

## Knob-type Selector Switch

A165S / W

### Mounting Aperture of 16 mm

- Modular construction
- Oil-resistant IP65 models
- UL and CSA approved, VDE pending
- Conforms to EN60947-5-1, IEC947-5-1
- Short mounting depth, less than 28.5 mm below panel
- Wide range of switching capacity from general to microload
- Lighted and non-lighted models
- 2 and 3-notch models
- Manual and automatic reset models



## Ordering Information

### Construction

#### Flange Shape

#### Protective Structure and Terminal Type

- **Protective Structure**  
Oil-resistant IP65
- **Terminal Type**  
Solder terminals  
(tab terminals #110)

#### Lamp

- LED
- Neon lamp

#### Available Colors

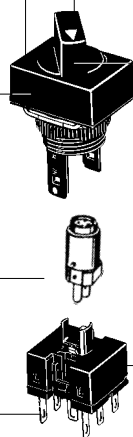
- For LED  
Red, green, yellow

#### Number of Notches and Reset Method

- **2 Notches**  
Manual reset  
Automatic reset
- **3 Notches**  
Manual reset  
Automatic reset

#### Switch Unit Specifications

- **General-purpose Loads**  
125 VAC: 5 A  
250 VAC: 3 A  
30 VDC 3 A  
Minimum applicable load: 1 mA at 5 VDC

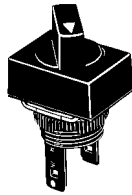


## ■ Model Number Legend

### 1. Selector

A165- -    

1    2   3   4



#### 1. Lighted/Non-lighted

S: Non-lighted  
W: Lighted

#### 2. Flange Shape

J: Rectangular  
A: Square  
T: Round

#### 3. Number of Notches/Reset Method

2M: 2 notches/Latching  
2A: 2 notches/Momentary  
3M: 3 notches/Latching  
3A: 3 notches/Momentary/Latching

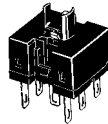
#### 4. Illumination Color

None: Non-lighted  
R: Red  
G: Green  
Y: Yellow

### 2. Switch (Common Use with Key-type Selector Switch)

A16S-     - 

1   2   3   4   5



#### 1. Number of Notches

2N: 2 notches  
3N: 3 notches

#### 2. Contacts

1: SPDT  
2: DPDT

#### 3. Lighted/Non-lighted

None: Non-lighted  
L: Lighted

#### 4. Terminals

None: Solder terminals (tab terminals #110)

#### 5. Transformer Circuit

None: Without transformer circuit  
T1: 100 VAC/110 VAC (Release: September 1999)  
T2: 200 VAC/220 VAC (Release: September 1999)

### 3. Lamp

A16-  

1   2



#### 1. Operating Voltage (Rated Voltage)

##### LED

5D: 5 VDC (5 VDC)  
12D: 12 VDC (12 VDC)  
24D: 24 VDC (24 VDC)

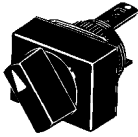


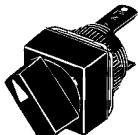





##### Neon Lamp

1N: 100 VAC 110 VAC  
2N: 200 VAC (220 VAC)

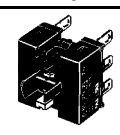
#### 2. Illumination Color

None: Incandescent Lamp  
R: Red (LED)  
G: Green (LED)  
Y: Yellow (LED)  
RN: Red (Neon Lamp)  
GN: Green (Neon Lamp)

## Functional Units


Shape	Number of notches	Reset method	Illumination	Rated voltage	Model	Functional unit color code
<b>Rectangular (A165□-J)</b> 	2 notches	Latching	LED	24 VDC	A165W-J2M□	R (red), Y (yellow), G (green)
			Non-lighted	---	A165S-J2M	
		Momentary 	LED	24 VDC	A165W-J2A□	
			Non-lighted	---	A165S-J2A	
	3 notches	Latching	LED	24 VDC	A165W-J3M□	
			Non-lighted	---	A165S-J3M	
		Momentary 	LED	24 VDC	A165W-J3A□	
			Non-lighted	---	A165S-J3A	
<b>Square (A165□-A)</b> 	2 notches	Latching	LED	24 VDC	A165W-A2M□	R (red), Y (yellow), G (green)
			Non-lighted	---	A165S-A2M	
		Momentary 	LED	24 VDC	A165W-A2A□	
			Non-lighted	---	A165S-A2A	
	3 notches	Latching	LED	24 VDC	A165W-A3M□	
			Non-lighted	---	A165S-A3M	
		Momentary 	LED	24 VDC	A165W-A3A□	
			Non-lighted	---	A165S-A3A	
<b>Round (A165□-T)</b> 	2 notches	Latching	LED	24 VDC	A165W-T2M□	R (red), Y (yellow), G (green)
			Non-lighted	---	A165S-T2M	
		Momentary 	LED	24 VDC	A165W-T2A□	
			Non-lighted	---	A165S-T2A	
	3 notches	Latching	LED	24 VDC	A165W-T3M□	
			Non-lighted	---	A165S-T3M	
		Momentary 	LED	24 VDC	A165W-T3A□	
			Non-lighted	---	A165S-T3A	

## ■ Switch Units


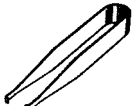
Shape	Classification					Model
	Lighted	Socket (without transformer circuit)	2 notches	SPDT	Solder terminal	A16S-2N1L
				DPDT		A16S-2N2L
			3 notches	DPDT		A16S-3N2L
	Non-lighted			2 notches		SPDT
			DPDT			A16S-2N2
			3 notches	DPDT		A16S-3N2

## Accessories (Order Separately)

## ■ Accessories

Name	Shape	Classification	Model	Remarks
Panel Plugs		Rectangular	A3BJ-3003	Used for covering the panel cutouts for future panel expansion.
		Square	A3BA-3003	
		Round	A3BT-3003	

## ■ Tools

Name	Shape	Model	Applicable types					Remarks
			Pushbut- ton Switch	Knob- type Selector Switch	Key-type Selector Switch	Emer- gency Stop Switch	Indicator	
Screw Fitting		A3B-3004	Yes	Yes	Yes	Yes	Yes	Convenient for ganged installation. Tighten to a torque of 0.39 N • m (5 kgf • cm) min.
Extractor		A16Z-5080	Yes	Yes	Yes	Yes	Yes	Convenient for extracting the Switch Unit and Lamps.

## Specifications

### ■ Approved Standards

UL, cUL (File No. E41515)

5 A at 125 VAC, 3 A at 250 VAC (general use)

3 A at 30 VDC (resistive)

EN60947-5-1 (Low Voltage Directive)

### ■ Ratings

AC resistive load (AC15)	DC resistive load (DC13)
3 A, 250 VAC 5 A, 125 VAC	3 A, 30 VDC

Minimum applicable load: 1 mA at 5 VDC

Rated values are obtained from tests conducted under the following conditions according to JIS C4505 and C4520.

1. Load: Resistive load
2. Mounting conditions: No vibration and no shock
3. Temperature: 20°±2°C
4. Operating frequency: 20 times/min

### Contact

Name	Contact
SPDT	

### LED

Rated voltage	Rated current	Operating voltage	Internal limiting resistor
5 VDC	30 mA	5 VDC±5%	33 Ω
12 VDC	15 mA	12 VDC±5%	270 Ω
24 VDC	10 mA	24 VDC±5%	1600 Ω

### ■ Characteristics

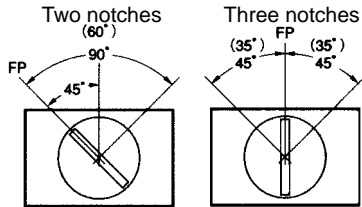
Item		Knob-type Selector Switch
Allowable operating frequency	Mechanical	20 operations/min max.
	Electrical	10 operations/min max.
Insulation resistance		100 MΩ min. (at 500 VDC)
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between terminals of same polarity 2,000 VAC, 50/60 Hz for 1 min between terminals of different polarity and also between each terminal and ground 1,000 VAC, 50/60 Hz for 1 min between lamp terminals (see note 2)
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude (malfunction within 1 ms)
Shock resistance	Mechanical	500 m/s <sup>2</sup> (50G)
	Malfunction	150 m/s <sup>2</sup> (15G) max. (malfunction within 1 ms)
Life expectancy	Mechanical	250,000 operations min.
	Electrical	100,000 operations min.
Ambient temperature		Operating: -10°C to 55°C (with no icing or condensation) Storage: -25°C to 65°C (with no icing or condensation)
Ambient humidity		Operating: 35% to 85%
Electric shock protection class		Class II
PTI (tracking characteristic)		175
Degree of contamination		3 (IEC947-5-1)
Weight		Approx. 13 g (in the case of a lighted DPDT switch)

**Note:** 1. Set and reset constitute one operation.  
2. With LED and incandescent lamp not mounted.

### ■ Operating Characteristics

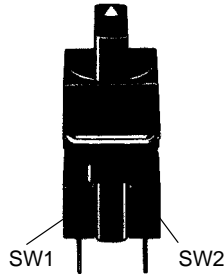
Features	Type	Knob-type Selector Switch	
		2 notches	3 notches
Operating force (OF) max.		0.1 N • m (1,000 gf • cm)	
Set position (SP)		90±5°	45 <sup>+10°</sup> <sub>0</sub>

### ■ Operation Angle



**Note:** The angle used for automatic reset is shown in parentheses.

### ■ Contacts



Notch	Contact				
	SPDT		DPDT		
	Position	SW	Position	SW1	SW2
2 notches					
3 notches	---				

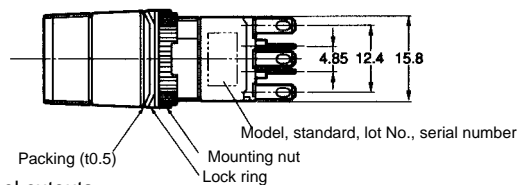
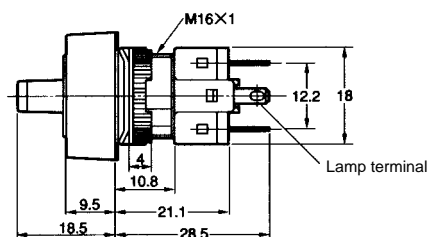
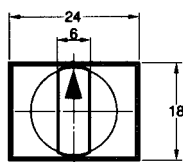
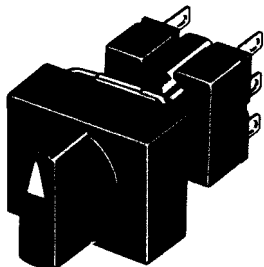
## Dimensions

**Note:** All units are in millimeters unless otherwise indicated.

### ■ Knob-type Selector Switches without Transformer

#### Rectangular A165□-J

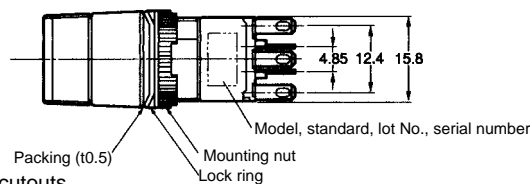
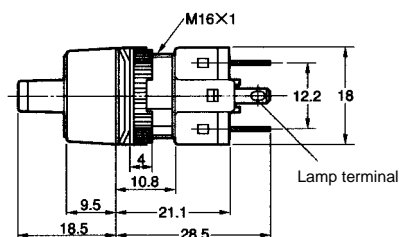
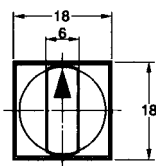
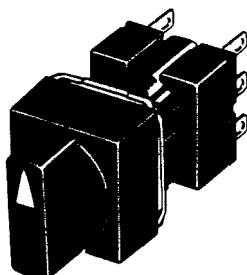
Solder terminals



**Note:** See page 31 for panel cutouts.

#### Square A165□-A

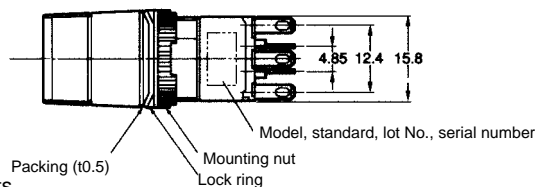
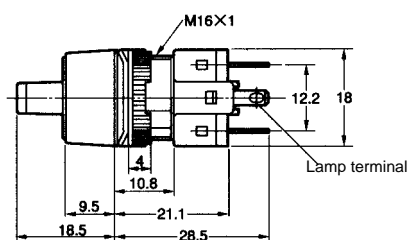
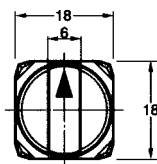
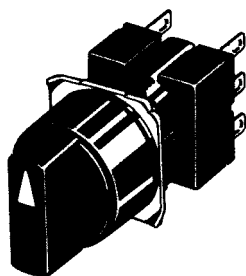
Solder terminals



**Note:** See page 31 for panel cutouts.

#### Round A165□-T

Solder terminals

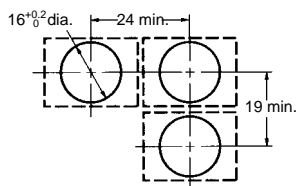


**Note:** See page 31 for panel cutouts.

## ■ Panel Cutouts

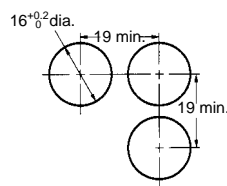
### Rectangular A165□-J

(Top View)



### Square A165□-A Round A165□-T

(Top View)



- Note:**
1. Make sure the thickness of the mounting panel is between 0.5 and 3.2 mm. If, however, a Switch Guard or Dust Cover is used, the thickness of the mounting panel must be between 0.5 and 2 mm.
  2. If the panel is to be finished with coating, etc., make sure that the panel meets the specified dimensions after coating.

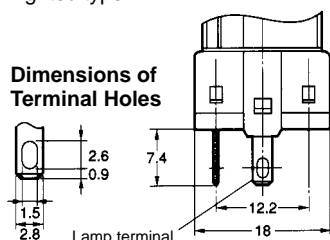
## ■ Terminal Arrangement

### Without Transformer

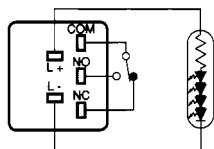
Lamp terminals are not provided with the Non-lighted Knob-type Selector Switches and Key-type Selector Switches.

#### SPDT Switches

Lighted type



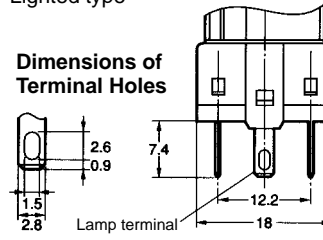
#### Terminal Arrangement (Bottom View)



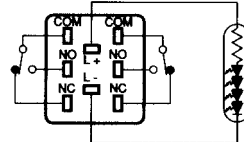
**Note:** The L+ is not shown on the Switch Unit.

#### DPDT Switches

Lighted type



#### Terminal Arrangement (Bottom View)



**Note:** The L+ is not shown on the Switch Unit.

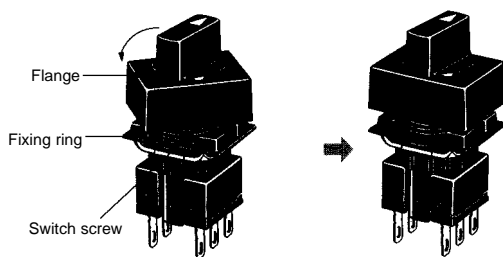
## Installation

For details on mounting the Switch to a panel, and mounting and dismantling the Switch Unit, refer to installation details for the A16 Pushbutton Switch.

### Flange Rotation

#### A165 Knob-type Selector Switch

Fix the Switch screw and rotate the flange in 45° turns.



**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.