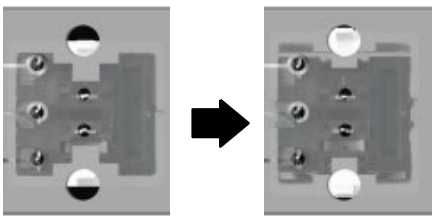
Pushbutton Switch
A16□-P

Pushbutton Switch with 16 mm Diameter Greatly Improves Operating Efficiency

- Achieves large reduction in wiring work by placing operating switches on boards.
- Helps standardize operating sections and helps prevent wiring errors.
- Enables many combinations of operating parts with the extensive A16 Series lineup.

- Easily mounts to panel and PCB. Separable type greatly reduces time taken for construction.

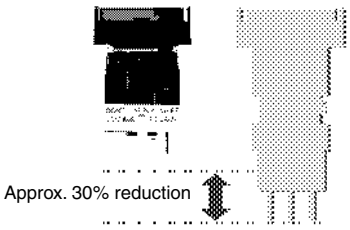
- Hold status can be easily checked from the rear side of PCB.



Locked Released

- Socket can be easily mounted and removed using the lever.

- Width of the separable type reduced to 28.3 mm. Panel width can also be reduced.



Ordering Information

■ List of Models

Switches with PCB Terminals, IP40

Contacts	Illumination	Voltage	Momentary operation (self-resetting) (see note 1)	Pushbutton color code	Alternate operation (self-holding) (see note 1)	Pushbutton color code
SPDT	LED	5 VDC	A16L-□□M-5D-1P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white)	A16L-□□A-5D-1P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white)
		12 VDC	A16L-□□M-12D-1P		A16L-□□A-12D-1P	
		24 VDC	A16L-□□M-24D-1P		A16L-□□A-24D-1P	
	Incandescent lamp	5 VAC/VDC	A16L-□□M-5-1P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white), B (black) (see note 2)	A16L-□□A-5-1P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white), B (black) (see note 2)
		12 VAC/VDC	A16L-□□M-12-1P		A16L-□□A-12-1P	
		24 VAC/VDC	A16L-□□M-24-1P		A16L-□□A-24-1P	
	None		A16-□□M-1P		A16-□□A-1P	
DPDT	LED	5 VDC	A16L-□□M-5D-2P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white)	A16L-□□A-5D-2P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white)
		12 VDC	A16L-□□M-12D-2P		A16L-□□A-12D-2P	
		24 VDC	A16L-□□M-24D-2P		A16L-□□A-24D-2P	
	Incandescent lamp	5 VAC/VDC	A16L-□□M-5-2P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white), B (black) (see note 2)	A16L-□□A-5-2P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white), B (black) (see note 2)
		12 VAC/VDC	A16L-□□M-12-2P		A16L-□□A-12-2P	
		24 VAC/VDC	A16L-□□M-24-2P		A16L-□□A-24-2P	
	None		A16-□□M-2P		A16-□□A-2P	

Note: 1. The first box in the model numbers is replaced with one of the following codes to indicate the shape of the Pushbutton: J: Rectangular, A: Square, or T: Circular. The second box is replaced with the Pushbutton color code.

2. Models with B (black) Pushbuttons are available only without illumination.

Switches with PCB Terminals, IP65

Contacts	Illumination	Voltage	Momentary operation (self-resetting) (see note 1)	Pushbutton color code	Alternate operation (self-holding) (see note 1)	Pushbutton color code
SPDT	LED	5 VDC	A165L-□□M-5D-1P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white)	A165L-□□A-5D-1P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white)
		12 VDC	A165L-□□M-12D-1P		A165L-□□A-12D-1P	
		24 VDC	A165L-□□M-24D-1P		A165L-□□A-24D-1P	
	Incandescent lamp	5 VAC/VDC	A165L-□□M-5-1P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white), B (black) (see note 2)	A165L-□□A-5-1P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white), B (black) (see note 2)
		12 VAC/VDC	A165L-□□M-12-1P		A165L-□□A-12-1P	
		24 VAC/VDC	A165L-□□M-24-1P		A165L-□□A-24-1P	
	None		A165-□□M-1P		A165-□□A-1P	
DPDT	LED	5 VDC	A165L-□□M-5D-2P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white)	A165L-□□A-5D-2P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white)
		12 VDC	A165L-□□M-12D-2P		A165L-□□A-12D-2P	
		24 VDC	A165L-□□M-24D-2P		A165L-□□A-24D-2P	
	Incandescent lamp	5 VAC/VDC	A165L-□□M-5-2P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white), B (black) (see note 2)	A165L-□□A-5-2P	R (red), Y (yellow), PY (pure yellow), G (green), A (blue), W (white), B (black) (see note 2)
		12 VAC/VDC	A165L-□□M-12-2P		A165L-□□A-12-2P	
		24 VAC/VDC	A165L-□□M-24-2P		A165L-□□A-24-2P	
	None		A165-□□M-2P		A165-□□A-2P	

Note: 1. The first box in the model numbers is replaced with one of the following codes to indicate the shape of the Pushbutton: J: Rectangular, A: Square, or T: Circular. The second box is replaced with the Pushbutton color code.

2. Models with B (black) Pushbuttons are available only without illumination.

Selector Switches with PCB Terminals, IP65

No. of notches	Contacts	Reset method	Illumination	Rated voltage	Model (see note 1)	Pushbutton color code
2 notches	SPDT	Manual	LED	24 VDC	A165W-□2M□-24D-1P	R (red), Y (yellow), G (green), B (black) (see note 2)
			None	---	A165S-□2M-1P	
		Automatic	LED	24 VDC	A165W-□2A□-24D-1P	R (red), Y (yellow), G (green), B (black) (see note 2)
			None	---	A165S-□2A-1P	
	DPDT	Manual	LED	24 VDC	A165W-□2M□-24D-2P	R (red), Y (yellow), G (green), B (black) (see note 2)
			None	---	A165S-□2M-2P	
		Automatic	LED	24 VDC	A165W-□2A□-24D-2P	R (red), Y (yellow), G (green), B (black) (see note 2)
			None	---	A165S-□2A-2P	

Note: 1. The first box in the model numbers is replaced with one of the following codes to indicate the shape of the Pushbutton: J: Rectangular, A: Square, or T: Circular. The second box is replaced with the Pushbutton color code.

2. Models with B (black) Pushbuttons are available only without illumination.

Key Selector Switches with PCB Terminals

No. of notches	Contacts	Reset method	Direction in which key can be removed	Model (see note)
2 notches	SPDT	Manual	Left	A165K-□2ML-1P
			Right	A165K-□2MR-1P
			Left and right	A165K-□2M-1P
		Automatic	Left	A165K-□2AL-1P
	DPDT	Manual	Left	A165K-□2ML-2P
			Right	A165K-□2MR-2P
			Left and right	A165K-□2M-2P
		Automatic	Left	A165K-□2AL-2P

Note: The first box in the model numbers is replaced with one of the following codes to indicate the shape of the Pushbutton: J: Rectangular, A: Square, or T: Circular.

Specifications

■ Approved Standards

Agency	Standards	File No.
UL, cUL (See note.)	UL508	E41515
---	EN60947-5-1	---

Note: cUL: CSA, C22.2 No. 14

■ Approved Standard Ratings

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)

3 A at 250 VAC (AC12), 3 A at 30 VDC (DC12)

■ Ratings

Contacts

AC resistive load	DC resistive load
3 A at 250 VAC 5 A at 125 VAC	3 A at 30 VDC

Minimum applicable load: 1 mA at 5 VDC
Rated values are obtained from tests conducted under the following conditions.

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

Super-bright LED

Rated voltage	Rated current	Operating voltage	Internal limiting resistor
5 VDC	30 mA (15 mA)	5 VDC±5%	33 Ω (68 Ω)
12 VDC	15 mA	12 VDC±5%	270 Ω (560 Ω)
24 VDC	10 mA	24 VDC±5%	1600 Ω (2,000 Ω)

Note: The values in parentheses are for models with blue Pushbuttons.

Incandescent Lamp

Rated voltage	Rated current	Operating voltage
6 VAC/VDC	60 mA	5 VAC/VDC
14 VAC/VDC	40 mA	12 VAC/VDC
28 VAC/VDC	24 mA	24 VAC/VDC

■ Characteristics

Item		Pushbutton Switch
Allowable operating frequency	**Mechanical**	Momentary operation: 120 operations/minute max. Alternate operation: 60 operations/minute max. (see note 1)
	Electrical	20 operations/minute 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^2
	Malfunction	150 m/s^2 max. (malfunction within 1 ms)
Durability	**Mechanical**	Momentary operation: 2,000,000 operations min. Alternate operation: 200,000 operations min.
	Electrical	100,000 operations min.
Electric shock protection class		Class II
PTI (proof tracking index)		175
Degree of contamination		3 (IEC947-5-1)
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%
Weight		Approx. 10 g (in the case of a lighted DPDT switch with solder terminals)

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

Precautions

Refer to the *Technical Information for Pushbutton Switches* (Cat. No. A143) and the *Precautions* section for the A16.

⚠ WARNING

Never wire the Switch while power is being supplied.
Never touch live terminals.
Failure to observe these warnings may cause electric shock.

■ Correct Use

Mounting

Always make sure that the power is turned OFF before mounting, removing, or wiring the Switch, or performing maintenance.

Do not tighten the mounting nut more than necessary using tools such as pointed-nose pliers. Doing so will damage the mounting nut. The tightening torque is 0.20 to 0.39 N·m.

Wiring

Solder terminals and quick-connect terminals (#110) are commonly used for terminals.

Be sure to use electrical wires that are a size appropriate for the applied voltage and carry current (conductor size is 0.5 to 0.75 mm^2). Perform soldering according to the conditions provided below. If the soldering is not properly performed, the lead wires will become detached, resulting in short-circuits.

1. Hand soldering: 30 W, within 5 s

2. Dip soldering: 240°C, within 3 s

Wait for one minute after soldering before exerting any external force on the solder.

Use non-corrosive resin fluid as the flux.

Make sure that the electric cord is wired so that it does not touch the Unit. If the electric cord will touch the Unit, then electric wires with a heat resistance of 100°C min. must be used.

After wiring the Switch, maintain an appropriate clearance and creepage distance.

Operating Environment

The IP65 model is designed with a degree of protection so that it will not sustain damage if it is subjected to water from any direction to the front of the panel.

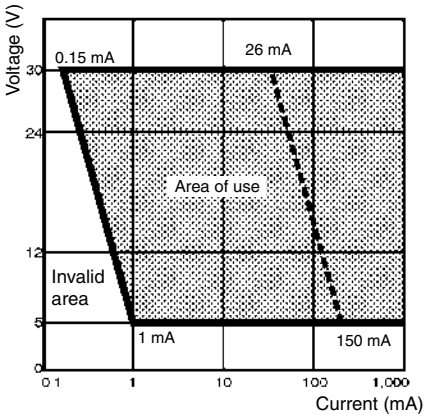
Using the Microload

Insert a contact protection circuit, if necessary, to prevent the reduction of life expectancy due to extreme wear on the contacts caused by loads where inrush current occurs when the contact is opened and closed.

The A16 allows both a standard load (125 V at 5A, 250 V at 3 A) and a microload. If a standard load is applied, however, the microload area cannot be used. If the microload area is used with a standard load, the contact surface will become rough, and the opening and closing of the contact for a microload may become unreliable.

The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% (λ 60) (conforming to JIS C5003).

The equation, λ 60 = 0.5 x 10^{-4}/operations indicates that the estimated malfunction rate is less than 1/2,000,000 operations with a reliability level of 60%.



Others

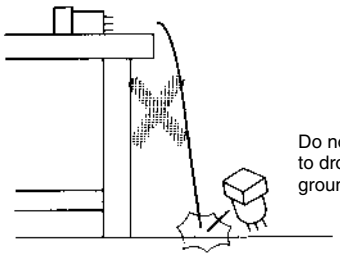
The oil-resistant IP65 uses NBR rubber and is resistant to general cutting oil and cooling oil. Some particular oils cannot be used with the oil-resistant IP65, however, so contact your OMRON representative for details.

If the panel is to be finished with coating, etc., make sure that the panel meets the specified dimensions after the coating.

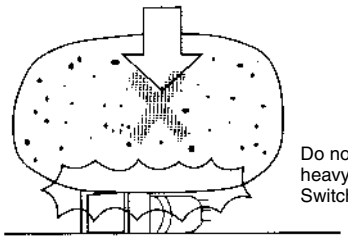
Do not subject the Switch to extreme shock or vibration. Doing so will cause malfunctions and damage to the Switch.

Do not let sharp objects come into contact with the Switches that are made of resin. Doing so will damage the Switches, causing scratches on the outside of the Pushbuttons, and malfunction.

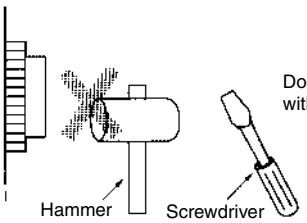
When handling the Switches, do not throw or drop them.



Do not allow the Switch to drop and hit the ground.



Do not place or drop heavy objects on the Switch.



Do not operate the Switch with hard or sharp objects.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. A116-E1-03