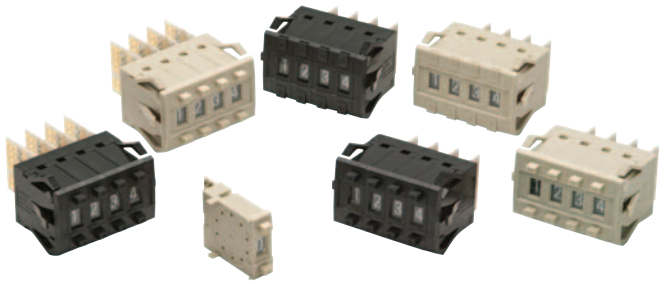
Thumbwheel Switch

A7BS/A7BL

CSM_A7BS/A7BL_DS_E_6_2

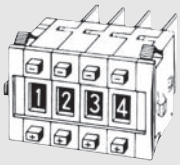
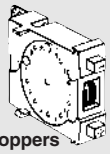
Wide Range of Locking-type Models Available

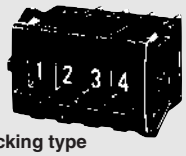
- Character height of 4.8 or 3.2 mm makes for easy-to-view display.
- Installation is easy with snap-in mounting.
- The series includes a complete range of locking-type models that prevent accidental operation.



Ordering Information

Switches (Single Switch Units)

Model	A7BS		A7BS-20□-S	
Classification (See note 1.)	Snap-in (front mounting) 		Snap-in (front mounting)  With external stoppers	
Character height	Decimal: 4.8 mm Hexadecimal: 3.2 mm		4.8 mm	
Terminals	Solder terminals *1			
Color	Light gray	Black	Light gray	Black
Output code number	Model			
06 (binary coded decimal)	A7BS-206 *2	A7BS-206-1 *2	A7BS-206-S	A7BS-206-S-1
07 (binary coded decimal, with component adding provision) *3	A7BS-207 *2	A7BS-207-1 *2	A7BS-207-S	A7BS-207-S-1
54 (binary coded hexadecimal)	A7BS-254	A7BS-254-1	---	---
55 (binary coded hexadecimal, with component-adding provision) *3	A7BS-255	A7BS-255-1	---	---

Model	A7BL	
Classification (See note 1.)	Snap-in (front mounting)  Locking type	
Character height	4.8 mm	
Terminals	Solder terminals *1	
Color	Light gray	Black
Output code number	Model	
06 (binary coded decimal)	A7BL-206 *2	A7BL-206-1 *2
07 (binary coded decimal, with component-adding provision) *3	A7BL-207 *2	A7BL-207-1 *2

Note: 1. The classification diagrams show 4 Switch Units combined with End Caps to create 4-digit displays.
2. The model numbers given above are for Switch Units.
3. Models with +, - displays can also be produced. Add "-PM" after the "206" or "207" in the model number (e.g., A7BS-206-PM or A7BS-207-PM-1).

*1. For models with PCB terminals, add "-P2" to the model number (e.g., A7BS-207-P2-1).

*2. Models with internal stoppers are also available. Add "-S□□" after the "206" or "207" in the model number and specify the display range in the □□. For example, to specify the range 0 to 6, add "-S06" to the model number (e.g., A7BS-206-S06-1).
For structural reasons, models with stoppers cannot be manufactured for the A7BS-254 and A7BS-255.

*3. Models with diodes are available. Add "-D" to the model number (e.g., A7BS-207-D or A7BS-207-D-1).

Accessories (Order Separately)

Use accessories, such as End Caps, Spacers, and Connectors with the Switch Units.

End Caps, Spare Units, and Connectors

Accessory	Color	Light gray	Black
End Caps (1 pair)		A7B-M	A7B-M-1
Spacer		A7B-P□ (See note.)	A7B-P□-1 (See note.)
Connectors	Solder terminals	A7B-C	
	PCB terminals	A7B-CP	

Note: The □ in the Spacer model number stands for a letter in the range A to U. (Refer to the table in the following explanation about Spacers.)

End Caps

End Caps are used on the Switch Units at each end and allow all the Switch Units to be securely mounted to a panel. They come in pairs, one for the left and one for the right.

Spacers

- Spacers are used for creating extra space or gaps between the Switch Units and have the same dimensions as the Switch Units themselves.
- There are also Spacers with engraved characters or symbols that can be used for indicating units, such as time and length. (Refer to the following table.) Consult your OMRON representative for details.

Symbol	A	B	C	D	E	F	G
Stamp	No designation	SEC	MIN	H	g	kg	mm

Symbol	H	J	K	L	Q	T	U
Stamp	cm	m	°C	PCS	x 10 SEC	0	•

Specifications

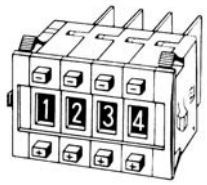
Switching capacity (resistive load)		3.3 to 28 VDC or 50 VAC 1 mA to 0.1 A
Continuous carry current		1 A max.
Contact resistance		300 mΩ max.
Insulation resistance	Between non-connected terminals	10 MΩ min. (at 500 VDC)
	Between terminal and non-current carrying part	1,000 MΩ min. (at 500 VDC)
Dielectric strength	Between non-connected terminals	600 VAC, 50/60 Hz for 1 min
	Between terminal and non-current carrying part	1,000 VAC, 50/60 Hz for 1 min
Vibration resistance		10 to 55 Hz, 1.5-mm double amplitude
Shock resistance		490 m/s² min.
Durability	Mechanical	100,000 operations min.
	Electrical	50,000 operations min.
Ambient temperature		Operating: -10°C to 65°C (with no icing) Storage: -20°C to 80°C
Ambient humidity		Operating: 45% to 85%
Max. operating force		5.39 N max.

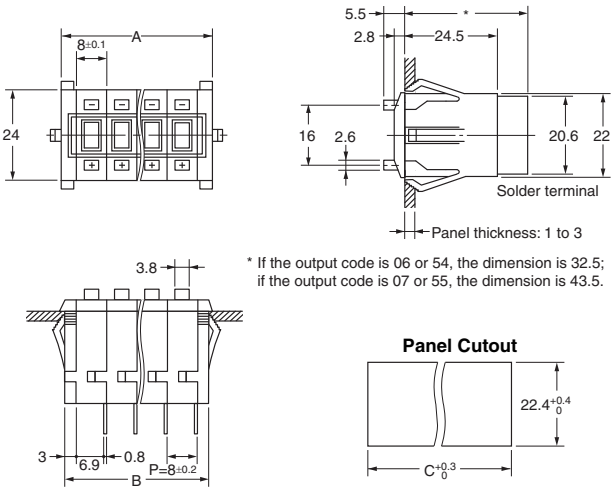
Dimensions

(Unit: mm)

Switches

A7BS-2□□(-1)
Solder Terminals





* If the output code is 06 or 54, the dimension is 32.5;
if the output code is 07 or 55, the dimension is 43.5.

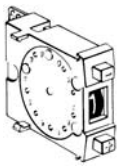
Number of Switches (n)	Size A (n x 8 + 8)	Size B (n x 8 + 6)	Size C
1	16	14	14.4
2	24	22	22.4
3	32	30	30.4
4	40	38	38.4
5	48	46	46.8
6	56	54	54.8
7	64	62	62.8
8	72	70	70.8
9	80	78	78.8
10	88	86	86.8

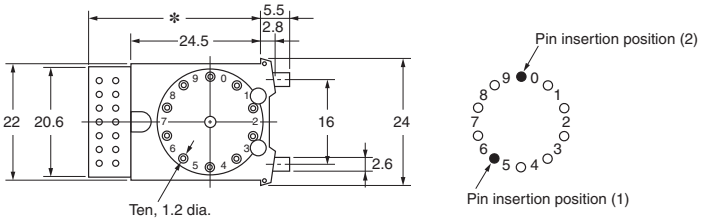
Note: 1. The dimensions above include both End Caps, and will increase 8 mm for each Spacer inserted.
2. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions. The tolerance for multiple connection is ±(number of units x 0.4) mm.

Thumbwheel Switches with External Stoppers:
A7BS-20□-S(-1)

- Use A7BS-S Stopper Pins to make dial display restrictions for these Switches.
- Insert the Stopper Pins in the positions required to give the desired display range. For example, for a display range of 0 to 5, insert a Stopper Pin at position 1 (see following diagram) to stop the display from going above 5 when the (+) button is pressed, and insert a Stopper Pin at position 2 to stop the display from going below 0 when the (-) button is pressed.

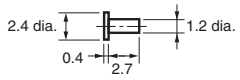
Refer to page 7 for details.





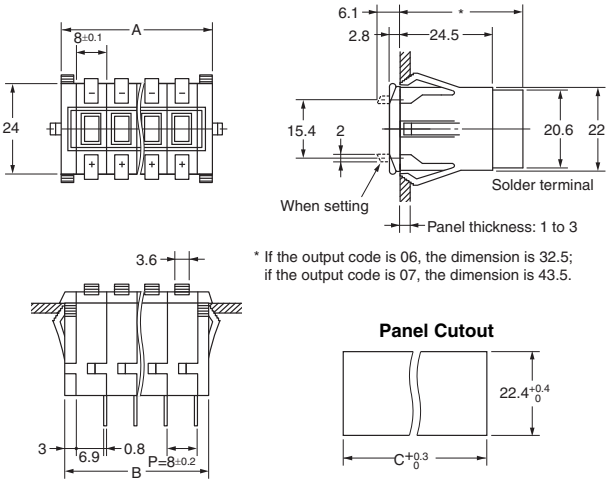
* If the output code is 06, the dimension is 32.5;
if the output code is 07, the dimension is 43.5.

Stopper Pins



Note: 1. Two pins constitute one set.
2. The first shipment is free and is attached to the Switch.
Order the A7BS-S separately if it is required for maintenance.

A7BL-206(-1)
A7BL-207(-1)
Solder Terminals, Locking Models



* If the output code is 06, the dimension is 32.5;
if the output code is 07, the dimension is 43.5.

Number of Switches (n)	Size A (n x 8 + 8)	Size B (n x 8 + 6)	Size C
1	16	14	14.4
2	24	22	22.4
3	32	30	30.4
4	40	38	38.4
5	48	46	46.8
6	56	54	54.8
7	64	62	62.8
8	72	70	70.8
9	80	78	78.8
10	88	86	86.8

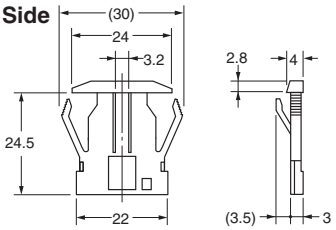
Note: 1. The dimensions above include both End Caps, and will increase 8 mm for each Spacer inserted.
2. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions. The tolerance for multiple connection is ±(number of units x 0.4) mm.

Accessories (Order Separately)

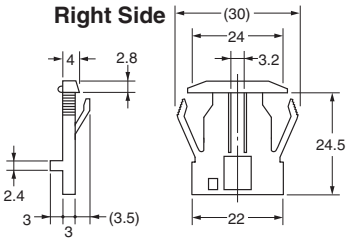
End Caps for Push-operated Switches

A7B-M(-1) Snap-in Panel Mounting

Left Side

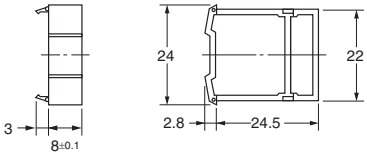


Right Side



Spacers for Push-operated Switches

A7B-P□(-1) Snap-in Panel Mounting

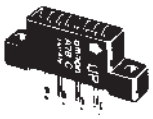


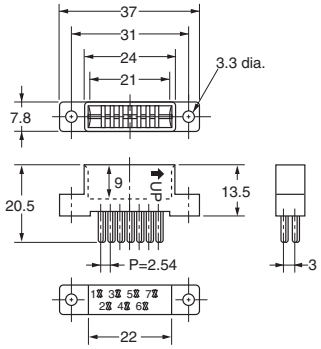
The □ in the Spacer model number stands for a letter in the range A to U. (Refer to the table under the explanation about Spacers on page 2.)

Note: Unless otherwise indicated, dimensional tolerances for dimensions in the models above are ± 0.4 mm.

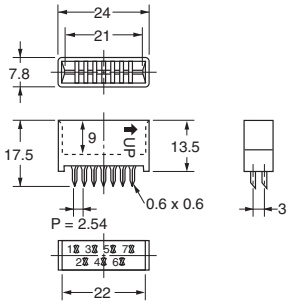
Connectors (These devices allow Switches to be quickly removed for maintenance and inspection of connectivity, and quickly re-installed.)

A7B-C
Solder Terminals

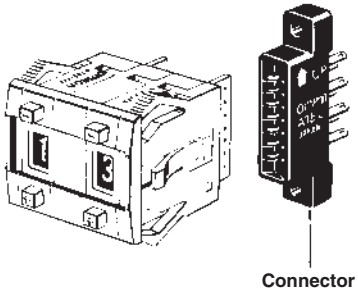




A7B-CP
PCB Terminals



Inserting Connectors
Insert Connectors with the “UP” arrow pointing up.

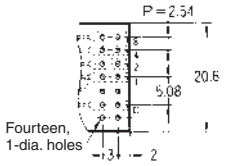
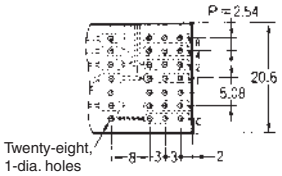


Note: Unless otherwise indicated, dimensional tolerances for dimensions in the models above are ± 0.4 mm.

Output Codes/Terminals

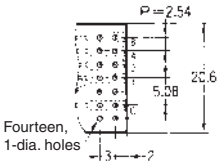
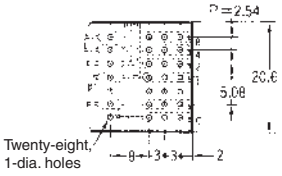
- Switches with output codes 06 or 07 both use binary coded decimal but Switches with output code 07 have a component-adding provision. Similarly, Switches with output codes 54 or 55 both use binary coded hexadecimal but Switches with output code 55 have a component-adding provision.

- How to Read Output Codes
  For example, when the dial position is “3,” the common terminal C on the Switch is connected to terminals 1 and 2. When the Switch is inserted into the Connector, the common terminal C becomes connector terminal 2, and terminals 1 and 2 become connector terminals 4 and 5 respectively.

Output code number	Terminals	Output codes
06		
07	 Component-adding provision	

Model	Switch Unit or Connector	Common terminal number	Terminals connected to common			
	Switch Unit	C	1	2	4	8
06	Connector	2	4	5	6	7
07	Connector	1	4	5	6	7
Dial	0					
	1		●			
	2			●		
	3		●	●		
	4				●	
	5		●		●	
	6			●	●	
	7		●	●	●	
	8					●
	9		●			●

Note: The solid dot ● indicates that the internal switch is ON (i.e., connected to the common terminal).

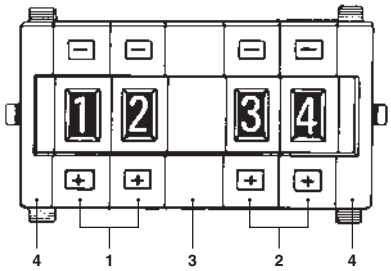
Output code number	Terminals	Output codes
54		
55	 Component-adding provision	

Model	Switch Unit or Connector	Common terminal number	Terminals connected to common			
	Switch Unit	C	1	2	4	8
54	Connector	2	4	5	6	7
55	Connector	1	4	5	6	7
Dial	0					
	1		●			
	2			●		
	3		●	●		
	4				●	
	5		●		●	
	6			●	●	
	7		●	●	●	
	8					●
	9		●			●
	A			●		●
	B		●	●		●
	C				●	●
	D		●		●	●
	E			●	●	●
	F		●	●	●	●

Note: 1. The solid dot ● indicates that the internal switch is ON (i.e., connected to the common terminal).

Ordering Procedure

Place orders as shown in the example below, specifying the model and number. Standard products are not factory-assembled for shipment. Contact your OMRON representative for details on ordering factory-assembled sets.



1. A7BS-206 (Switch Unit): 2 pieces
2. A7BS-207 (Switch Unit): 2 pieces
3. A7B-PA (Spacer): 1 piece
4. A7B-M (End Caps): 1 pair

Safety Precautions

Refer to *Precautions for Correct Use* on page in the *Technical Guide for Thumbwheel Switches*.

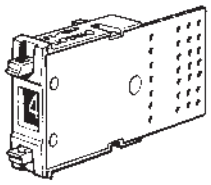
Precautions for Correct Use

Handling

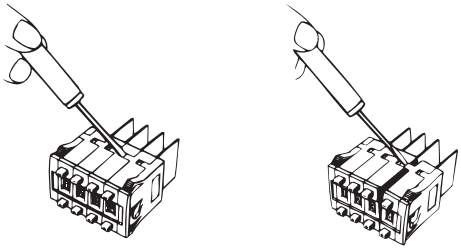
- The molded components of the Switch use polyacetal resin and ABS resin. It is recommended that alcohol is used to wipe off dirt and smudges from the molded components. Take care to prevent the alcohol from getting inside.
- A7BS/A7BL Thumbwheel Switches are not drip-proof. Do not use them in areas subject to water or oil.
- Do not allow solder flux or alcohol to enter the Switch.

Setting Numbers

Locking Type

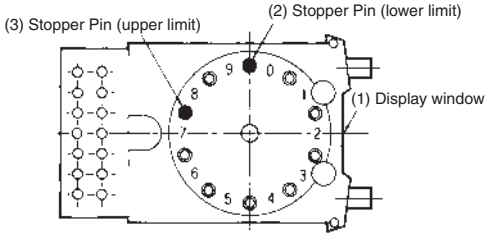


- Set with the setting button by raising it.
- Return the button to its original position after setting. It is then locked to prevent rotation, and the set numbers will not change accidentally.
- To separate the Switches, use a flat-blade screwdriver as shown in the following figure to release the hooks on the top and bottom and then separate the Switches. Be careful not to bend the hooks.



Models with External Stoppers (A7BS-20□-S)

With the A7BS-20□-S, any range can be set externally using the Stopper Pin. Insert the Stopper Pin using the following procedure:



Example: To Display the Range 0 to 7

1. Any number within the range of (0 to 7) can be chosen to limit the numbers displayed in the display window. (In this example, 8 and 9 are outside of this range.)
2. First, insert the Stopper Pin in the hole in front of the lower limit (“0”) for the number to be defined.
3. Next, inset the Stopper Pin in the hole past the upper limit (“7”) for the number to be defined. (The Stopper Pins then surround the exact range to be defined.)
4. Confirm that the (+) push-button can no longer be pushed after reaching the upper limit of (“7”).
5. Confirm that the (-) push-button can no longer be pushed after reaching the lower limit of (“0”). This completes the setting.

Terms and Conditions Agreement

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NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.
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