panel color.)

Name		Shape	Classification		Model	Minimum packing unit
	Square			Black	A3A-241	
	12.7		Light gray	A3A-242		
	Round (0	Flange alone	Black	A3A-251	
	φ12.7	12.7		Light gray	A3A-252	_
Flange		\Diamond	Leaf spring		A3A-200	100
Square □12.7	Square		Flange and leaf	Black	A3A-211	_
	□12.7			Light gray	A3A-212	_
	Round ¢12.7	0	spring (one each)	Black	A3A-221	
			Light gray	A3A-222	1	

Note: An A3A with solder terminals is provided with a round or square black flange and leaf spring. A round black flange is provided with each A3A having solder terminals and a round pushbutton. A square black flange is provided with each A3A having solder terminals and a square pushbutton.

Specifications

Approved Standards

	• SPST-NO	• SPDT
UL	6 A at 125 VAC	3 A at 125 VAC
CSA	2 A at 250 VAC	2 A at 30 VDC
	[/] 4 A at 30 VDC	

■Ratings

Item Type Contact form		AC resistive load	DC resistive load
General load	SPST-NO	6 A at 125 VAC 2 A at 250 VAC	4 A at 30 VDC

Note: Minimum allowable load: 5 VDC 1 mA (Resistive) The ratings given above are for testing under the following conditions: (1) Ambient temperature: 20 ±2°C

(2) Ambient humidity: 65 ±5%

(3) Operating frequency: 20 times/minute

LED

	Surface illumination			
Item	Red	Yellow	Green	
Forward voltage VF	Standard value (V) * (I⊧ = 10 mA)	2.0	2.1	2.1
	Maximum value (V)		3.0	
Forward current IF	Maximum value (mA)	20	20	25
Permissible loss PD	Maximum value (mW)	60	60	75
Reverse voltage VR	Maximum value (V)		3	

Note: The above built-in LEDs do not have a resistor. Connect to each of the above built-in LEDs a resistor that satisfies the above conditions.

Refer to the $V_F - I_F$ characteristic graphs on page 8.

Operating Characteristics

Operating force	OF max.	2.45 N
Release force	RF min.	0.15 N
Total travel	TT	Approx. 2mm
Pretravel	PT max.	1.5 mm
Locktravel alternate *	LTA min.	0.5 mm

Alternate operation models only.

■Charac	Characteristics				
Operating	Mechanical	Momentary action: 120 operations/minute max. Alternate action: 60 operations/minute max. *1			
frequency	Electrical	20 operations/minute max.			
Insulation rea	sistance	100 MΩ min. (at 500 VDC)			
Contact resis	stance	100 m Ω max. (initial value)			
Dielectric	Between terminals of same polarity	600 VAC, 50/60 Hz for 1 min			
strength	Between each terminal and ground	2,000 VAC, 50/60 Hz for 1 min			
Vibration resistance Malfunction		10 to 55 Hz, 1.5-mm double amplitude *2			
Shock	Destruction	500 m/s ²			
resistance	Malfunction	150 m/s² *2			
Durability	Mechanical	Momentary action: 1,000,000 operations min. Alternate action: 50,000 operations min. *1			
	Electrical	50,000 operations min.			

3 (IEC947-5-1) With alternate operation models, one operation cycle consists of set and *1. reset operations.

Approx. 3.2 g

35% to 85%

IP00

175

Class II

-10°C to +55°C (with no icing)

-25°C to +65°C (with no icing)

*2. Indicates malfunctions of less than 1 ms.

■Contact Form

Weight

Ambient operating

Ambient storage

Pollution degree

Degree of protection Electric shock protection

PTI (proof tracking index)

Ambient operating humidity

temperature

temperature

class

Contact name	Contact form	Contact type
Double-break	SPST-NO	NO NO
Double-throw	SPDT	COM NC

A 3 A

Nomenclature

Model Structure <Pushbutton> 1. Shape Square (A3AA) 4.Color cap Round (A3AT) Diffusion sheet (milky white) 5. Color Non-lighted Model Red, yellow, light gray, gray, dark gray, Flangé green, blue, black • Surface Illumination Model Red, yellow, green <Switch> 3. Ratings Leaf spring Standard load 6 A at 125 VAC 2 A at 250 VAC 4 A at 30 VDC * Minimum applicable load: 1 mA at 5 VDC (resistive load) 2. Terminals Solder terminal • PCB terminal

Note 1. The above is for the A3AA.

2. An A3A with solder terminals is provided with a black flange and leaf spring, however an A3A with PCB terminals is not provided with them. If a black flange and leaf spring are required for an A3A with PCB terminals, order them from your OMRON representative. (Refer to page 2.)

A3A

(Unit: mm)

Dimensions



Note: All units are in millimeters unless otherwise indicated.

The illustrations below show switches with solder terminals, without a flange or leaf spring. Unless specified, there is a tolerance of ±0.4mm for dimensions.

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■Accessories Dimensions



Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

■Panel Cutouts

Square Pushbutton



Round Pushbutton





Panel Mounting Dimensions



⁽The diagram shows the lighted SPST-NO model.)

Precautions

•Refer to the "Push-button Switches Common Precautions" for correct use.

Precautions for Correct Use

- · Please do not perform wiring or touch the charged parts of terminals while power is supplied to the Switch.Doing so may result in electric shock.
- · Make sure to keep a secure insulation distance after wiring to the Switch.

Mounting

- When opening a hole on a panel to mount an A3A to the panel, make sure that the hole has no burr.
- · When mounting a flange to the switching mechanism of an A3A, make sure that the flange and the casing of the switching mechanism are engaged securely.

Wiring

- · When soldering the terminals of an A3A, refer to the following.
- 1. For manual soldering: Use a soldering iron with the terminals at a temperature of 350°C maximum within three seconds.
- 2. Do not impose any external force on the terminals for one minute after the terminals are soldered.
- · Do not pull the terminals of any A3A with a force exceeding 5.34 N, otherwise the joint part of the A3A may be damaged.
- · When soldering the terminals of an A3A, apply non-corrosive rosin flux to the terminals.
- · After soldering the terminals of an A3A, do not wash the A3A with any solvent.
- When mounting an A3A to a PCB and soldering the terminals of the A3A to the PCB, make sure that the flux will not rise above the surface of the PCB.

Operating Environment

• When using an A3A, make sure that dust, metal powder, or oil will not penetrate into the interior of the A3A.

LED

- · The polarity of the LED is indicated on the back of the Switch. Wire the LED correctly according to the polarity.
- · An A3A with a built-in LED does not have a limiting resistor. Connect a limiting resistor.
- The resistance can be calculated by using the following expression.

$$\label{eq:relation} \begin{array}{c} \mathsf{E}: \mbox{ Applied } \\ \mbox{ voltage (V) } \\ \mathsf{V}_{\mathsf{F}}: \mbox{ LED forward } \\ \mbox{ voltage (V) } \\ \mathsf{I}_{\mathsf{F}}: \mbox{ LED forward } \\ \mbox{ current (A) } \end{array}$$

Note: Make sure that the limiting resistor connected to the built-in LED of an A3A satisfies the characteristics of the built-in LED The mean forward current of the built-in LED must be 8 mA minimum.

Example

Conditions: Red LED with an IF of -10 mA at 24 V and a Ta of 25°C. From the red LED characteristic below,

VF will be 2 V when IF is 10 mA.

Therefore, R = (24 V - 2 V)/0.01 A =2.200 Ω.

- Thus the recommended resistance is 2.2 kΩ at 0.5 W (2* x I⊧²R).
- Note: A factor of 2 (marked with an asterisk) is applied because the permissible wattage of the resistor must be twice as large as the required wattage.

LED Characteristics

- (VF IF Characteristics)
- Ta: Ambient Temperature

(Red) 50



Ta = 25°C





Pushbutton

· When exchanging the Pushbutton (except the ones for the mechanical indicator models) with a new one, pull out the Pushbutton from the Switch, holding the Pushbutton in the longitudinal direction. Do not remove the Pushbutton of the mechanical indicator model.

Engraving of Pushbutton

- Depth of engraving: 0.3 mm max. for illuminating pushbutton
- Since the Pushbutton is made of polycarbonate, use an alcohol-based paint when marking legend.

Pressing of Pushbutton

• Apply firm pressure to the Pushbutton when operating it. In doing so, however, do not apply a pressure greater than 11.8 N.

З

A

A 3 A

■Installation

Mounting and Replacing the Pushbutton

1. Mounting Direction for the Pushbutton and Switch	2. Removing the Pushbut	tton (Non-lighted Models Only)
 Insert the catches of the Pushbutton into the grooves of the Switch and push down on the Pushbutton until it is fixed securely to the Switch. With lighted models, the LED is built into the Switch and cannot be replaced. 	 To remove the Pushbutton, hold both the Pushbutton and the Switch on the longer sides and pull the Pushbutton away from the Switch. (If the catches on the Pushbutton are bent outwards, it may result in malfunction.) 	• When replacing the Pushbutton, if the cap is held on the sides with catches, internal components (e.g., plate) may come loose. Be sure to hold the Pushbutton by the sides without catches (i.e., the longer sides of the Switch) when removing.
Catches on the Pushbutton Grooves in the Switch LED terminals	Catch	

Mounting Switch on a Panel

1. Mount Leaf Spring	2. Mount Flange on Panel	3. Fit Flange with Switch	4. Removing Switch
Press the leaf spring into the fitted groove on the upper surface of the Switch. For an easier fitting, first fit one side of the leaf spring, then press the other side into the fitting groove. (It will be easier mounting the leaf spring of one side first, then mount the other side.) Leaf spring fitting groovies Switch	 Insert the flange from the front surface of the panel. Flange Panel Guide The flange has two opposing guides to facilitate its insertion into the panel cutout hole. Be sure the flange does not remain tilted with respect to the panel surface after being installed. Cross Section Flange Panel (t = 1 to 1.6 mm) 	• While holding the flange, insert the opposing supports into the gaps between the leaf spring and Switch on the longer sides of the housing, and fit the rectangular hole of the flange with the projections of the switch housing.	 Insert a small flat-bladed screwdriver or tweezers into the flange support exposed on the rear of the panel. Pry up on each side to pull out the Switch.
Note: Be sure to fit the leaf spring exactly into the groove, and do not allow it to slip out of the groove.	Note: The mounting direction of the flange determines the orientation of the Switch.	Note: Completely remove any burrs on the panel cutout surface; otherwise, the flange and Switch will not attach solidly.	Note: Do not pry up the flange support more than necessary or the switch holding portions may be damaged.

Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.
Consult your OMRON representative before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems or equipment that may have a serious influence on lives and property if used improperly. Make sure that the ratings and performance characteristics of the product provide a margin of safety for the system or equipment, and be sure to provide the system or equipment with double safety mechanisms.

Note: Do not use this document to operate the Unit.

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