# A165K

CSM\_A165K\_DS\_E\_3\_4

# **Separate Construction with Cylindrical** 16-dia. Body

- Short mounting depth, less than 28.5 mm below panel
- Wide range of switching capacity from standard to microload
- Oil-resistant IP65 models





Refer to Safety Precautions for All Pushbutton Switches/ Indicators and Safety Precautions on page 11.

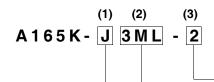
### **List of Models**

		Model	
	Rectangular	Square	Round
Solder terminals	A165K-J Series	A165K-A Series	A165K-T Series
Screw- less clamp connector	A165K-J Series	A165K-A Series	A165K-T Series

# **Model Number Structure**

Model Number Legend ...... The model numbers used to order sets of Units are illustrated below. One set comprises the Selector, Switch, and 2 Keys.

For information on combinations, refer to Ordering Information on page 2.



# (1) Shape of Selector

	Symbol	Shape	Color
	J	Rectangular	
	Α	Square	Black
•	Т	Round	

#### (2) Number of Notches/Resetting Method

Symbol	No. of notches	Reset method	Key release position
2ML			Left
2MR	2 notches	Manual	Right
2M	2 110101165		Left and right
2AL		Automatic	Left
ЗМС			Center
3MR			Right
3ML	3 notches	Manual	Left
ЗМ			Left, right, and center
3AC	3 notches	Automatic	Center

### (3) Contact Configuration

Symbol	Type	Terminal
1	SPDT	Solder Terminal
2	DPDT	Solder Terminal
2S	DPDT	Screw-less Clamp

Note: Only DPDT contacts are available with 3-notch models.

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Ordering as a Set ...... The model numbers used to order sets of Units are given in the following tables. One set comprises the Selector, Switch and 2 Keys.

A165K-A3MC-2

A165K-A3MR-2

A165K-A3ML-2

A165K-A3M-2

#### **Solder Terminals**

Rectangular Models

Oil-resistant IP65



A165K-J

Number of notches	Output	Reset metho	od	Key release position	Model
2 notches				Left	A165K-J2ML-1
	SPDT	Manual	$\checkmark$	Right	A165K-J2MR-1
	SPDT			Left and right	A165K-J2M-1
		Automatic	$\Diamond$	Left	A165K-J2AL-1
	DPDT		<u> </u>	Left	A165K-J2ML-2
		Manual		Right	A165K-J2MR-2
				Left and right	A165K-J2M-2
		Automatic	$\Diamond$	Left	A165K-J2AL-2
3 notches			<b>\</b>	Center	A165K-J3MC-2
	DPDT	Manual		Right	A165K-J3MR-2
	וטרטו	Manuai		Left	A165K-J3ML-2
				Left, right, and center	A165K-J3M-2

Square Models



Oil-resistant IP65

Number of notches	Output	Reset meth	od	Key release position	Model
				Left	A165K-A2ML-1
	SPDT	Manual	$\checkmark$	Right	A165K-A2MR-1
	SFDT			Left and right	A165K-A2M-1
2 notches		Automatic	$\Diamond$	Left	A165K-A2AL-1
2 Holdries				Left	A165K-A2ML-2
	DPDT	Manual	$\vee$	Right	A165K-A2MR-2
	DPD1			Left and right	A165K-A2M-2
		Automatic	$\Diamond$	Left	A165K-A2AL-2

Center

Right

Left, right, and center

Left

A165K-A

Round Models

DPDT

3 notches



Manual

A165K-T

Oil-resistant IP65

Number of notches	Output	Reset method	Key release position	Model
			Left	A165K-T2ML-1
	SPDT	Manual	Right	A165K-T2MR-1
	3501		Left and right	A165K-T2M-1
2 notches		Automatic 🔷	Left	A165K-T2AL-1
2 notches			Left	A165K-T2ML-2
	DPDT	Manual	Right	A165K-T2MR-2
	DPD1		Left and right	A165K-T2M-2
		Automatic 🔷	Left	A165K-T2AL-2
			Center	A165K-T3MC-2
3 notches	DPDT	Manual	Right	A165K-T3MR-2
3 HOICHES	DEDI	ivialiual	Left	A165K-T3ML-2
			Left, right, and center	A165K-T3M-2

Ordering as a Set ......The model numbers used to order sets of Units are given in the following tables. One set comprises the Selector, Switch and 2 Keys.

#### Screw-less clamp connector

Rectangular Models

Oil-resistant IP65



Number of notches	Output	Reset metho	od	Key release position	Model
				Left	A165K-J2ML-2S
2 notches	DPDT	Manual	$\checkmark$	Right	A165K-J2MR-2S
2 notches	DPD1		Ī	Left and right	A165K-J2M-2S
		Automatic	$\Diamond$	Left	A165K-J2AL-2S
				Center	A165K-J3MC-2S
3 notches	DPDT	Manual	, 1	Left	A165K-J3ML-2S
	וטייט		$\vee$	Right	A165K-J3MR-2S
				Left, right, and center	A165K-J3M-2S

Square Models

Oil-resistant IP65



Number of notches	Output	Reset method	Key release position	Model
2 notches			Left	A165K-A2ML-2S
	DPDT	Manual	Right	A165K-A2MR-2S
			Left and right	A165K-A2M-2S
		Automatic 🔷	Left	A165K-A2AL-2S
	DPDT		Center	A165K-A3MC-2S
3 notches		Manual	Right	A165K-A3MR-2S
		Manual	Left	A165K-A3ML-2S
			Left, right, and center	A165K-A3M-2S

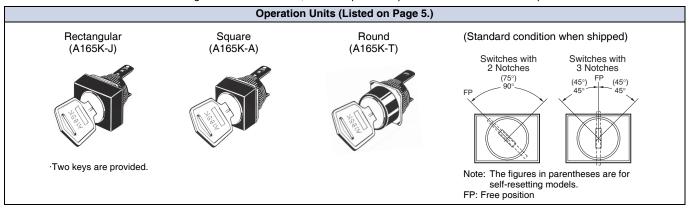
Round Models

Oil-resistant IP65

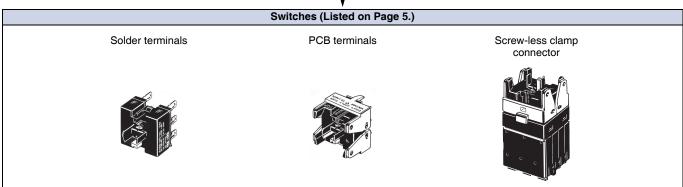


Number of notches	Output	Reset method	Key release position	Model
			Left	A165K-T2ML-2S
2 notches	DPDT	Manual	Right	A165K-T2MR-2S
2 HOLGHES	DFD1		Left and right	A165K-T2M-2S
		Automatic 🔷	Left	A165K-T2AL-2S
			Center	A165K-T3MC-2S
3 notches	DPDT	Manual	Left	A165K-T3ML-2S
3 Holdries	וטפט	Mariuai	Right	A165K-T3MR-2S
			Left, right, and center	A165K-T3M-2S

**Ordering Individually**....... Selectors and Switches can be ordered separately. Combinations that are not available as sets can be created using individual Units. Also, store the parts as spares for maintenance and repairs.







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Ordering Individually ....... Selectors and Switches can be ordered separately. Combinations that are not available as sets can be created using individual Units. Also, store the parts as spares for maintenance and repairs.

#### **Selectors**

Appearance	Number of notches	Reset method	Key release position	Model
Rectangular			$\bigcirc$	A165K-J2ML
(A165K-J)	2 notches	Manual	$\bigcirc$	A165K-J2MR
	2 Holdries		$\otimes$	A165K-J2M
		Automatic 🕥	$\bigcirc$	A165K-J2AL
Eller			1	A165K-J3MC
		Manual	Ø	A165K-J3MR
	3 notches	Manual	$\bigcirc$	A165K-J3ML
			*	A165K-J3M
		Automatic (i)	1	A165K-J3AC
Square			$\bigcirc$	A165K-A2ML
(A165K-A)	2 notches	Manual	Ø	A165K-A2MR
			$\otimes$	A165K-A2M
		Automatic 🕥	$\bigcirc$	A165K-A2AL
			1	A165K-A3MC
		Manual	Ø	A165K-A3MR
	3 notches		$\bigcirc$	A165K-A3ML
			*	A165K-A3M
		Automatic (i)	(1)	A165K-A3AC
Round			$\bigcirc$	A165K-T2ML
A165K-T)	0	Manual	Ø	A165K-T2MR
-	2 notches		⊗	A165K-T2M
		Automatic (	$\bigcirc$	A165K-T2AL
			(1)	A165K-T3MC
		NA I	Ø	A165K-T3MR
	3 notches	Manual	$\bigcirc$	A165K-T3ML
			*	A165K-T3M
		Automatic (i)	①	A165K-T3AC

### **Switches**

Appearance	Classification				
<b>~</b>		2 notches	SPDT		A16S-2N-1
		2 Holones	DPDT	Solder terminal	A16S-2N-2
	Switches	3 notches	DPDT		A16S-3N-2
		2 matches	SPDT	PCB terminal	A16S-2N-1P
		2 notches	DPDT	- PCB terminal	A16S-2N-2P

# **Switch Units with Screw-less Clamp Connectors**

Appearance	Classification				Model	Remarks
	Common to standard	DPDT	2 notches	Non lighted	A16-2S	Common to ones for pushbutton switches.
	load and microload.	DPD1	3 notches	- Non-lighted	A16S-3N-2LS	

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# Accessories and Tools (Order Separately)

#### **Accessories**

Name	Appearance	Classification	Model	Remarks	
Panel Plugs	42	Rectangular	A16ZJ-3003	Used for covering the pane cutouts for future panel	
		Square	A16ZA-3003	expansion.	
		Round	A16ZT-3003	Degree of protection: IP40 Color: Black	

#### **Tools**

	Appearance	Model	Applicable types					
Name			Pushbutton Switch	Knob-type Selector Switch	Key-type Selector Switch	Emergency Stop Switch	Indicator	Remarks
Screw Fitting	9	A16Z-3004	Yes	Yes	Yes	Yes	Yes	Convenient for ganged installation.
Extractor		A16Z-5080	Yes	Yes	Yes	Yes	Yes	Convenient for extracting the Lamp from a Solder-terminal Socket Unit.

# Key

Appearance	Model
	A165K-KEY

Note: Two Keys are provided.

Ordering as a Set: Refer to page 2 to 3.

<sup>■</sup> Specifications, and dimensions: Refer to page 7 to 10.

<sup>■</sup> Accessories, replacements, and tools: Refer to this page.

# **Specifications**

# **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)

Note: Certification has been obtained for the Switch Unit. For detailed information on individual products that have received certification, consult your supplier.

# TÜV (EN60947-5-1) (Low Voltage Directive)

3 A at 250 VAC 3 A at 30 VDC

# CCC (GB14048.5)

5 A at 125 VAC 3 A at 250 VAC 3 A at 30 VDC

# **Ratings**

# Contacts

Rated voltage	Resistive load
125 VAC	5 A
250 VAC	3 A
30 VDC	3 A

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 times/min

#### **Contact Form**

Name	Contact form
SPDT	COM NO

#### **Characteristics** Socket Units

Socket Un	ITS			
Item	Туре	Key-type Selector Switch		
Allowable	Mechanical	20 operations/minute max.		
operating frequency	Electrical	10 operations/minute max.		
Insulation resistance		100 MΩ min. (at 500 VDC)		
Contact resistance		100 mΩ max. (intial value)		
	Between terminals of same polarity	1,000 VAC, 50/60 Hz for 1 minute		
Dielectric strength	Between terminals of different polarity	2,000 VAC, 50/60 Hz for 1 minute		
	Between each ter- minal and ground	2,000 VAC, 50/60 Hz for 1 minute		
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude (malfunction within 1 ms)		
Shock	Destruction	500 m/s <sup>2</sup> max.		
resistance	Malfunction	150 m/s <sup>2</sup> max. (malfunction within 1 ms)		
Durability	Mechanical	250,000 operations min. (durability of key: 10,000 operations min.)		
	Electrical	100,000 operations min.		
Electric shoo	ck protection	Class II		
PTI (tracking	characteristic)	175		
Degree of co	ntamination	3 (IEC60947-5-1)		
Weight		Approx. 26.5 g (in the case of a DPDT switch key)		
Ambient operating temperature		−10°C to 55°C (with no icing or condensation)		
Ambient ope	rating humidity	35% to 85%RH		
Ambient storage temperature		−25°C to 65°C (with no icing or condensation)		

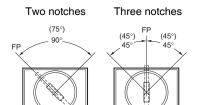
#### **Screw-less Clamp**

Item	Туре	Screw-less Clamp				
Recomme	nded wire size	0.5 mm <sup>2</sup> twisted wire or 0.8 mm-dia. solid wire				
Usable	Twisted wire	0.3 mm <sup>2</sup>	0.5 mm <sup>2</sup>	0.75 mm <sup>2</sup>	1.25 mm <sup>2</sup>	
wires and tensile	Solid wire	0.5 mm dia.	0.8 mm dia.	1.0 mm dia.		
strength	Tensile strength	10 N	20 N	30 N	40 N	
Length of	exposed wire	10 ±1 mm				
Complian	t standards	JIS C 2811 Terminal Blocks for Industrial Use				

# **Operating Characteristics**

Туре	Key-type Selector Switch			
Characteristics	2 notches	3 notches		
Operating torque (OF) max.	0.1 N·m			
Set position (SP)	90±5° 45°+10			

# **Operation Angle**



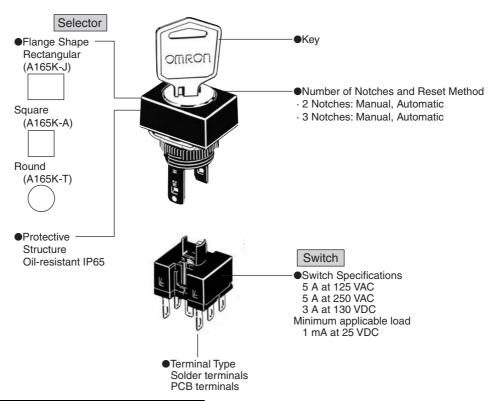
Note: The angle used for automatic reset is shown in parentheses. FP: Free position

#### **Contact Configuration**

	Contact configuration					
No. of	SPDT		DPDT			
notches	Posi- tion	sw	Posi- tion	SW2	SW1	
2	♦	•	$\odot$	••	•	
notches	$\bigcirc$	δ.	$\bigcirc$	δ.	<i>\$</i> •	
			$\odot$	• /	••	
3 notches			$\bigcirc$	••	••	
			$\bigcirc$	•	·•	



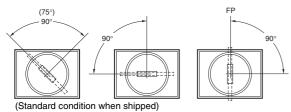
# **Model Structure**



# The flange can be rotated to easily change the operation angle of the knob.

For information on rotating the flange, refer to the A165S/W datasheet.

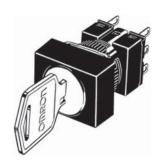
Example: Knob-type Selector Switch with Two Notches

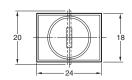


Note: The angle is 75° for self-resetting models.

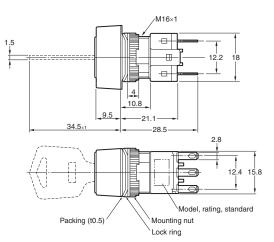
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# Rectangular A165K-J Solder terminals (tab terminals #110)



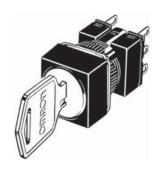


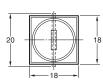


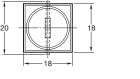


# Square A165K-A

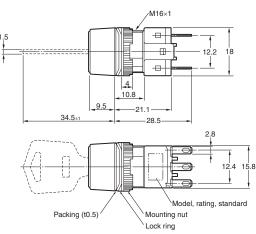
# Solder terminals (tab terminals #110)







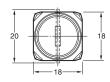
\* Refer to the A165S/W for Panel cutouts.

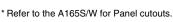


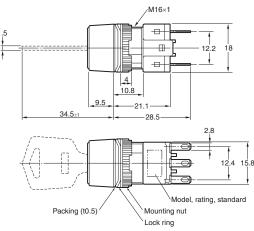
# Round A165K-T

# Solder terminals (tab terminals #110)

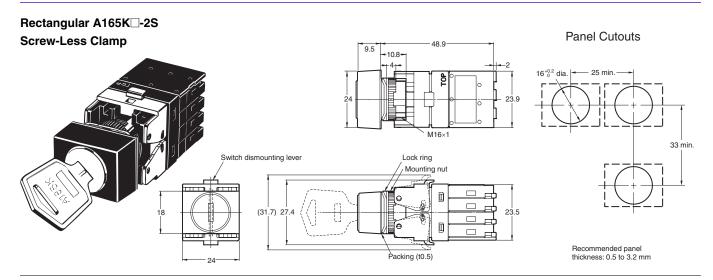








Dimensions • The Dimension shows 2-switch outputs. • The lamp terminal is also provided with non-lighted models. • A rectangular model is listed as an example. (Unit: mm)



# **Terminal Arrangement**

For information on the terminal arrangement, refer to the A165S/W datasheet.

# **Panel Mounting and Socket Unit Mounting and Removal**

Refer to the A16 Pushbutton Switch datasheet.

#### Flange Rotation

Refer to the A165S/W datasheet.

# **Safety Precautions**

#### Refer to Safety Precautions for All Pushbutton Switches/Indicators.

#### Precautions for 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 0.29 to 0.49 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 mm²). 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: 350°C, within 3 s
- Dip soldering: 350°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 touches 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.

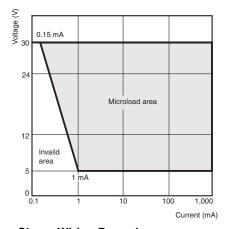
#### **Operating Environment**

 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,  $\lambda$  60 = 0.5 × 10<sup>-6</sup>/operations indicates that the estimated malfunction rate is less than 1/2,000,000 operations with a reliability level of 60%.



# **Screw-less Clamp Wiring Procedure**

# **Connecting Wires**

- 1. Strip the wires for 10 mm (allowable range:  $10\pm 1$  mm).
- 2. If braided wire is used, twist the wire to straighten it out.
- Insert the wire into the insertion hole while pressing the release button at the side of the hole. (Using a precision screwdriver is recommended.)
- 4. Let go of the release button to lock the wire into place.
- After locking, pull on the wire gently to confirm that it is securely locked

#### **Removing Wires**

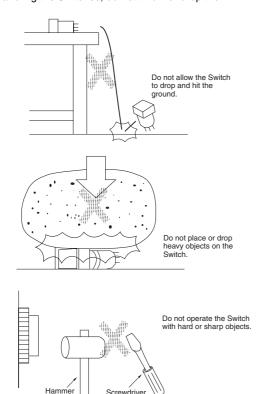
Remove wires by pulling them while pressing the release button.

Note: When reusing wires that have already been locked one, cut off the end of the wire and strip the wire again before using.

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#### **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 operating parts, and malfunction.
   When handling the Switches, do not throw or drop them.



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