A22

Install in 22-dia. or 25-dia. Panel Cutout (When Using a Ring)

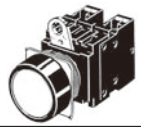
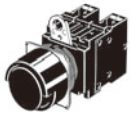


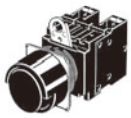
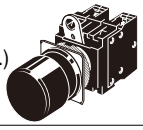
- Lever for easily mounting and removing the Switch Unit.
- Increase wiring efficiency with three-row mounting of Switch Blocks.
- Finger protection mechanism on Switch Unit provided as a standard feature.
- Use 25-dia. ring to install in 25-dia. panel cutouts.
- Mounted using either open-type (fork-type) or closed-type (round-type) crimp terminals.
- IP65 oil resistance (non-lighted models)
  IP65 (lighted models)

Be sure to read *Safety Precautions for All Pushbutton Switches* and *Safety Precautions* on page 23.

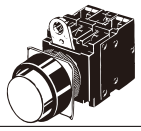
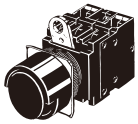
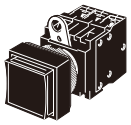
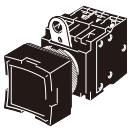
List of Models

Non-lighted Pushbutton Switches

	Appearance		Model number
Round	Flat		A22-F
	Projected		A22-T
	Full guard		A22-G
	Half guard		A22-H

	Appearance		Model number
Square	Projected		A22-C
	Guard		A22-D
Mushroom	Mushroom Small (30 dia.)		A22-S
	Mushroom Medium (40 dia.)		A22-M

Lighted Pushbutton Switches

	Appearance		Model number
Round	Projected		A22L-T
	Full guard		A22L-G
	Half guard		A22L-H
Square	Projected		A22L-C
	Full guard		A22L-D

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Model Number Structure

Model Number Legend ..... Shipped as a set which includes the Pushbutton, Lamp (lighted type only), and Switch.
For information on combinations, refer to *Ordering Information* on pages 3 to 6.

(1) (2) (3) (4) (5) (6)

A22 L - T R - 12A - 10 M

(1) Type

Code	Description
No symbol	Non-lighted
L	Lighted

(2) Flange Shape

Non-lighted

Code	Description	
F	Round	Flat
T		Projected
G		Full-guard
H		Half-guard
C	Square	Projected
D		Full-guard
S	Round	Mushroom Small (30 dia.)
M		Mushroom Medium (40 dia.)

Lighted

Code	Description	
T	Round	Projection
G		Full-guard
H		Half-guard
C	Square	Projection
D		Full-guard

(3) Illumination Color

Code	Description
R	Red
G	Green
Y	Yellow
W	White
A	Blue
B	Black*

* For non-lighted type only

(4) Light Source

Without Voltage Reduction Unit

Code	Operating Voltage	
No symbol	Non-lighted	
6D	LED	6 VDC
6A		6 VAC
12A		12 VAC/VDC
24A		24 VAC/VDC
5	Incandescent lamp	5 VAC/VDC
12		12 VAC/VDC
24		24 VAC/VDC

With Voltage Reduction Unit

Code	Operating Voltage	
T1	LED	100 VAC
T2		200 VAC

Note: LED incorporates the 24-VAC/VDC type.

(5) Contacts

Code	Description
10	SPST-NO
01	SPST-NC
11	SPST-NO + SPST-NC
20	DPST-NO
02	DPST-NC

Note: 1. The contact ratings are for standard loads. For microloads, select from the accessories on page 10.
2. Refer to page 13 for contact ratings.

(6) Switch Action

Code	Description
M	Momentary
A	Alternate

Note: 1. Momentary operation: Self-resetting
2. Alternate operation: Self-holding
The Socket Unit holds and the Operation Unit resets.

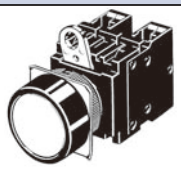
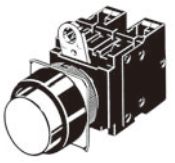
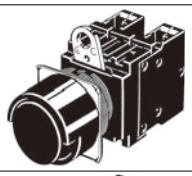
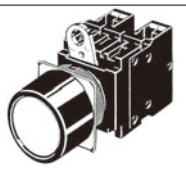
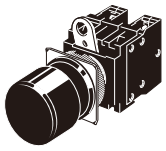
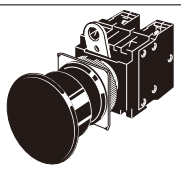
■ Ratings and characteristics: See pages 13 to 14. ■ Precautions for correct use: Refer to page 23.
■ Dimensions: Refer to page16. ■ Accessories and tools: See pages 10 to 12.

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Ordering Information

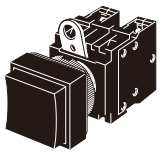
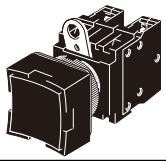
Completely Assembled..... Shipped as a set which includes the Pushbutton, Lamp (lighted type only), and Switch.

Non-lighted (Round Type)

Appearance	Output	Operation: Momentary operation (self-resetting) Set	Operation: Alternate operation (self-holding) Set	Illumination color
Round/Flat type A22-F 	SPST-NO	**A22-F□-10M**	**A22-F□-10A**	R (red) Y (yellow) G (green) W (white) A (blue) B (black)
	SPST-NC	**A22-F□-01M**	**A22-F□-01A**	
	SPST-NO + SPST-NC	**A22-F□-11M**	**A22-F□-11A**	
	DPST-NO	**A22-F□-20M**	**A22-F□-20A**	
	DPST-NC	**A22-F□-02M**	**A22-F□-02A**	
Round/Projection type A22-T 	SPST-NO	**A22-T□-10M**	**A22-T□-10A**	
	SPST-NC	**A22-T□-01M**	**A22-T□-01A**	
	SPST-NO + SPST-NC	**A22-T□-11M**	**A22-T□-11A**	
	SPST-NO + SPST-NO	**A22-T□-20M**	**A22-T□-20A**	
	SPST-NC + SPST-NC	**A22-T□-02M**	**A22-T□-02A**	
Round/Full-guard type A22-G 	SPST-NO	**A22-G□-10M**	**A22-G□-10A**	
	SPST-NC	**A22-G□-01M**	**A22-G□-01A**	
	SPST-NO + SPST-NC	**A22-G□-11M**	**A22-G□-11A**	
	SPST-NO + SPST-NO	**A22-G□-20M**	**A22-G□-20A**	
	SPST-NC + SPST-NC	**A22-G□-02M**	**A22-G□-02A**	
Round/Half-guard type A22-H 	SPST-NO	**A22-H□-10M**	**A22-H□-10A**	
	SPST-NC	**A22-H□-01M**	**A22-H□-01A**	
	SPST-NO + SPST-NC	**A22-H□-11M**	**A22-H□-11A**	
	SPST-NO + SPST-NO	**A22-H□-20M**	**A22-H□-20A**	
	SPST-NC + SPST-NC	**A22-H□-02M**	**A22-H□-02A**	
Round/Small-size Mushroom type (30-dia. head) A22-S 	SPST-NO	**A22-S□-10M**	---	
	SPST-NC	**A22-S□-01M**		
	SPST-NO + SPST-NC	**A22-S□-11M**		
	SPST-NO + SPST-NO	**A22-S□-20M**		
	SPST-NC + SPST-NC	**A22-S□-02M**		
Round/Medium-size Mushroom type (40-dia head) A22-M 	SPST-NO	**A22-M□-10M**		
	SPST-NC	**A22-M□-01M**		
	SPST-NO + SPST-NC	**A22-M□-11M**		
	SPST-NO + SPST-NO	**A22-M□-20M**		
	SPST-NC + SPST-NC	**A22-M□-02M**		

Note: The contact ratings are for standard loads.

Non-lighted (Square Type)

Appearance	Output	Operation: Momentary operation (self-resetting) Set	Operation: Alternate operation (self-holding) Set	Illumination color
Square/Projection type A22-C 	SPST-NO	**A22-C□-10M**	**A22-C□-10A**	R (red) Y (yellow) G (green) W (white) A (blue) B (black)
	SPST-NC	**A22-C□-01M**	**A22-C□-01A**	
	SPST-NO + SPST-NC	**A22-C□-11M**	**A22-C□-11A**	
	SPST-NO + SPST-NO	**A22-C□-20M**	**A22-C□-20A**	
	SPST-NC + SPST-NC	**A22-C□-02M**	**A22-C□-02A**	
Square/Guard type A22-D 	SPST-NO	**A22-D□-10M**	**A22-D□-10A**	
	SPST-NC	**A22-D□-01M**	**A22-D□-01A**	
	SPST-NO + SPST-NC	**A22-D□-11M**	**A22-D□-11A**	
	SPST-NO + SPST-NO	**A22-D□-20M**	**A22-D□-20A**	
	SPST-NC + SPST-NC	**A22-D□-02M**	**A22-D□-02A**	

Note: The contact ratings are for standard loads.

Individual models: Refer to pages 7 to 9.
(The Pushbutton, Lamp, and Switch can be ordered

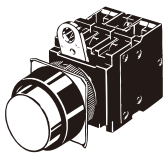
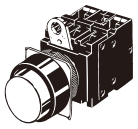
■ Ratings and characteristics: See pages 13 to 14. ■ Dimensions: Refer to page 16.
■ Accessories and tools: See pages 10 to 12.

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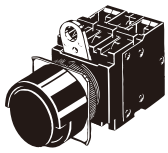
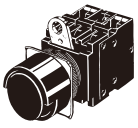
Ordering Information

Completely Assembled .....Shipped as a set which includes the Pushbutton, Lamp (lighted type only), and Switch.

Lighted (Round Type)

Appearance	Output	Lighting	Operating voltage	Momentary operation (self-resetting) Set	Alternate operation (self-holding) Set	Illumination color
Round/Projection type LED lighting (without Voltage Reduction Unit) A22L-T 	SPST-NO	LED	6 VDC	**A22L-T□-6D-10M**	**A22L-T□-6D-10A**	R (red) Y (yellow) G (green) W (white) A (blue)
			6 VAC	**A22L-T□-6A-10M**	**A22L-T□-6A-10A**	
			12 VAC/VDC	**A22L-T□-12A-10M**	**A22L-T□-12A-10A**	
			24 VAC/VDC	**A22L-T□-24A-10M**	**A22L-T□-24A-10A**	
	SPST-NC		6 VDC	**A22L-T□-6D-01M**	**A22L-T□-6D-01A**	
			6 VAC	**A22L-T□-6A-01M**	**A22L-T□-6A-01A**	
			12 VAC/VDC	**A22L-T□-12A-01M**	**A22L-T□-12A-01A**	
			24 VAC/VDC	**A22L-T□-24A-01M**	**A22L-T□-24A-01A**	
	SPST-NO + SPST-NC		6 VDC	**A22L-T□-6D-11M**	**A22L-T□-6D-11A**	
			6 VAC	**A22L-T□-6A-11M**	**A22L-T□-6A-11A**	
			12 VAC/VDC	**A22L-T□-12A-11M**	**A22L-T□-12A-11A**	
			24 VAC/VDC	**A22L-T□-24A-11M**	**A22L-T□-24A-11A**	
	SPST-NO + SPST-NO		6 VDC	**A22L-T□-6D-20M**	**A22L-T□-6D-20A**	
			6 VAC	**A22L-T□-6A-20M**	**A22L-T□-6A-20A**	
			12 VAC/VDC	**A22L-T□-12A-20M**	**A22L-T□-12A-20A**	
			24 VAC/VDC	**A22L-T□-24A-20M**	**A22L-T□-24A-20A**	
	SPST-NC + SPST-NC		6 VDC	**A22L-T□-6D-02M**	**A22L-T□-6D-02A**	
			6 VAC	**A22L-T□-6A-02M**	**A22L-T□-6A-02A**	
			12 VAC/VDC	**A22L-T□-12A-02M**	**A22L-T□-12A-02A**	
			24 VAC/VDC	**A22L-T□-24A-02M**	**A22L-T□-24A-02A**	
Round/Projection type LED voltage-reduction lighting (with Voltage Reduction Unit) A22L-T 	SPST-NO		100 VAC	**A22L-T□-T1-10M**	**A22L-T□-T1-10A**	
			200 VAC	**A22L-T□-T2-10M**	**A22L-T□-T2-10A**	
	SPST-NC		100 VAC	**A22L-T□-T1-01M**	**A22L-T□-T1-01A**	
			200 VAC	**A22L-T□-T2-01M**	**A22L-T□-T2-01A**	
	SPST-NO + SPST-NC		100 VAC	**A22L-T□-T1-11M**	**A22L-T□-T1-11A**	
			200 VAC	**A22L-T□-T2-11M**	**A22L-T□-T2-11A**	
	SPST-NO + SPST-NO		100 VAC	**A22L-T□-T1-20M**	**A22L-T□-T1-20A**	
			200 VAC	**A22L-T□-T2-20M**	**A22L-T□-T2-20A**	
	SPST-NC + SPST-NC		100 VAC	**A22L-T□-T1-02M**	**A22L-T□-T1-02A**	
			200 VAC	**A22L-T□-T2-02M**	**A22L-T□-T2-02A**	

Note: The contact ratings are for standard loads.

Appearance	Output	Lighting	Operating voltage	Momentary operation (self-resetting) Set	Alternate operation (self-holding) Set	Illumination color
Round/Half-guard type LED lighting (without Voltage Reduction Unit) A22L-H 	SPST-NO	LED	24 VAC/VDC	**A22L-H□-24A-10M**	**A22L-H□-24A-10A**	R (red) Y (yellow) G (green) W (white) A (blue)
	SPST-NC			**A22L-H□-24A-01M**	**A22L-H□-24A-01A**	
	SPST-NO + SPST-NC			**A22L-H□-24A-11M**	**A22L-H□-24A-11A**	
	SPST-NO + SPST-NO			**A22L-H□-24A-20M**	**A22L-H□-24A-20A**	
	SPST-NC + SPST-NC			**A22L-H□-24A-02M**	**A22L-H□-24A-02A**	
Round/Half-guard type LED voltage-reduction lighting (with Voltage Reduction Unit) A22L-H 	SPST-NO		100 VAC	**A22L-H□-T1-10M**	**A22L-H□-T1-10A**	
			200 VAC	**A22L-H□-T2-10M**	**A22L-H□-T2-10A**	
	SPST-NC		100 VAC	**A22L-H□-T1-01M**	**A22L-H□-T1-01A**	
			200 VAC	**A22L-H□-T2-01M**	**A22L-H□-T2-01A**	
	SPST-NO + SPST-NC		100 VAC	**A22L-H□-T1-11M**	**A22L-H□-T1-11A**	
			200 VAC	**A22L-H□-T2-11M**	**A22L-H□-T2-11A**	
	SPST-NO + SPST-NO		100 VAC	**A22L-H□-T1-20M**	**A22L-H□-T1-20A**	
			200 VAC	**A22L-H□-T2-20M**	**A22L-H□-T2-20A**	
	SPST-NC + SPST-NC		100 VAC	**A22L-H□-T1-02M**	**A22L-H□-T1-02A**	
			200 VAC	**A22L-H□-T2-02M**	**A22L-H□-T2-02A**	

Note: The contact ratings are for standard loads.

Individual models: Refer to pages 7 to 9.
(The Pushbutton, Lamp, and Switch can be ordered separately.)

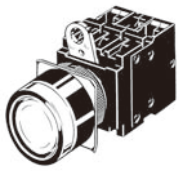
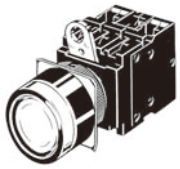
■ Ratings, characteristics, and dimensions: See pages 13 to 16.
■ Accessories and tools: See pages 10 to 12.

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Ordering Information

Completely Assembled..... Shipped as a set which includes the Pushbutton, Lamp (lighted type only), and Switch.

Lighted (Round Type)

Appearance	Output	Lighting	Operating voltage	Operation: Momentary operation (self-resetting) Set	Operation: Alternate operation (self-holding) Set	Illumination color
Round/Full-guard type LED lighting (without Voltage Reduction Unit) A22L-G 	SPST-NO	LED	6 VDC	**A22L-G□-6D-10M**	**A22L-G□-6D-10A**	R (red) Y (yellow) G (green) W (white) A (blue)
			6 VAC	**A22L-G□-6A-10M**	**A22L-G□-6A-10A**	
			12 VAC/VDC	**A22L-G□-12A-10M**	**A22L-G□-12A-10A**	
			24 VAC/VDC	**A22L-G□-24A-10M**	**A22L-G□-24A-10A**	
	SPST-NC		6 VDC	**A22L-G□-6D-01M**	**A22L-G□-6D-01A**	
			6 VAC	**A22L-G□-6A-01M**	**A22L-G□-6A-01A**	
			12 VAC/VDC	**A22L-G□-12A-01M**	**A22L-G□-12A-01A**	
			24 VAC/VDC	**A22L-G□-24A-01M**	**A22L-G□-24A-01A**	
	SPST-NO + SPST-NC		6 VDC	**A22L-G□-6D-11M**	**A22L-G□-6D-11A**	
			6 VAC	**A22L-G□-6A-11M**	**A22L-G□-6A-11A**	
			12 VAC/VDC	**A22L-G□-12A-11M**	**A22L-G□-12A-11A**	
			24 VAC/VDC	**A22L-G□-24A-11M**	**A22L-G□-24A-11A**	
	SPST-NO + SPST-NO		6 VDC	**A22L-G□-6D-20M**	**A22L-G□-6D-20A**	
			6 VAC	**A22L-G□-6A-20M**	**A22L-G□-6A-20A**	
			12 VAC/VDC	**A22L-G□-12A-20M**	**A22L-G□-12A-20A**	
			24 VAC/VDC	**A22L-G□-24A-20M**	**A22L-G□-24A-20A**	
	SPST-NC + SPST-NC		6 VDC	**A22L-G□-6D-02M**	**A22L-G□-6D-02A**	
			6 VAC	**A22L-G□-6A-02M**	**A22L-G□-6A-02A**	
			12 VAC/VDC	**A22L-G□-12A-02M**	**A22L-G□-12A-02A**	
			24 VAC/VDC	**A22L-G□-24A-02M**	**A22L-G□-24A-02A**	
Round/Full-guard type LED voltage-reduction lighting (with Voltage Reduction Unit) A22L-G 	SPST-NO		100 VAC	**A22L-G□-T1-10M**	**A22L-G□-T1-10A**	
			200 VAC	**A22L-G□-T2-10M**	**A22L-G□-T2-10A**	
	SPST-NC		100 VAC	**A22L-G□-T1-01M**	**A22L-G□-T1-01A**	
			200 VAC	**A22L-G□-T2-01M**	**A22L-G□-T2-01A**	
	SPST-NO + SPST-NC		100 VAC	**A22L-G□-T1-11M**	**A22L-G□-T1-11A**	
			200 VAC	**A22L-G□-T2-11M**	**A22L-G□-T2-11A**	
	SPST-NO + SPST-NO		100 VAC	**A22L-G□-T1-20M**	**A22L-G□-T1-20A**	
			200 VAC	**A22L-G□-T2-20M**	**A22L-G□-T2-20A**	
	SPST-NC + SPST-NC		100 VAC	**A22L-G□-T1-02M**	**A22L-G□-T1-02A**	
			200 VAC	**A22L-G□-T2-02M**	**A22L-G□-T2-02A**	

Note: The contact ratings are for standard loads.

Individual models: Refer to pages 7 to 9.
(The Pushbutton, Lamp, and Switch can be ordered separately.)

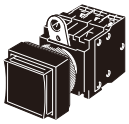
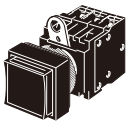
■ Ratings, characteristics, and dimensions: Refer to pages 13 to 16.
■ Accessories and tools: See pages 10 to 12.

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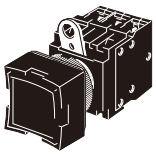
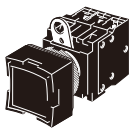
Ordering Information

Completely Assembled .....Shipped as a set which includes the Pushbutton, Lamp (lighted type only), and Switch.

Lighted (Square Type)

Appearance	Output	Lighting	Operating voltage	Momentary operation (self-resetting) Set	Alternate operation (self-holding) Set	Illumination color
Square/Projection type LED lighting (without Voltage Reduction Unit) A22L-C 	SPST-NO	LED	24 VAC/VDC	**A22L-C□-24A-10M**	**A22L-C□-24A-10A**	R (red) Y (yellow) G (green) W (white) A (blue)
	SPST-NC			**A22L-C□-24A-01M**	**A22L-C□-24A-01A**	
	SPST-NO + SPST-NC			**A22L-C□-24A-11M**	**A22L-C□-24A-11A**	
	SPST-NO + SPST-NO			**A22L-C□-24A-20M**	**A22L-C□-24A-20A**	
	SPST-NC + SPST-NC			**A22L-C□-24A-02M**	**A22L-C□-24A-02A**	
Square/Projection type LED voltage-reduction lighting (with Voltage Reduction Unit) A22L-C 	SPST-NO		100 VAC	**A22L-C□-T1-10M**	**A22L-C□-T1-10A**	
			200 VAC	**A22L-C□-T2-10M**	**A22L-C□-T2-10A**	
	SPST-NC		100 VAC	**A22L-C□-T1-01M**	**A22L-C□-T1-01A**	
			200 VAC	**A22L-C□-T2-01M**	**A22L-C□-T2-01A**	
	SPST-NO + SPST-NC		100 VAC	**A22L-C□-T1-11M**	**A22L-C□-T1-11A**	
			200 VAC	**A22L-C□-T2-11M**	**A22L-C□-T2-11A**	
	SPST-NO + SPST-NO		100 VAC	**A22L-C□-T1-20M**	**A22L-C□-T1-20A**	
			200 VAC	**A22L-C□-T2-20M**	**A22L-C□-T2-20A**	
	SPST-NC + SPST-NC		100 VAC	**A22L-C□-T1-02M**	**A22L-C□-T1-02A**	
			200 VAC	**A22L-C□-T2-02M**	**A22L-C□-T2-02A**	

Note: The contact ratings are for standard loads.

Appearance	Output	Lighting	Operating voltage	Momentary operation (self-resetting) Set	Alternate operation (self-holding) Set	Illumination color
Square/Full-guard type LED lighting (without Voltage Reduction Unit) A22L-D 	SPST-NO	LED	24 VAC/VDC	**A22L-D□-24A-10M**	**A22L-D□-24A-10A**	R (red) Y (yellow) G (green) W (white) A (blue)
	SPST-NC			**A22L-D□-24A-01M**	**A22L-D□-24A-01A**	
	SPST-NO + SPST-NC			**A22L-D□-24A-11M**	**A22L-D□-24A-11A**	
	SPST-NO + SPST-NO			**A22L-D□-24A-20M**	**A22L-D□-24A-20A**	
	SPST-NC + SPST-NC			**A22L-D□-24A-02M**	**A22L-D□-24A-02A**	
Square/Full-guard type LED voltage-reduction lighting (with Voltage Reduction Unit) A22L-D 	SPST-NO		100 VAC	**A22L-D□-T1-10M**	**A22L-D□-T1-10A**	
			200 VAC	**A22L-D□-T2-10M**	**A22L-D□-T2-10A**	
	SPST-NC		100 VAC	**A22L-D□-T1-01M**	**A22L-D□-T1-01A**	
			200 VAC	**A22L-D□-T2-01M**	**A22L-D□-T2-01A**	
	SPST-NO + SPST-NC		100 VAC	**A22L-D□-T1-11M**	**A22L-D□-T1-11A**	
			200 VAC	**A22L-D□-T2-11M**	**A22L-D□-T2-11A**	
	SPST-NO + SPST-NO		100 VAC	**A22L-D□-T1-20M**	**A22L-D□-T1-20A**	
			200 VAC	**A22L-D□-T2-20M**	**A22L-D□-T2-20A**	
	SPST-NC + SPST-NC		100 VAC	**A22L-D□-T1-02M**	**A22L-D□-T1-02A**	
			200 VAC	**A22L-D□-T2-02M**	**A22L-D□-T2-02A**	

Note: The contact ratings are for standard loads.

Individual models: Refer to pages 7 to 9.
(The Pushbutton, Lamp, and Switch can be ordered separately.)

■ Ratings, characteristics, and dimensions: See pages 13 to 16.
■ Accessories and tools: See pages 10 to 12.

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Ordering Information

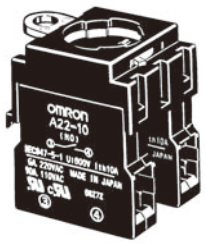
Subassembled ..... The Pushbutton, Lamp, or Switch can be ordered separately. Use them in combination for models that are not available as assembled Units. These can also be used as inventory for maintenance parts.

Non-lighted Models

Pushbutton



Switch



Lighted Models (without Voltage Reduction Unit)

Pushbutton



Lamp

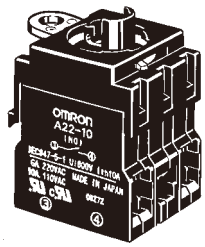
Incandescent lamp



LED



Switch (without Voltage Reduction Unit)



Lighted Models (with Voltage Reduction Unit)

Pushbutton

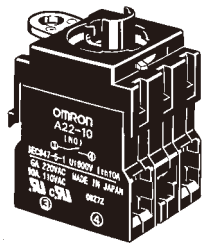


Lamp

LED



Switch (with Voltage Reduction Unit)



Ordering set combinations: Refer to pages 3 to 6.

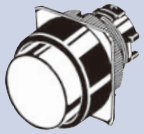
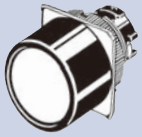
■ Ratings, characteristics, and dimensions: See pages 13 to 16.
■ Accessories and tools: See pages 10 to 12.

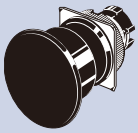
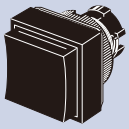
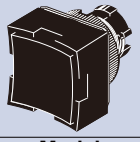
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Ordering Information

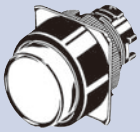
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Pushbutton
Non-lighted

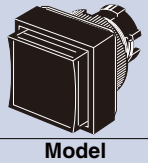
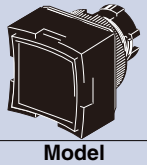
Sealing	IP65 oil-resistant models			
	Flat type	Projection type	Full-guard type	Half-guard type
Appearance				
Color	Model	Model	Model	Model
Red	A22-FR	A22-TR	A22-GR	A22-HR
Green	A22-FG	A22-TG	A22-GG	A22-HG
Yellow	A22-FY	A22-TY	A22-GY	A22-HY
White	A22-FW	A22-TW	A22-GW	A22-HW
Blue	A22-FA	A22-TA	A22-GA	A22-HA
Black	A22-FB	A22-TB	A22-GB	A22-HB

Sealing	IP65 oil-resistant models			
	Round/Mushroom type (30-dia. head)	Round/Mushroom type (40-dia. head)	Square/Projection type	Square/Full-guard type
Appearance				
Color	Model	Model	Model	Model
Red	A22-SR	A22-MR	A22-CR	A22-DR
Green	A22-SG	A22-MG	A22-CG	A22-DG
Yellow	A22-SY	A22-MY	A22-CY	A22-DY
White	A22-SW	A22-MW	A22-CW	A22-DW
Blue	A22-SA	A22-MA	A22-CA	A22-DA
Black	A22-SB	A22-MB	A22-CB	A22-DB

Lighted

Sealing	IP65		
	Projection type	Full-guard type	Half-guard type
Appearance			
Color	Model	Model	Model
Red	A22-TR	A22-GR	A22-HR
Green	A22-TG	A22-GG	A22-HG
Yellow	A22-TY	A22-GY	A22-HY
White	A22-TW	A22-GW	A22-HW
Blue	A22-TA	A22-GA	A22-HA

Note: Common to incandescent lamps and LED lamps.

Sealing	IP65	
	Square/Projection type	Square/Full-guard type
Appearance		
Color	Model	Model
Red	A22-CR	A22-DR
Green	A22-CG	A22-DG
Yellow	A22-CY	A22-DY
White	A22-CW	A22-DW
Blue	A22-CA	A22-DA

Ordering set combinations: Refer to pages 3 to 6.

■ Ratings, characteristics, and dimensions: See pages 13 to 16.
■ Accessories and tools: See pages 10 to 12.

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Ordering Information

Subassembled ..... The Pushbutton, Lamp, or Switch can be ordered separately. Use them in combination for models that are not available as assembled Units. These can also be used as inventory for maintenance parts.

Lamp
LED Lamp

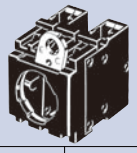
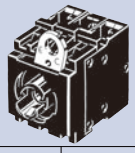
Appearance		Operating voltage / LED light	6 V Model	12 V Model	24 V Model	24 V Super-bright Model
	DC	Red	A22-6DR	---	---	---
		Green	A22-6DG	---	---	---
		Yellow *2	A22-6DY	---	---	---
		Blue	A22-6DA	---	---	---
	AC	Red	A22-6AR	---	---	---
		Green	A22-6AG	---	---	---
		Yellow *2	A22-6AY	---	---	---
		Blue	A22-6AA	---	---	---
	AC and DC	Red	---	A22-12AR	A22-24AR	A22-24ASR
		Green	---	A22-12AG	A22-24AG	A22-24ASG
		Yellow *2	---	A22-12AY	A22-24AY	A22-24ASY
		Blue	---	A22-12AA	A22-24AA	A22-24ASA

*1. For voltage-reduction lighting, use the A22-24A□. Only 24-V LED lamps can be used.
*2. Used when the Pushbutton color is yellow or white.

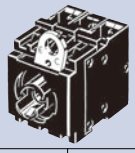
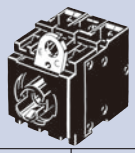
Incandescent Lamp

Appearance  Operating voltage	5 VAC/VDC	12 VAC/VDC	24 VAC/VDC
	A22-5	A22-12	A22-24

Switch (Standard Load)
No Voltage Reduction Unit

Classification		Non-lighted		Lighted	
Appearance					
Operation		Momentary	Alternate	Momentary	Alternate
Contacts		Model	Model	Model	Model
Standard load	SPST-NO	A22-10M	A22-10A	A22L-10M	A22L-10A
	SPST-NC	A22-01M	A22-01A	A22L-01M	A22L-01A
	SPST-NO + SPST-NC	A22-11M	A22-11A	A22L-11M	A22L-11A
	SPST-NO + SPST-NO	A22-20M	A22-20A	A22L-20M	A22L-20A
	SPST-NC + SPST-NC	A22-02M	A22-02A	A22L-02M	A22L-02A

Voltage Reduction Unit

Classification		110 VAC, Lighted		220 VAC, Lighted	
Appearance					
Operation		Momentary	Alternate	Momentary	Alternate
Contacts		Model	Model	Model	Model
Standard load	SPST-NO	A22L-10M-T1	A22L-10A-T1	A22L-10M-T2	A22L-10A-T2
	SPST-NC	A22L-01M-T1	A22L-01A-T1	A22L-01M-T2	A22L-01A-T2
	SPST-NO + SPST-NC	A22L-11M-T1	A22L-11A-T1	A22L-11M-T2	A22L-11A-T2
	SPST-NO + SPST-NO	A22L-20M-T1	A22L-20A-T1	A22L-20M-T2	A22L-20A-T2
	SPST-NC + SPST-NC	A22L-02M-T1	A22L-02A-T1	A22L-02M-T2	A22L-02A-T2

*1. A DPST-NO model is shown here as an example.
*2. For a model with a Voltage Reduction Unit, use the A22-24A□. Only 24-V LED lamps can be used.

Ordering set combinations: Refer to pages 3 to 6.

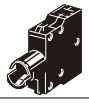
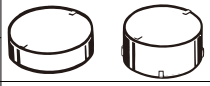
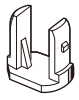
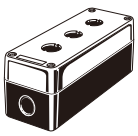
■ Ratings, characteristics, and dimensions: See pages 13 to 16.
■ Accessories and tools: See pages 10 to 12.

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Ordering Information

Accessories (Order Separately)

Accessories

Item		Appearance	Classification			Model	Remarks
Switch Blocks			SPST-NO	Standard load		**A22-10**	Order Switch Blocks to add an SPST-NO (A22-10) or SPST-NC (A22-01) Switch Block (for standard loads) or to replace a Switch Block.
				Microload		**A22-10S**	
			SPST-NC	Standard load		**A22-01**	
				Microload		**A22-01S**	
			DPST-NO	Standard load		**A22-20**	
				Microload		**A22-20S**	
			DPST-NC	Standard load		**A22-02**	
				Microload		**A22-02S**	
			SPST-NO + SPST-NC	Standard load		**A22-11**	
				Microload		**A22-11S**	
Lamp Sockets			Direct lighting			**A22-TN**	
			Voltage-reduction lighting	110 VAC		**A22-T1**	Used when changing the lighting method. (LED only)
				220 VAC		**A22-T2**	
Mounting Latches			For momentary models			**A22-3200**	Provided as standard. Order Mounting Latches only when mounting Switch Blocks or Lamp Sockets that are purchased individually.
			For alternate models			**A22-3210**	
Legend Plate Frames	Standard size		With Snap-in Legend Plate (Without text)		White	**A22Z-3321**	Snap-in Legend Plate is acrylic.
					Red	**A22Z-3322**	
					Black	**A22Z-3323**	
			Without Snap-in Legend Plate			**A22Z-3320**	
	Large size		With Snap-in Legend Plate (Without text)		White	**A22Z-3331**	Snap-in Legend Plate is acrylic.
					Red	**A22Z-3332**	
					Black	**A22Z-3333**	
			Without Snap-in Legend Plate			**A22Z-3330**	
Lock Ring			Round			**A22Z-3360**	This Lock Ring is used when a more secure lock feature is required.
Metallic Bezel Rings			For flat or projection models			**A22Z-3580**	Replace with the standard model. Material: nickel-plated zinc Cannot be used with the M22.
			For full-guard models			**A22Z-3582**	
Sealing Caps			For flat models			**A22Z-3600F**	Used to prevent dust or water from entering the Operation Unit (Pushbutton, etc.). Color: opaque Material: silicon
			For projection models			**A22Z-3600T**	
			For full-guard models			**A22Z-3600G**	
Color Caps			Red			**A22Z-30TR**	Used for changing the Pushbutton color of the (round) Pushbutton Switches. Cannot be used, however, with Half-guard Switches.
			Green			**A22Z-30TG**	
			Yellow			**A22Z-30TY**	
			White			**A22Z-30TW**	
			Blue			**A22Z-30TA**	
Caps	For A22		For projection, full-guard, or half-guard models			**A22Z-3490**	Material: polycarbonate resin
	For M22		For round models			**A22Z-3495**	
Three-throw Spacer			---			**A22Z-3003**	Used when mounting three Nonlighted Switches. Cannot be used with Alternate, Emergency Stop, Knob-type Selector, Key-type Selector, or Mushroom-type Switches. (See page 28.)
Hole Plug			Round			**A22Z-3530**	Can be plugged into pre-cut panel holes for future expansion. The color is black.
Control Boxes (Enclosures)			One hole	Exclusively for A22		**A22Z-B101**	For those designed exclusively for A22, DPST-NO or DPST-NC Switches cannot be used. A3T-compatible Control Boxes, A22-series alternate operation models, and DPST-NO, DPST-NC, and SPST-NO + SPST-NC contacts cannot be used. Material: Polycarbonate resin
				Compatible with A3T		**A22Z-B201**	
			One hole, yellow box (for emergency stop)	Exclusively for A22		**A22Z-B101Y**	
				Compatible with A3T		**A22Z-B201Y**	
			Two holes	Exclusively for A22		**A22Z-B102**	
				Compatible with A3T		**A22Z-B202**	
			Three holes	Exclusively for A22		**A22Z-B103**	
				Compatible with A3T		**A22Z-B203**	
Connectors			Applicable cable diameter (mm)	7 to 9 dia.		**A22Z-3500-1**	Plastic connector used to extend a cable from the Switch Box. (See 9 to 11 dia. A22Z-3500-2 page 27.)
				9 to 11 dia.		**A22Z-3500-2**	

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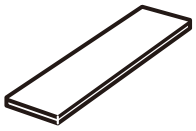
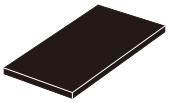
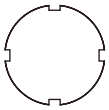
Ordering Information

Item	Appearance	Classification	Model	Remarks
25-dia. Ring		---	**A22Z-R25**	Use when mounting to a panel with a 25-dia. hole. For details, refer to page 18. Since this is not attached to the main body, order separately.
30-dia. Resin Attachment		Round	**A22Z-A30**	Use when mounting to a panel with a 30-dia. hole. For details, refer to page 20.
Lock Plate		---	**A22Z-3380**	Use to fix the lever on the Switch.
Simple Protective Cover		---	**A22Z-3700**	Prevents foreign matter entering into the Switch from the back of the panel.

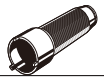
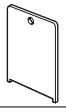
■ Ratings and characteristics: See pages 13 to 14. ■ Precautions for correct use: See page 23.
■ Dimensions: See page 16. ■ Accessories and tools: See pages 10 to 12.

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Ordering Information

Item		Appearance	Classification			Model	Remarks
Snap-in Legend Plates	Standard size		Without text	Black		**A22Z-3443B**	Attached to the Standard-size Legend Plate Frame. (See page 28.) Material: Acrylic
				Red		**A22Z-3443R**	
				White		**A22Z-3443W**	
				Transparent		**A22Z-3443C**	
			With text	White text on red background	❍	**A22Z-3443R-2**	
					STOP	**A22Z-3443R-4**	
					STOP	**A22Z-3443R-J4**	
				Black text on red background	EMERGENCY STOP	**A22Z-3443R-J1**	
				White text on black background	|	**A22Z-3443B-1**	
					START	**A22Z-3443B-3**	
					ON	**A22Z-3443B-5**	
					OFF	**A22Z-3443B-6**	
					UP	**A22Z-3443B-7**	
					DOWN	**A22Z-3443B-8**	
					POWER ON	**A22Z-3443B-9**	
					OFF-ON	**A22Z-3443B-10**	
					AUTO	**A22Z-3443B-J1**	
					MANUAL	**A22Z-3443B-J2**	
					START	**A22Z-3443B-J3**	
					RESET	**A22Z-3443B-J4**	
					ON	**A22Z-3443B-J5**	
					OFF	**A22Z-3443B-J6**	
					POWER ON	**A22Z-3443B-J7**	
					RUN	**A22Z-3443B-J8**	
					UP	**A22Z-3443B-J9**	
					DOWN	**A22Z-3443B-J10**	
					OFF-ON	**A22Z-3443B-J11**	
					MANUAL-AUTO	**A22Z-3443B-J12**	
					REVERSE-FORWARD	**A22Z-3443B-J13**	
					CLOSE-OPEN	**A22Z-3443B-J14**	
					MANUAL OFF AUTO	**A22Z-3443B-J15**	
	Large size		Without text	Black		**A22Z-3453B**	Used as an Emergency Stop Switch Legend Plate. (See page 28.) Material: Acrylic
				Red		**A22Z-3453R**	
				White		**A22Z-3453W**	
				Transparent		**A22Z-3453C**	
	For Emergency Stop Switch		Black text on yellow background	60-dia. round plate with black letters on a yellow background		**A22Z-3466-1**	EMERGENCY STOP is engraved on the plate. Used as an Emergency Stop Switch Legend Plate
				90-dia. round plate with black letters on a yellow background		**A22Z-3476-1**	
			No print (Round)			**A22Z-3460**	
Character Films			Character print (Round)	|		**A22Z-3460-1**	After printing on a film, affix to the indicator plate of the Lighted Pushbutton Switch. (The back is coated with adhesive.)
				❍		**A22Z-3460-2**	
				START		**A22Z-3460-3**	
				STOP		**A22Z-3460-4**	
			No print (Square)			**A22Z-3480**	

Tools

Item	Appearance	Classification	Model	Remarks
Lamp Extractor		---	**A22Z-3901**	Rubber tool used to easily replace Lamps
Tightening Wrench		---	**A22Z-3905**	Used to tighten mounting nuts from the back of the panel and to replace the cap of the Lighted Emergency Switch.
Cap Tightening Tool		---	**A22Z-3908**	Used for replacing the cap of the Half-guard Pushbutton Switch.
Cap Puller		---	**A3PJ-5080**	Used for removing the cap from the Pushbutton of the Square Lighted Pushbutton Switch.

■ Ratings and characteristics: See pages 13 to 14. ■ Precautions for correct use: See page 23.
■ Dimensions: See page 16. ■ Accessories and tools: See pages 10 to 12.

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Specifications

Approved Standard Ratings

UL, cUL (File No. E41515)

6 A at 220 VAC, 10 A at 110 VAC

EN60947-5-1 (Low Voltage Directive)

3 A at 220 VAC

CCC (GB14048.5)

3 A at 240 VAC, 1.5 A at 24 VDC

Ratings

Contacts (Standard Load)

Contacts (Standard Load)	Rated voltage	Rated current (A)			
		Inductive load	Resistive load	Inductive load	Resistive load
10A	24 VAC	10	10	---	---
	110 VAC	5	10		
	220 VAC	3	6		
	380 VAC	2	3		
	440 VAC	1	2		
	24 VDC	---	---	1.5	10
	110 VDC			0.5	2
	220 VDC			0.2	0.6
	380 VDC			0.1	0.2

Note: 1. The above ratings were obtained by conducting tests under the following conditions.
(1) Ambient temperature: 20±2°C
(2) Ambient humidity: 65±5% RH
(3) Operating frequency: 20 operations/minute
2. Minimum applicable load: 10 mA at 5 VDC

Contacts (Microload)

Rated applicable load	50 mA at 24 VDC (Resistive load)
Minimum applicable load	1 mA at 5 VDC

LED Indicators

Rated voltage	Rated current	Operating voltage
6 VDC	60 mA (20 mA)	6 VDC±5%
6 VAC	60 mA (20 mA)	6 VAC±5%
12 VAC/VDC	30 mA (10 mA)	12 VAC/VDC±5%
24 VAC/VDC	30 mA (10 mA)	24 VAC/VDC±5%

Note: Values in parentheses are for blue Pushbuttons.

Super-bright LED Indicator

Rated voltage	Rated current	Operating voltage
24 VAC/VDC	15 mA	24 VAC/VDC±5%

Incandescent Lamp

Rated voltage	Rated current	Operating voltage
6 VAC/VDC	200 mA	5 V
14 VAC/VDC	80 mA	12 V
28 VAC/VDC	40 mA	24 V

Voltage-reduction Lighting

Rated voltage	Operating voltage	Applicable lamp (BA9S/Base: 13)
110 VAC	100 VAC (95 to 115 V)	LED Lamp (A22-24A□)
220 VAC	200 VAC (190 to 230 V)	

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Specifications

Characteristics

Item		Pushbutton Switches		Emergency Stop Switches		Knob-type Selector Switches		Key-type Selector Switch	Indicator
		Non-lighted models: A22-F A22-T A22-G A22-H A22-S A22-M A22-C A22-D	Lighted models: A22L-T A22L-G A22L-H A22L-C A22L-D	Non-lighted model: A22E	Lighted model: A22EL	Non-lighted model: A22S	Lighted model: A22W	Non-lighted model: A22K	M22
Allowable operating frequency	Mechanical	Momentary operation: 60 operations/minute max.		30 operations/minute max.		Manual reset: 30 operations/minute max. Automatic reset: 30 operations/minute max.			---
	Electrical	30 operations/minute max.							---
Insulation resistance		100 MΩ min. (at 500 VDC)							
Dielectric strength	Between terminals of same polarity	2,500VAC, 50/60Hz for 1min							
	Between each terminal and ground	2,500VAC, 50/60Hz for 1min							
Vibration resistance	Malfunction *1	Malfunction *2: 10 to 55 Hz, 1.5-mm double amplitude							
Shock resistance	Destruction	1,000 m/s²	1,000 m/s²	1,000 m/s²		1,000 m/s²	1,000 m/s²	1,000 m/s²	1,000 m/s²
	Malfunction *1	1,000 m/s² max.	600 m/s² max.	250 m/s² max.		1,000 m/s² max.	600 m/s² max.	1000 m/s² max.	600 m/s² max.
Durability	Mechanical	Momentary operation: 5,000,000 operations min.		300,000 operations min.		500,000 operations min.	100,000 operations min.	500,000 operations min.	---
	Electrical	500,000 operations min.		300,000 operations min.		500,000 operations min.	100,000 operations min.	500,000 operations min.	---
Ambient operating temperature * 2		–20°C to 70°C	–20°C to 55°C	–20°C to 70°C	–20°C to 55°C	–20°C to 70°C	–20°C to 55°C	–20°C to 70°C	–20°C to 55°C
Ambient operating humidity		35% to 85% RH							
Ambient storage temperature *2		–40°C to 70°C							
Degree of protection *3		IP65 (oil-resistant)	IP65	IP65 (oil-resistant)	IP65	IP65 (oil-resistant)	IP65	IP65 (oil-resistant)	IP65
Electric shock protection class		Class II							
PTI (tracking characteristic)		175							
Degree of contamination		3 (IEC947-5-1)							

*1. Malfunction within 1 ms.
*2. With no icing or condensation.
*3. Degree of protection from the front of the panel.

Operating Characteristics (for SPST-NO/SPST-NC)

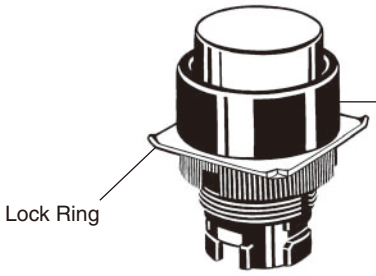
Item	Type	Pushbutton Switches	Emergency Stop Switches		Knob-type Selector		Key-type Selector Switch	
		Lighted Nonlighted Pushbutton Switches	Push-lock turn reset system/ Push-lock, key reset	Push-pull	Manual reset	Automatic reset	Manual reset	Automatic reset
		A22-F A22-T A22-G A22-H A22-C A22-D A22-S A22-M A22L-T A22L-G A22L-H A22L-C A22L-D	A22E A22EL A22E-□K	A22E-□P	A22S A22W		A22K	
Total travel force (TTF) max.		29.4 N	44.1 N	58.8 N	0.34 N·m*	0.25 N·m for two notches * 0.34 N·m for three notches *	0.34 N·m*	0.25 N·m for two notches * 0.34 N·m for three notches *
Total travel (TT)		5.5 mm max.	10±1 mm	5.5±1 mm	Approx. 90° for two notches (Approx. 45° for three notches)		Approx. 90° for two notches (Approx. 45° for three notches)	
Resetting force (RF) min.		---	0.25 N·m max.*	58.8N max.	0.34 N·m max.*	---	0.34 N·m max.*	---

* Rotation torque for Emergency Stop Pushbutton, Knob-type Selector, and Key-type Selector Switches.

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Nomenclature

Model Structure



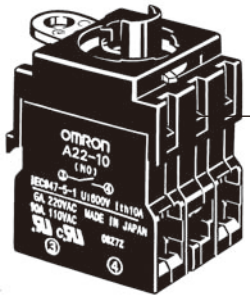
Pushbutton

- Available Colors
  Non-lighted:
  Red, Green, Yellow, White, Blue, Black
  Lighted:
  Red, Green Yellow, White, Blue



Lamp

- Light Source
  LED lamp
  Incandescent lamp



Switch

- Contacts
  SPST-NO, SPST-NC, SPST-NO + SPST-NC,
  SPST-NO + SPST-NO, SPST-NC + SPST-NC
  (Minimum applicable load: 10 mA at 5 VDC)
- Lighting Method
  Non-lighted
  Lighted (without Voltage Reduction Unit)
  Lighted (with Voltage Reduction Unit)

The above illustration shows a lighted model.

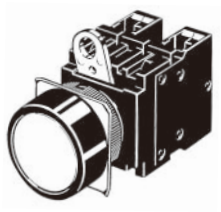
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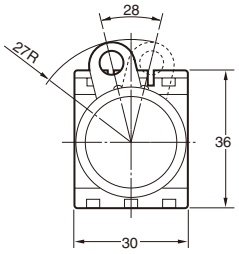
Dimensions

(Unit: mm)

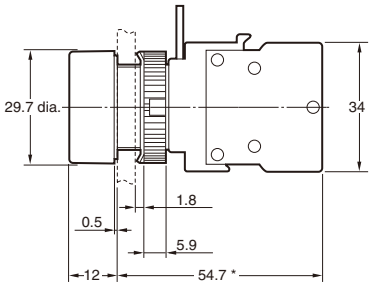
Lighted/Non-lighted Pushbutton Switches (The following illustrations are for momentary operation.)

Flat Type/A22-F

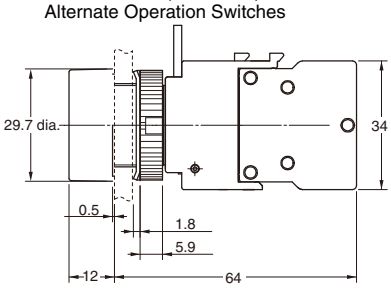




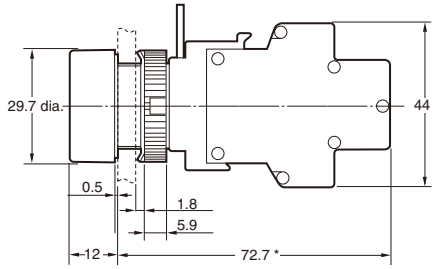
For SPST-NO (SPST-NC) Switches



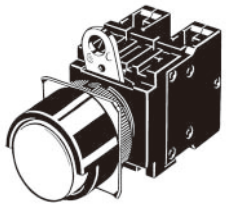
For SPST-NO (SPDT-NC)
Alternate Operation Switches

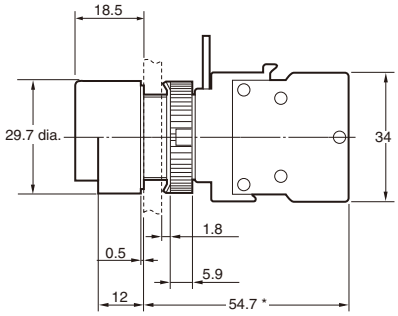


For DPST-NO (DPST-NC)
Monoblock-contact Switches

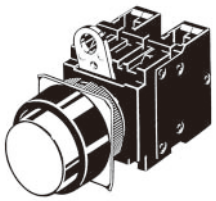


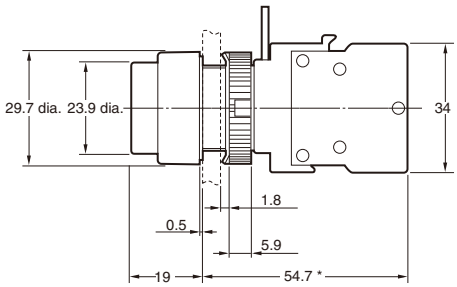
Half-guard Type/A22-H/A22L-H



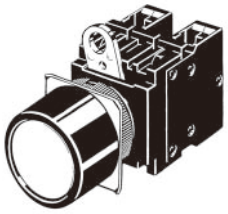


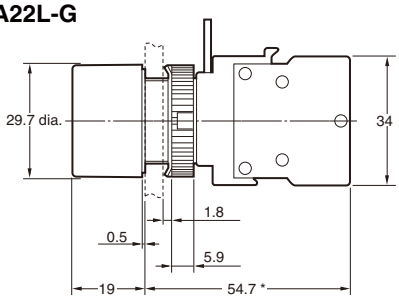
Projection Type/A22-T/A22L-T



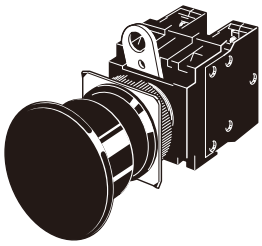


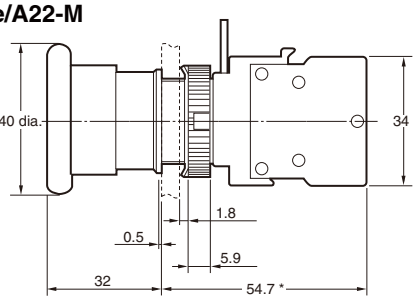
Full-guard Type/A22-G/A22L-G



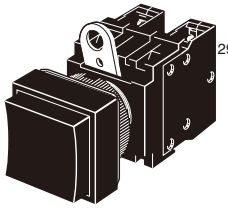


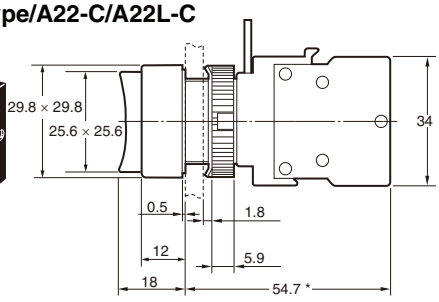
40-dia. Mushroom Type/A22-M



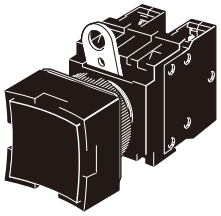


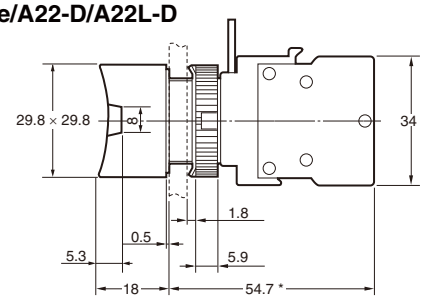
Square/Projection type/A22-C/A22L-C





Square/Full-guard Type/A22-D/A22L-D





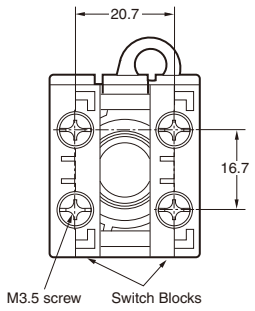
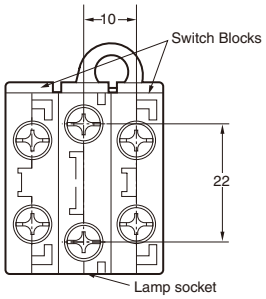
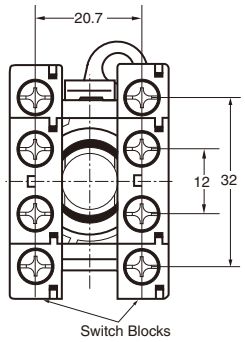
Note: Lighted models have the same dimensions as shown above, whether they are with or without Voltage Reduction Units.
* Alternate operation models are 9.3 mm longer.

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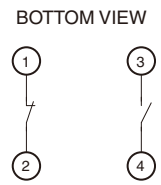
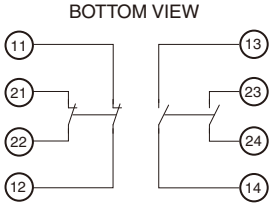
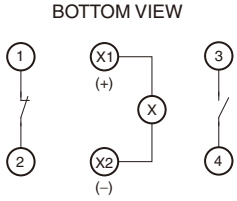
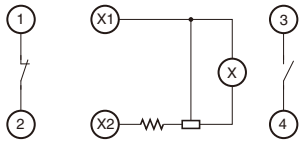
Dimensions

(Unit: mm)

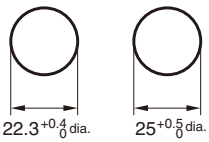
Terminal Arrangement (Bottom View)

Non-lighted (SPST-NO + SPST-NC)	Lighted (SPST-NO + SPST-NC)	Non-lighted (DPST-NO + DPST-NC)
		

Terminal Connection

Item	Terminal connection
Non-lighted (SPST-NO + SPST-NC)	
Non-lighted (DPST-NO + DPST-NC)	
Lighted without Voltage Reduction Unit (SPST-NO + SPST-NC)	
Lighted with Voltage Reduction Unit (SPST-NO + SPST-NC)	

Panel Cutouts



Lock ring is provided as a standard item.

- When applying coating such as paint to the panel, the dimensions should be those after the application of coating.
- Recommended panel thickness: 1 to 5 mm.
- Use an A22Z-R25 Ring when mounting to a panel with 25-mm holes.

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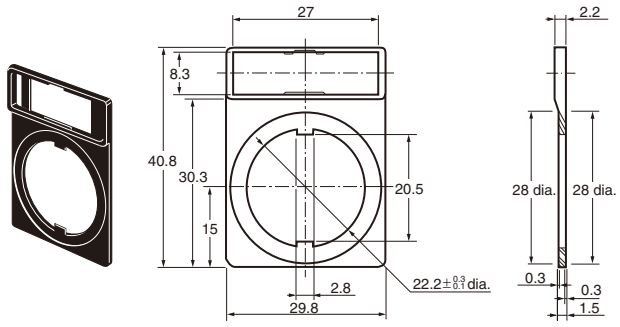
Dimensions

(Unit: mm)

Accessories

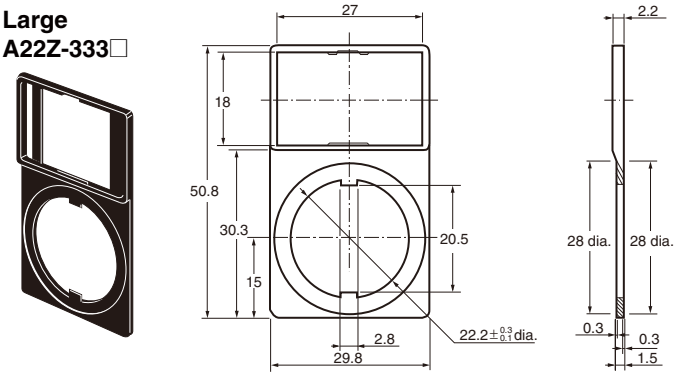
Legend Plate Frames

Standard Models A22Z-332□



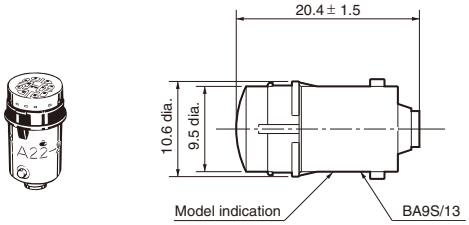
Large

A22Z-333□

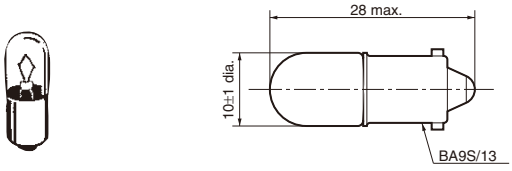


Lamp

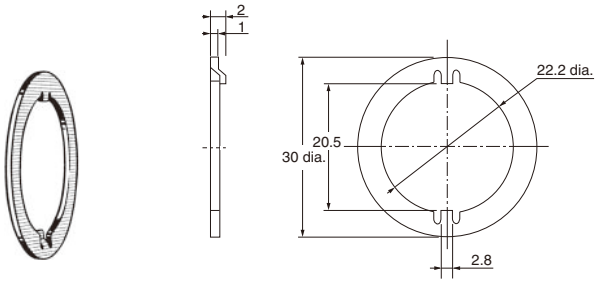
LED A22-6□, 12□, 24□



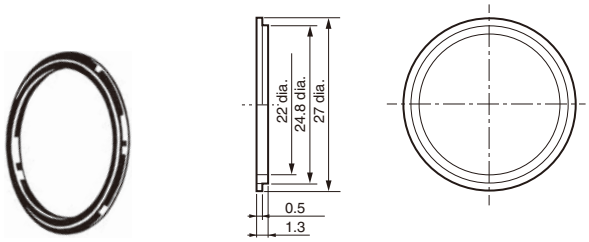
Incandescent lamp A22-5, 12, 24



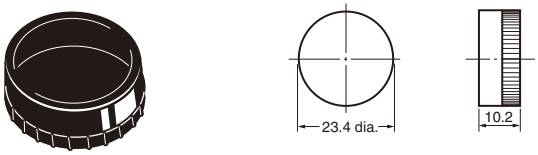
Lock Ring A22Z-3360



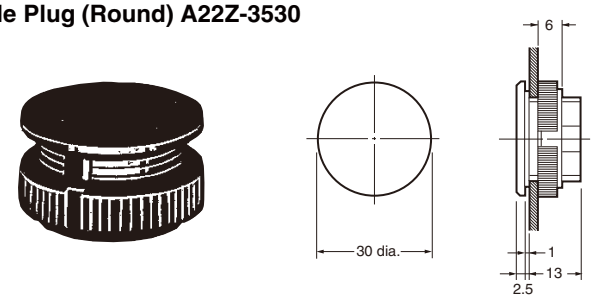
25-dia. Ring A22Z-R25



Color Cap A22Z-30T□

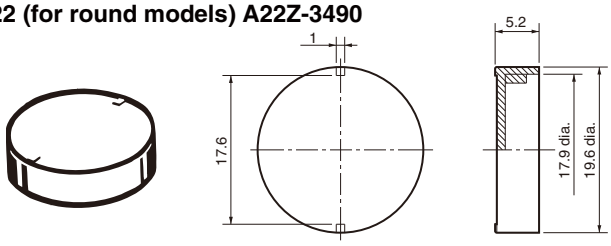


Hole Plug (Round) A22Z-3530

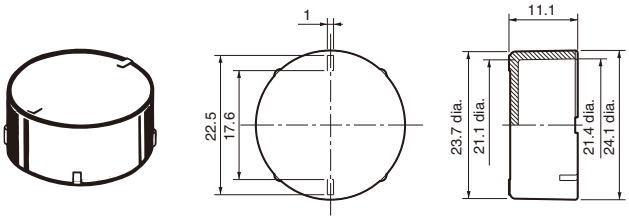


Caps

A22 (for round models) A22Z-3490



M22 (for round models) A22Z-3495



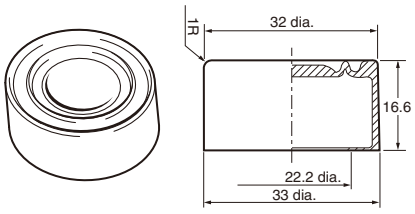
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Dimensions

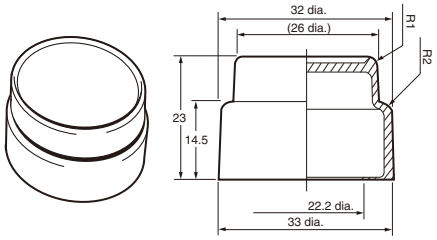
(Unit: mm)

Sealing Caps

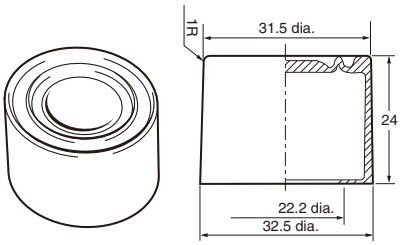
For Flat Models A22Z-3600F



For projection models A22Z-3600T

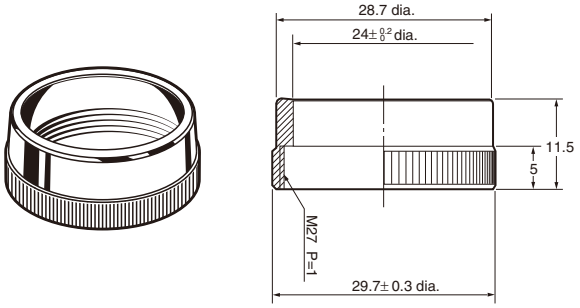


For full-guard models A22Z-3600G

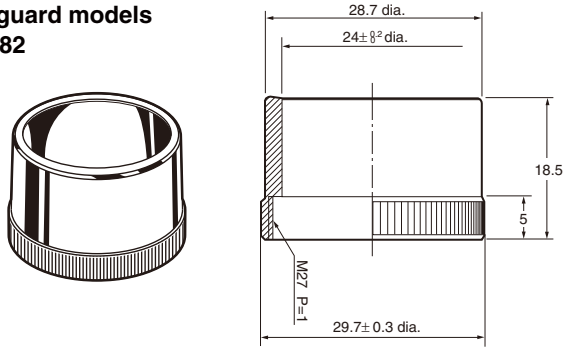


Metallic Bezel Rings

For Flat/Projection Models A22Z-3580

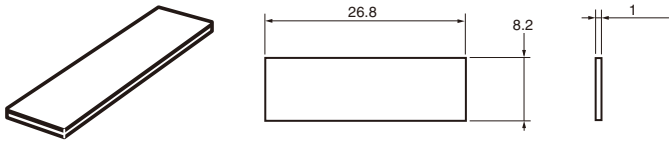


For full-guard models A22Z-3582

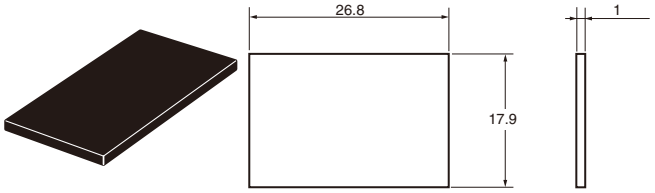


Snap-in Legend Plates

For Standard Models A22Z-3443□-□



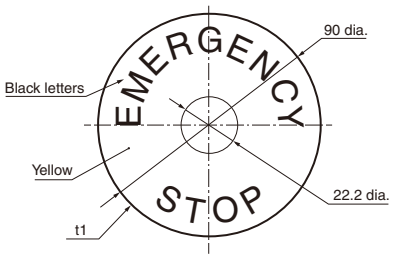
For Large Models A22Z-3453□



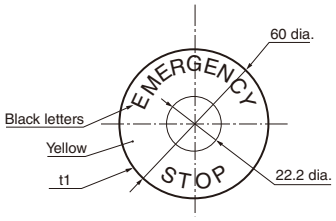
For Emergency-stop Models



A22Z-3476-1 (90 dia.)

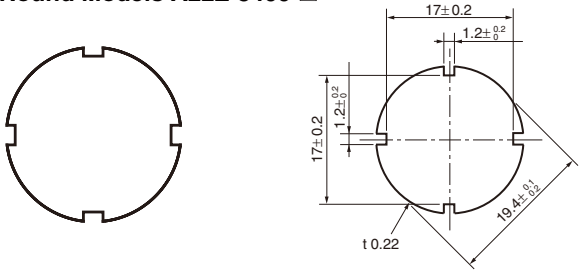


A22Z-3466-1 (60 dia.)

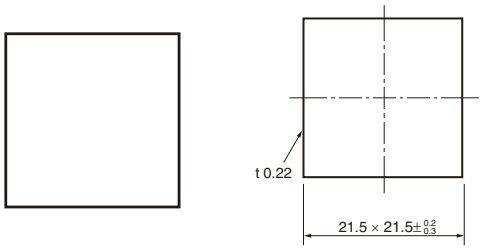


Character Film

For Round Models A22Z-3460-□



For Square Models A22Z-3480

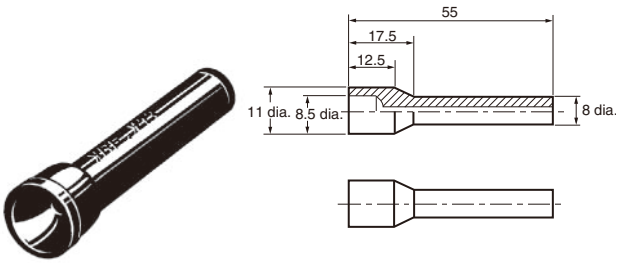


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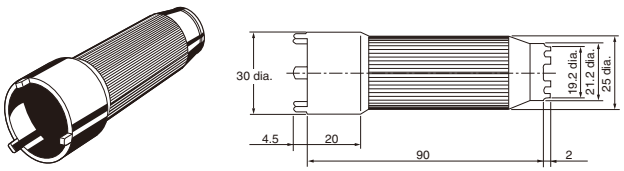
Dimensions

(Unit: mm)

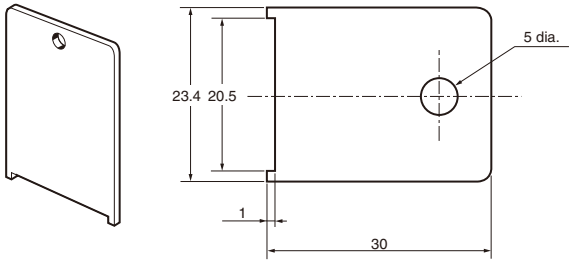
Lamp Extractor A22Z-3901



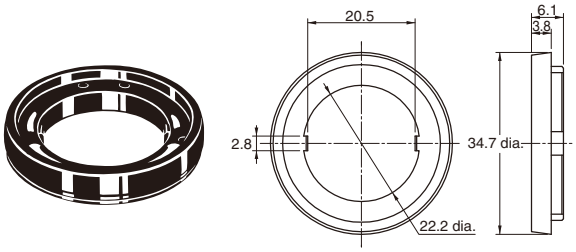
Tightening Wrench A22Z-3905



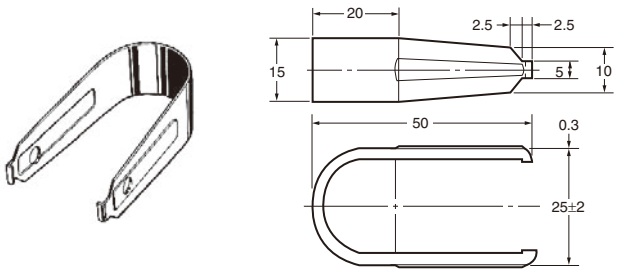
Cap Tightening Tool A22Z-3908



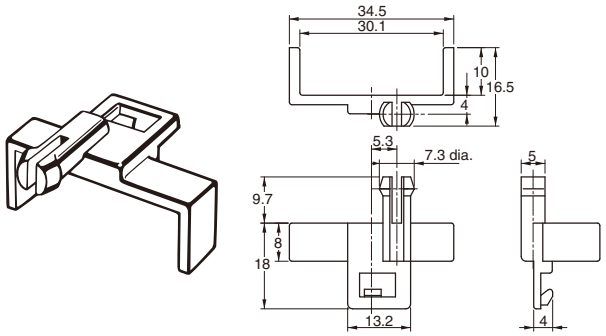
30-dia. Resin Attachment A22Z-A30



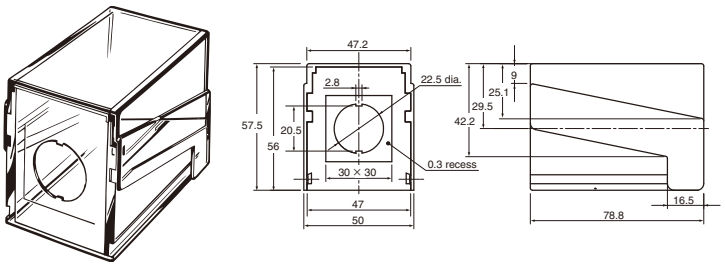
Cap Pul A3PJ-5080



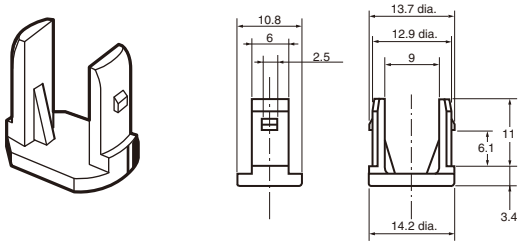
Lock Plate A22Z-3380



Simple Protective Cover A22Z-3700



Three-throw Spacer A22Z-3003

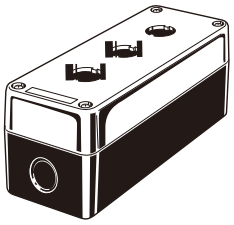


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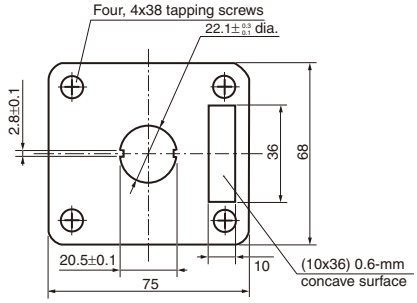
Dimensions

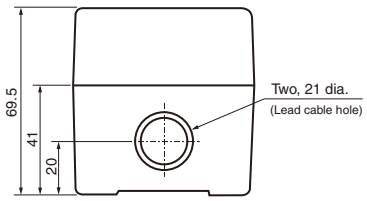
(Unit: mm)

Control Box (Enclosure) A22Z-B10□

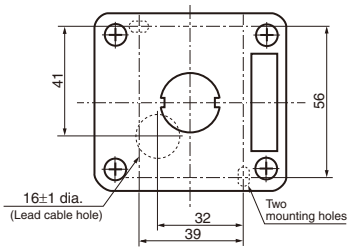


A22Z-B101 (One Hole)
A22Z-B101Y

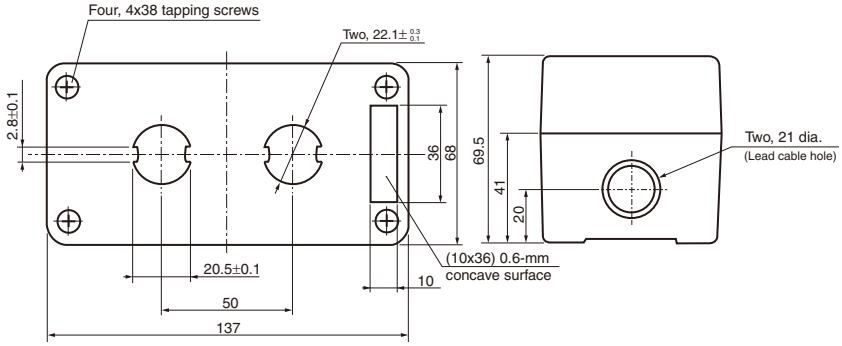




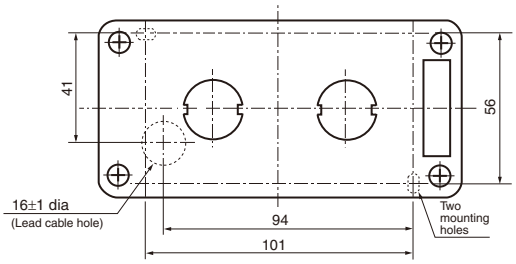
Cable Port Hole (Top View)



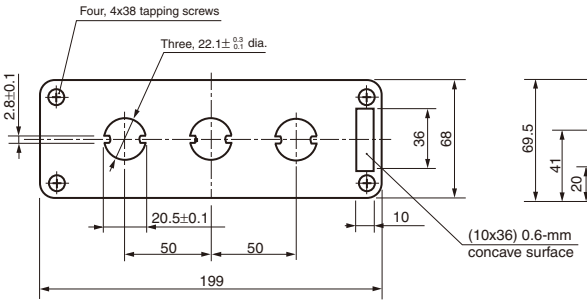
A22Z-B102 (Two Holes)

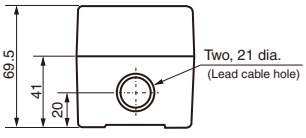


Cable Port Hole (Top View)

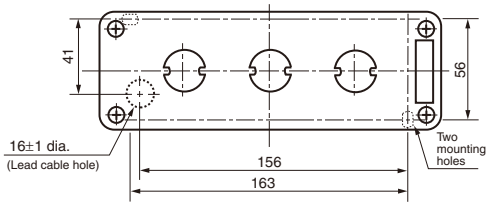


A22Z-B103 (Three Holes)

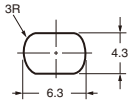




Cable Port Hole (Top View)



(Panel Mounting Hole)



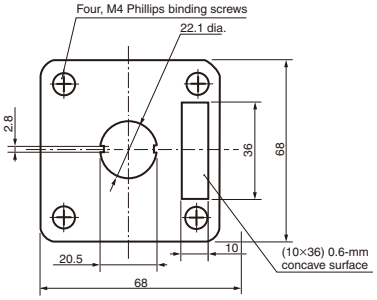
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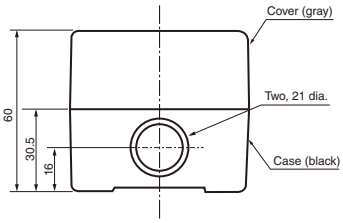
Dimensions

(Unit: mm)

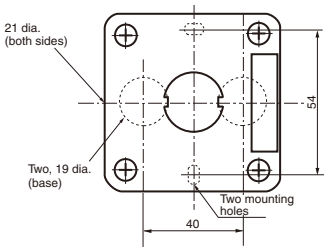
Control Box A22Z-B20□

A22Z-B201 (One Hole)
A22Z-B201Y



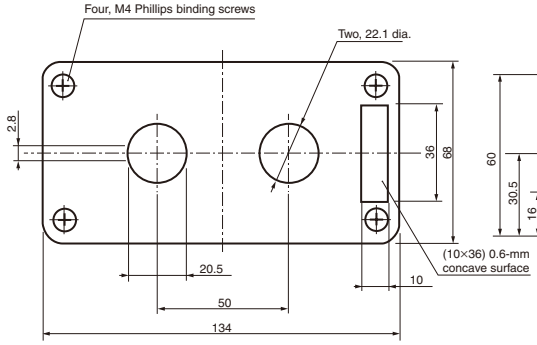


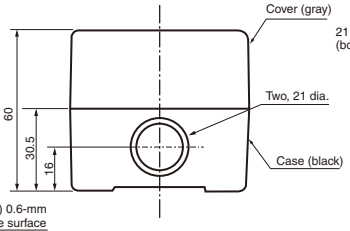
Cable Port Hole (Top View)

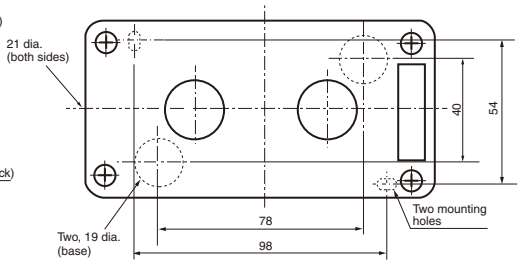


A22Z-B202 (Two Holes)

Cable Port Hole (Top View)

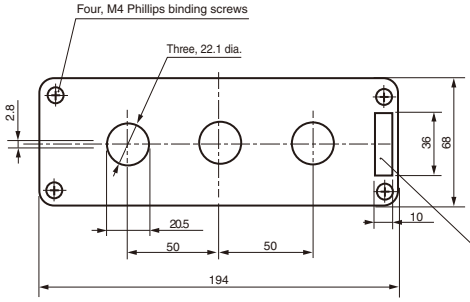


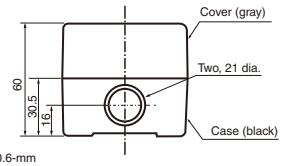


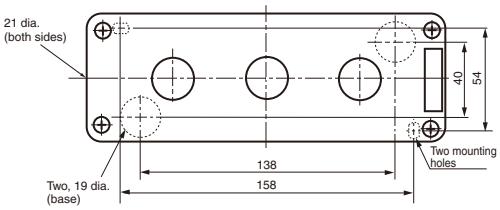


A22Z-B203 (Three Holes)

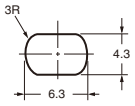
Cable Port Hole (Top View)







(Panel Mounting Hole)



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Safety Precautions

Refer to *Safety Precautions for All Pushbutton Switches*.

⚠ WARNING

Do not apply a voltage between the incandescent lamp and the terminal that is greater than the rated voltage. If the incandescent lamp is broken, the Operation Units may pop out.

Always turn OFF the power and wait for 10 minutes before replacing the incandescent lamp. If the lamp is replaced immediately after the power is turned OFF, the remaining heat may cause burns.

Precoutions for Correct Use

Mounting

- Do not perform wiring with power supplied to the Switch. Do not touch the terminals or other charged parts of the Switch while power is being supplied. Doing so may result in electric shock.
- Always make sure that the power is turned OFF before mounting, removing, or wiring the Switch, or performing maintenance.
  Do not tighten the mounting ring more than necessary using tools such as pointed-nose pliers. Doing so will damage the mounting ring.
  The tightening torque is 0.98 to 1.96 N·m.
- Recommended panel thickness: 1 to 5 mm.

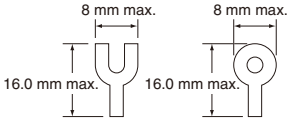
Wiring

- When DC-specific LEDs are used, wire the Switch so that the X1 terminal is positive.
- Terminal screws must be Phillips or slotted M3.5 screws with a square washer.
- The tightening torque is 1.08 to 1.27 N·m.
- Solid wires, stranded wires, and crimp terminals can be connected to the Switch.

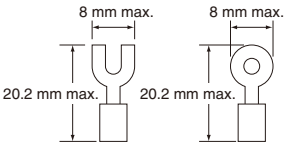
Applicable Wire Size

Stranded wire: 2 mm^2 max.
Solid wire: 1.6 dia. max.

Bare Crimp Terminals



Crimp Terminals with Insulating Sheath



- 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.
- This switch is intended for indoor use only.
  Using the Switch outdoors will result in failure.

LED

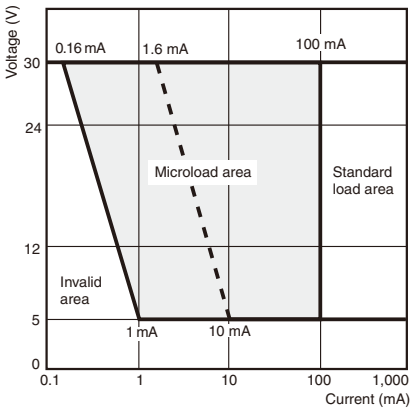
- The LED current-limiting resistor is built-in, so internal resistance is not required.
- If commercially available LEDs are used, select the ones that meet the following conditions:
  Base: BA9S/13
  Overall length: 26 mm max.
  Power consumption: 2.6 W max.

Others

- 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.

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 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, $\lambda\ 60 = 0.5 \times 10^{-6}$/operations indicates that the estimated malfunction rate is less than 1/2,000,000 operations with a reliability level of 60%.



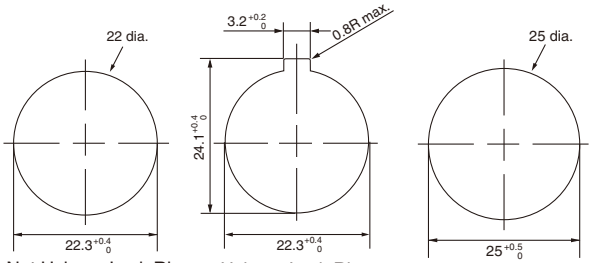
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Application

Mounting to the Panel

Panel Hole Dimensions

- Panel hole dimensions are given below.
- Recommended panel thickness: 1 to 5 mm.

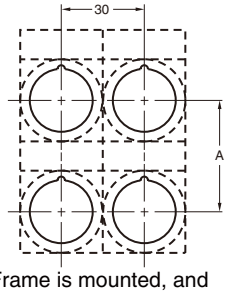


Not Using a Lock Ring Using a Lock Ring

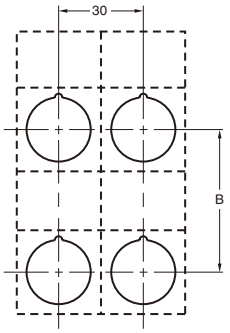
- For 25-dia. holes, always use 25-dia. Rings. (Since the cutout dimensions are large, IP65 cannot be guaranteed unless 25-dia. Rings are used.)
- If outer surface treatment such as coating is performed for the panel, the panel dimensions after outer surface treatment must meet the specified panel dimensions.

Matrix Installation

1. The following panel hole dimensions apply when Switch Unit and the Standard-size Legend Plate Frame and Lock Ring are mounted, and lead wires are connected directly to the Switch Block.



2. The following panel hole dimensions apply when the Large-size Legend Plate Frame is mounted, and when crimp terminals are connected to the Switch Block terminals.



Pitches A and B between the centers of the mounting holes are as follows:

For 1. above:

Switch Blocks	A
A22-10, A22-10S A22-01, A22-01S	45 mm min.
A22-20, A22-20S, A22-02 A22-02S, A22-11, A22-11S	55 mm min.

For 2. above:

Type of crimp terminal	Switch Blocks	B
Bare crimp terminals	A22-10, A22-10S A22-01, A22-01S	51 mm min.
	A22-20, A22-20S, A22-02 A22-02S, A22-11, A22-11S	61 mm min.
Crimp terminals with insulating sheath	A22-10, A22-10S A22-01, A22-01S	60 mm min.
	A22-20, A22-20S, A22-02 A22-02S, A22-11, A22-11S	70 mm min.

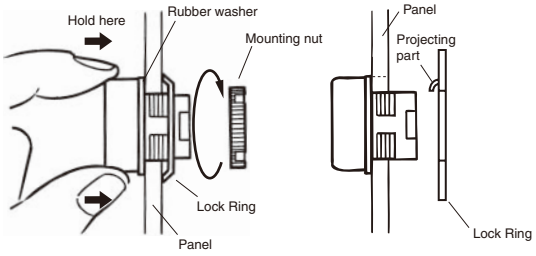
Note: 1. The above dimensions are the minimum dimensions for when the wires described under Applicable Wire Size on page 23 are used. If a different wires are used, the wiring dimensions may be different so determine an appropriate pitch before setup.
2. With pushbuttons of external dimensions greater than 30 mm, set the pitch according to the dimensions. (When using matrix installation for the A22-M□, mount with a pitch of 40 mm instead of 30 mm in the diagram above.)

Mounting the Operation Unit on the Panel

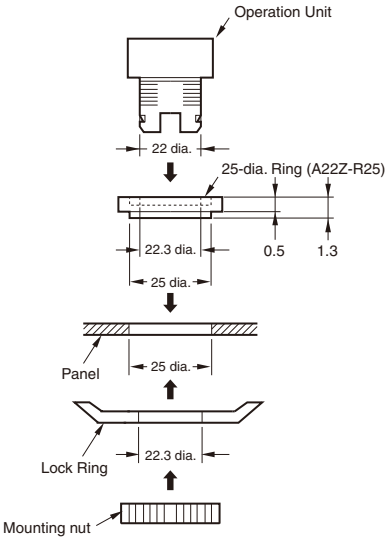
- Insert the Operation Unit (Pushbutton, etc.) from the front surface of the panel, insert the Lock Ring and the mounting nut from the terminal side, then tighten the nut. Before tightening, check that the rubber washer is present between the Pushbutton Unit and the panel.
- When using a Legend Plate Frame, put one rubber washer each between the Legend Plate Frame and the panel and between the Operation Unit and the Legend Plate Frame. (One rubber washer will be provided when one Legend Plate Frame is ordered.)
- Align the Lock Ring with the groove in the casing, then insert the Lock Ring so that its edge is located on the panel side.

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- Tighten the mounting nut at a torque of 0.98 to 1.96 N·m.
- When using a Lock Ring, replace with the supplied Lock Ring, insert the projecting part into the lock slot, and then tighten the mounting nut.

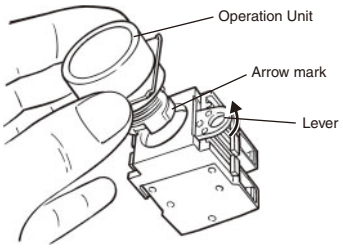


- When the panel cutout dimension is 25 dia., remove the supplied rubber washer and mount the 25-dia. Ring as shown below. (Since the A22Z-R25 is not attached to the main body, order separately.)



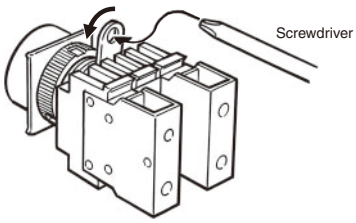
Mounting the Switch on the Pushbutton Unit

- Insert the Pushbutton Unit into the Switch Unit, aligning the arrow mark inscribed on the Case with the lever on the Switch Blocks, then move the lever in the direction indicated by the arrow in the following figure.



Removing the Switch

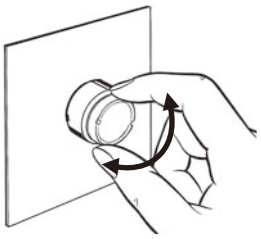
- Move the lever in the direction indicated by the arrow in the following figure, then pull the Pushbutton Unit or the Switch Blocks. Since the lever has a hole with an inside diameter of 6.5 mm, the lever can be moved in the specified direction by inserting a screwdriver into the hole and then moving the screwdriver.



Mounting/Replacing the Color Cap

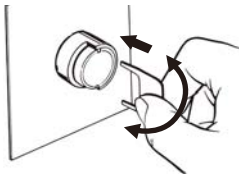
Projection, Fall-guard

- Grip and rotate the Color Cap with your fingers.



Half-guard Indicators

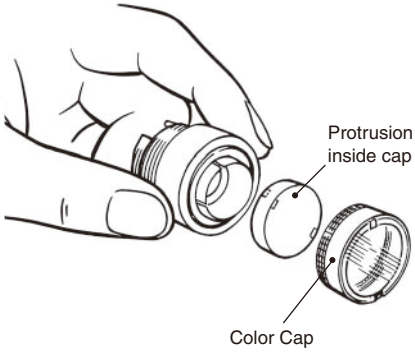
- Put the tips of the Cap Tightening Tool (A22Z-3908) into the Color Cap slot and turn the Tool.



Assembling the Cap

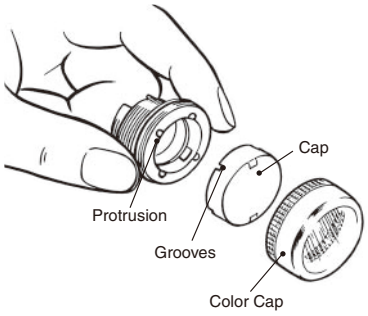
Lighted Pushbutton Switch

- Mount the Color Cap so that the protrusions inside the cap fit into the grooves in the Pushbutton Unit.



Indicator

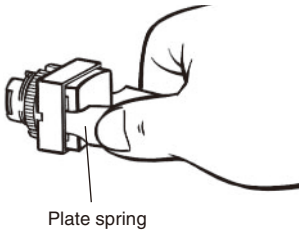
- Mount the Color Cap so that the protrusions inside the Pushbutton Unit fit into the grooves in the cap.



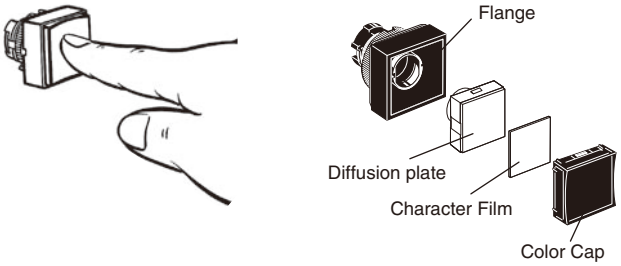
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Square Pushbutton/Indicator

- Square Pushbutton/Indicator
  Insert the protruding tip of the Cap Puller (A3PJ-5080) into the Cap slot, hold the plate spring, and pull them to remove the Color Cap.

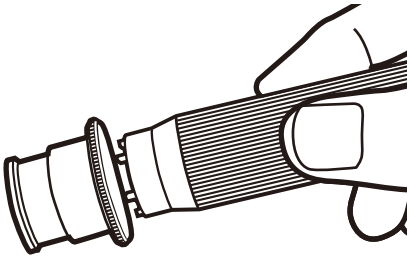


- Mounting the Color Cap:
  Mount the Color Cap on the flange and firmly push the Color Cap. When the Color Cap is inserted, check whether it operates properly. When replacing the Lamp, remove the Color Cap and diffusion plate with fingers or Cap Puller.
  Attach the Character Film properly so that it fits inside the protruding part of the diffusion plate. Then, match the diffusion plate to the square flange and insert the Cap.



Emergency Stop Switch

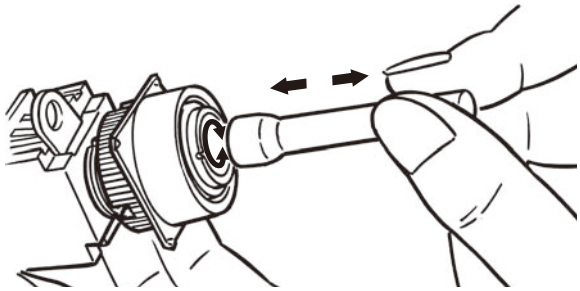
- Insert the protrusion of the Tightening Wrench (A22Z-3905) into the Cap slot and then turn to remove the Cap.



Installing/Replacing the Lamp

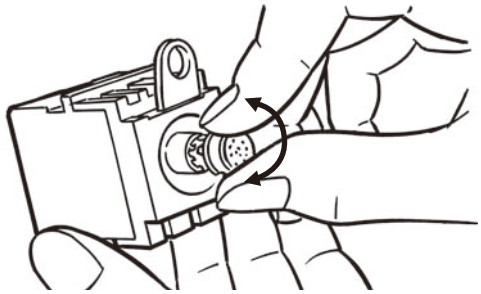
Installing/Replacing from the Panel Surface

- Insert the Lamp Extractor (A22Z-3901) into the lamp, then rotate the Extractor while pressing it.



Installing/Replacing on the Switch

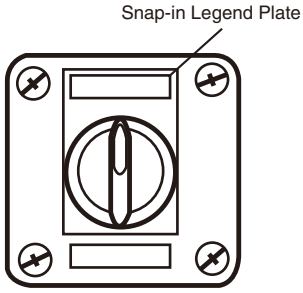
- Grip the lamp with your fingers, then rotate the lamp while pressing it against the Switch.



Control Box (Enclosure)

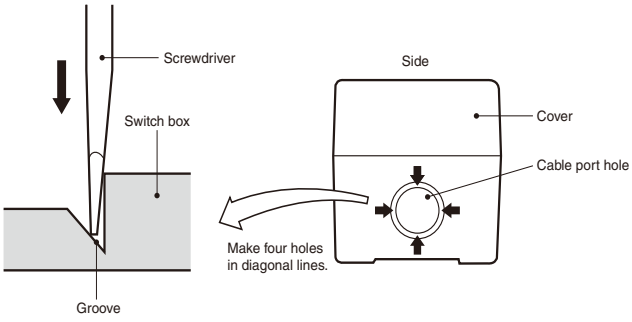
Mounting the Switch

The Standard-size Legend Plate Frame can be mounted. Mount the Frame as shown in the following diagram. Mount the Switch in the same way as for an ordinary panel.



Creating a Cable Port Hole

Place the tip of a screwdriver on the surface where the cable port hole is to be created with the cover attached and strike the screwdriver with a hammer to punch four holes.

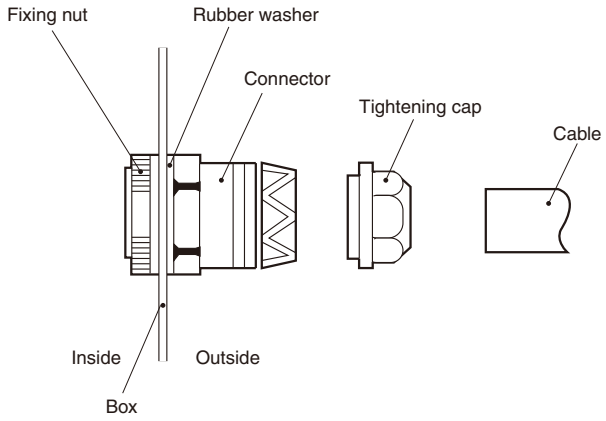


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Securing the Connector Cable

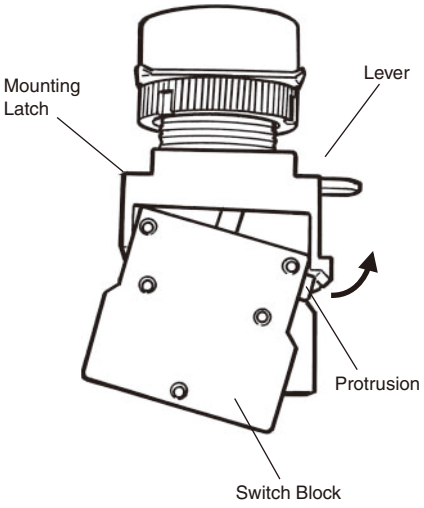
1. Insert the connector into the cable port hole in the Box and secure with the fixing nut inside the box.
2. Open a hole in the thin rubber section of the rubber ring.
3. Pass the tightening cap through the cable, insert the cable into the connector, and tighten the hexagonal nut to secure the cable.

Cable diameter	Connector
7 to 9 dia.	A22Z-3500-1
9 to 11 dia.	A22Z-3500-2



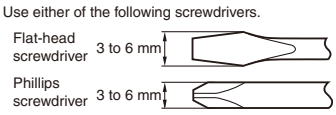
Installing the Switch Blocks

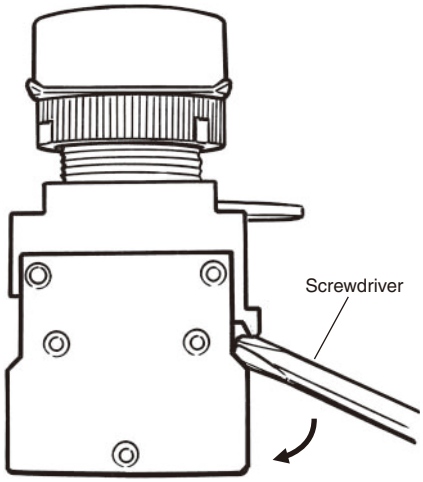
- Hook the small protrusion on the Switch Block into the groove on the Mounting Latch on the other side of the lever, then push up the Switch Block in the direction indicated by the arrow in the figure below.



Removing the Switch Blocks

- Insert a screwdriver between the Mounting Latch and the Switch Block, then push down the screwdriver in the direction indicated by the arrow in the following figure.

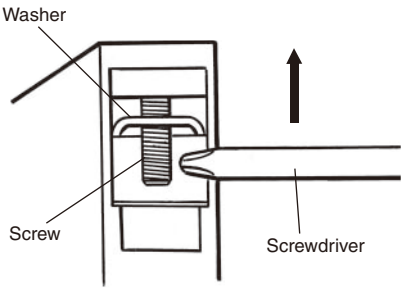




Wiring

Wiring Round Crimp Terminals

- Loosen the terminal screw from the Switch Unit until it completely comes off the groove, insert a screwdriver as shown in the following figure, then push up the washer in the direction indicated by the arrow to temporarily secure it. Now, a round crimp terminal can be connected. After inserting the terminal, tighten the screws to complete wiring.



Engraving

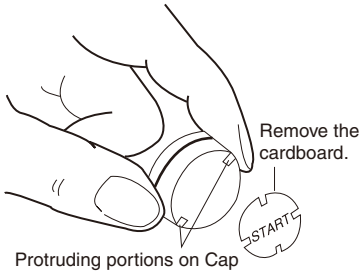
- Engrave the characters on the surface on the Cap. Make sure that the characters are aligned parallel to the imaginary line connecting the two protruding portions to the left and right of the Cap.
- The characters must not be engraved deeper than 0.5 mm. Apply an alcohol-based paint coating, such as melamine, alkyd, or acrylic resin paint coating, to the engraved characters.



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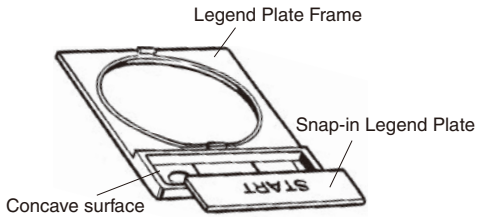
Affixing Character Film

- Hold the Cap, remove the cardboard on the Film, and attach the Film to the Cap. Make sure that the protruding portions of the Cap engage he cutout portions of the Film and that the characters are aligned parallel to the imaginary line connecting the two protruding portions to the left and right of the Cap.

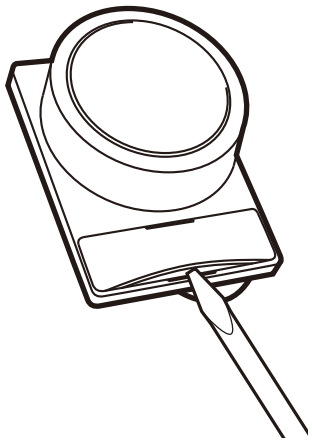


Mounting and Dismounting Snap-in Legend

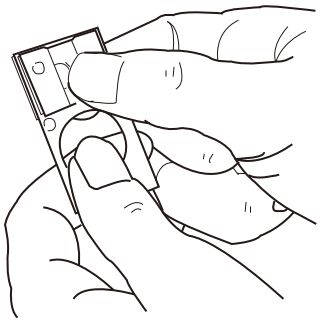
- Press and secure the Snap-in Legend Plate onto the Legend Plate Frame.
- The direction of the characters will vary with the mounting direction of the control panel if the Switch is a knob or key selector model.



- To easily remove the Snap-in Legend Plate from the Legend Plate Frame mounted to the panel, insert a Tool with a thin tip into the space between the Snap-in Legend Plate and the Legend Plate Frame.



- The Snap-in Legend Plate is easily removed by pressing the Snap-in Legend Plate from the back of the Legend Plate Frame.
- The Legend Plate Frame is made of acrylic resin, which is easily damaged by shock. Be sure to handle the Legend Plate Frame with care.



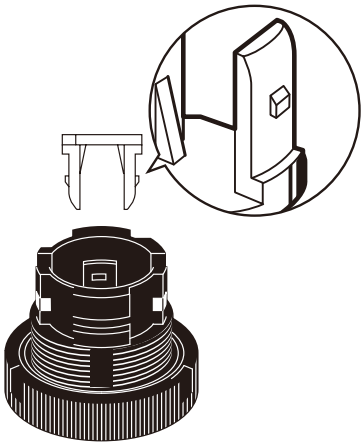
Engraving Method

Material: Acrylic

- Engrave the characters directly on the matted side of the Snap-in Legend Plate.
- The characters must be engraved no deeper than 0.5 mm.
- Apply alcohol-based paint coating to the engraved characters.
- If the Snap-in Legend Plate is transparent, engrave the mirror-written characters on the back of the Snap-in Legend Plate and apply paint coating to the characters. Then apply paint coating of a different color to the remaining part of the Snap-in Legend Plate.

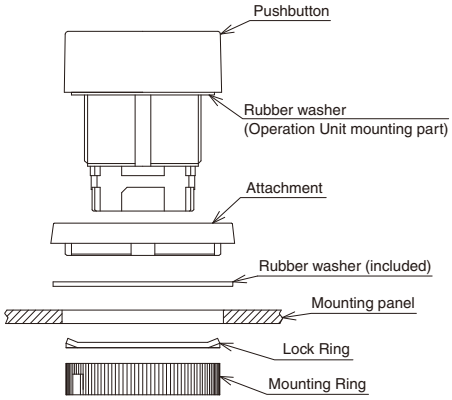
Mounting Three-throw Spacer

Press and secure the two protruding portions of the Three-throw Spacer to the two indented portions of the inner side of the control panel.

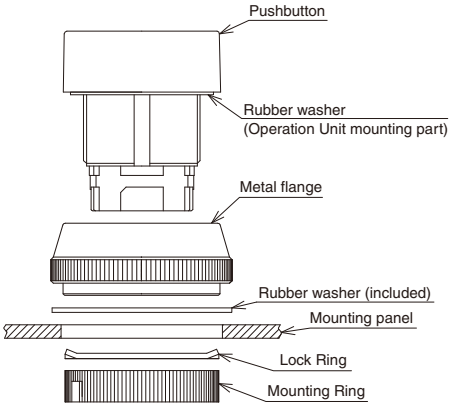


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Mounting the 30-dia. Resin Attachment



Mounting the 30-dia. Metal Flange



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Safety Precautions for All Pushbutton Switches

For the individual precautions for a Switch, refer to the *Safety Precautions* in the section for that Switch.

⚠ WARNING

Do not perform wiring with power supplied to the Switch. Do not touch the terminals or other charged parts of the Switch while power is being supplied. Doing so may result in electric shock.



⚠ Caution

Do not apply a voltage between the incandescent lamp and the terminal that is greater than the rated voltage. Doing so may damage the lamp or LED and cause the Operation Unit to pop out.



Always turn OFF the power and wait for 10 minutes before replacing the incandescent lamp. If the lamp is replaced immediately after the power is turned OFF, the remaining heat may cause burns.



Precautions for Correct Use

For details, refer to the *Precautions for Correct Use* in the *Technical Guide for Pushbutton Switches*.

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Precautions for Correct Use of Pushbutton Switches

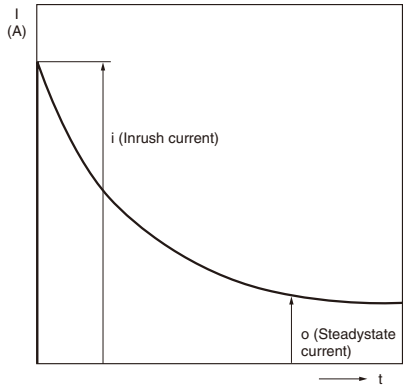
●For the individual precautions for a Switch, refer to the precautions in the section for that Switch.

Electrical Characteristics

1. Operating Load

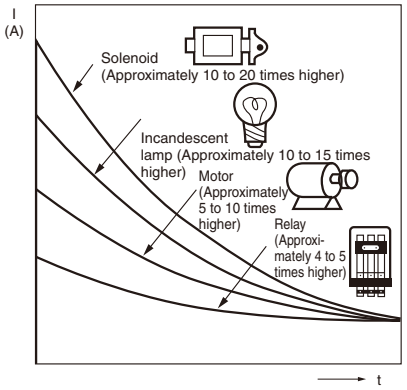
- The switching load capacity of the Switch greatly varies between AC and DC. Always be sure to apply the rated load. The control capacity will drastically drop if it is a DC load. This is because a DC load has no current zero-cross point, unlike an AC load. Therefore, if an arc is generated, it may continue for a comparatively long time. Furthermore, the current direction is always the same, which results in a contact relocation phenomena whereby the contacts easily stick to each other and do not separate when the surfaces of the contacts are uneven.
- Some types of load have a great difference between normal current and inrush current. Make sure that the inrush current is within the permissible value. The greater the inrush current in the closed circuit is, the greater the contact abrasion or shift will be. Consequently, contact weld, contact separation failures, or insulation failures may result. Furthermore, the Switch may be broken or damaged.
- If the load is inductive, counter-electromotive voltage will be generated. The higher the voltage is, the higher the generated energy will be, which will increase the abrasion of the contacts and contact relocation phenomena. Be sure to use the Switch within the rated conditions.

Inrush Current



- Approximate control capacities are given in ratings tables, but these alone are insufficient to guarantee correct operation. For special types of load, with unusual switching voltage or current waveforms, test whether correct operation is possible with the actual load before application.
- When switching for microloads (voltage or current), use a Switch with microload specifications. The reliability of silver-plated contacts, which are used in Switches for standard loads, will be insufficient for microloads.
- When switching microloads or very high loads that are beyond the switching capacity of the Switch, connect a relay suitable for the load.

Type of Load vs. Inrush Current



All the performance ratings given are for operation under the following conditions unless otherwise specified.

Inductive load: A minimum power factor of 0.4 (AC) and a maximum time constant of 7 ms (DC)

Lamp load: An inrush current 10 times higher than the steady-state current

Motor load: An inrush current 6 times higher than the steady-state current

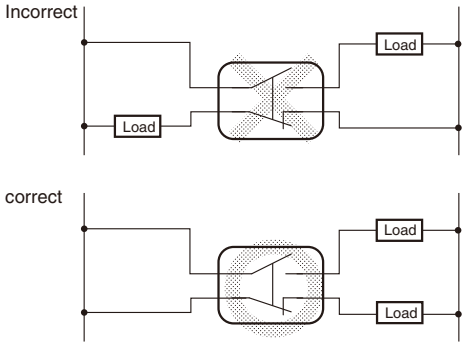
Note: Inductive loads can cause problems especially in DC circuitry. Therefore, it is essential to know the time constants (L/R) of the load.

2. Load Connections

Do not contact a single Switch to two power supplies that are different in polarity or type.

Connection of Different Polarities

The power supply may short-circuit if the loads are connected in the way shown in the "incorrect" example below.

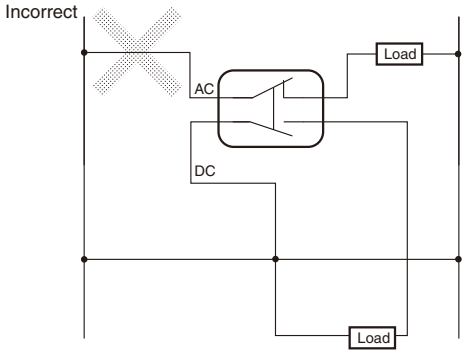


Connect the load to the same polarity.

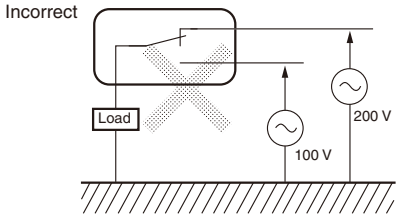
Even in the "correct" example, note that the insulation performance of the switch may deteriorate and the switch life may be shortened because loads are connected to both contacts.

Connection of Different Power Supplies

The DC and AC power may be mixed for the circuit shown below.



Do not design a circuit where voltage is imposed between contacts, otherwise contact weld may result.

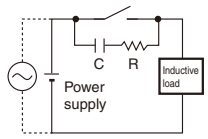
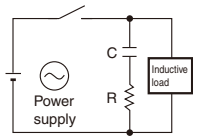
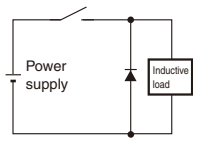
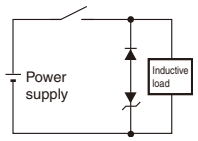
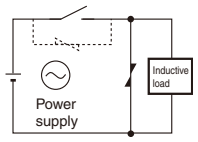


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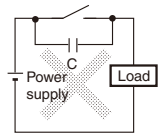
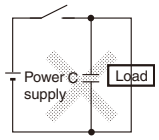
3. Contact Protective Circuit

Apply a contact protective circuit to extend the contact life, prevent noise, and suppress the generation of carbide or nitric acid. Be sure to apply the contact protective circuit correctly, otherwise an adverse effect may occur. The following provides typical examples of contact protective circuits. If the Limit Switch is used in an excessively humid location for switching a load that easily generates arcs, such as an inductive load, the arcs may generate NOx, which will change into HNO_3 if it reacts with moisture. Consequently, the internal metal parts may corrode and the Limit Switch may fail. Be sure to select the ideal contact preventive circuit from the following.

Typical Examples of Contact Protective Circuits

Circuit example		Applicable current		Feature and details	Element selection
		AC	DC		
CR circuit		*	Yes	*When AC is switched, the load impedance must be lower than the CR impedance.	C: 1 to 0.5 μF × switching current (A) R: 0.5 to 1 Ω × switching voltage (V) The values may change according to the characteristics of the load. The capacitor suppresses the spark discharge of current when the contacts are open. The resistor limits the inrush current when the contacts are closed again. Consider the roles of the capacitor and resistor and determine ideal capacitance and resistance values through testing. Basically, use a capacitor with a dielectric strength between 200 and 300 V. When AC is switched, make sure that the capacitor has no polarity.
		Yes	Yes	The operating time will be greater if the load is a relay or solenoid. Connecting the CR circuit in parallel to the load is effective when the power supply voltage is 24 or 48 V and in parallel to the contacts when the power supply voltage is 100 to 200 V.	
Diode method		No	Yes	Energy stored in the coil is changed into current by the diode connected in parallel to the load. Then the current flowing to the coil is consumed and Joule heat is generated by the resistance of the inductive load. The reset time delay with this method is longer than that in the CR method.	The diode must withstand a peak inverse voltage 10 times higher than the circuit voltage and a forward current as high or higher than the load current.
Diode and Zener diode method		No	Yes	This method will be effective if the reset time delay caused by the diode method is too long.	Use a Zener diode with a Zener voltage that is approximately 1.2 × power supply voltage as, depending on the environment, the load may not operate.
Varistor method		Yes	Yes	This method makes use of constant-voltage characteristic of the varistor so that no high-voltage is imposed on the contacts. This method causes a reset time delay. Connecting a varistor in parallel to the load is effective when the supply voltage is 24 to 48 V and in parallel to the contacts when the supply voltage is 100 to 200 V.	---

Do not apply contact protective circuits as shown below.

	This circuit effectively suppresses arcs when the contacts are OFF. The capacitor will be charged, however, when the contacts are OFF. Consequently, when the contacts are ON again, short-circuited current from the capacitance may cause contact weld.		This circuit effectively suppresses arcs when the contacts are OFF. When the contacts are ON again, however, charge current will flow to the capacitor, which may result in contact weld.

Switching a DC inductive load is usually more difficult than switching a resistive load. By using an appropriate contact protective circuit, however, switching a DC inductive load will be as easy as switching a resistive load.

4. Switching

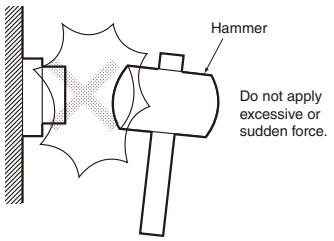
- Do not use the Switch for loads that exceed the rated switching capacity or other contact ratings. Doing so may result in contact weld, contact separation failures, or insulation failures. Furthermore, the Switch may be broken or damaged.
- Do not touch the charged switch terminals while power is supplied, otherwise an electric shock may be received.
- The life of the Switch varies greatly with switching conditions. Before using the Switch, be sure to test the Switch under actual conditions. Make sure that the number of switching operations is within the permissible range. If a deteriorated Switch is used continuously, insulation failures, contact weld, contact failures, switch damage, or switch burnout may result.
- Do not apply excessive or incorrect voltages to the Switch or incorrectly wire the terminals. Otherwise, the Switch may not function properly and have an adverse effect on external circuitry. Furthermore, the Switch itself may become damaged or burnt.
- Do not use the Switch in locations where flammable or explosive gases are present. Otherwise switching arcs or heat radiation may cause a fire or explosion.
- Do not drop or disassemble the Switch, otherwise it may not be capable of full performance. Furthermore, it may be broken or burnt.

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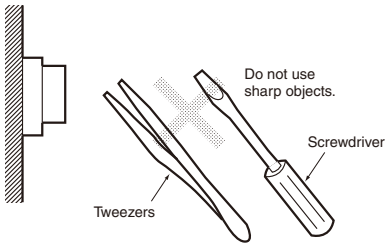
Mechanical Conditions

Operating Force and Operating Method

- Fingertip operation is an important feature of Pushbutton Switches. In terms of Switch operation, Pushbutton Switches differ greatly from detection switches such as Microswitches. Operating the Switch using a hard object (e.g., metal), or with a large or sudden force, may deform or damage the Switch, resulting in faulty or rough operation, or shortening of the Switch life. The strength varies with the size and construction of the Switch. Use the appropriate Switch for the application after confirming the operating method and operating force with this catalog.

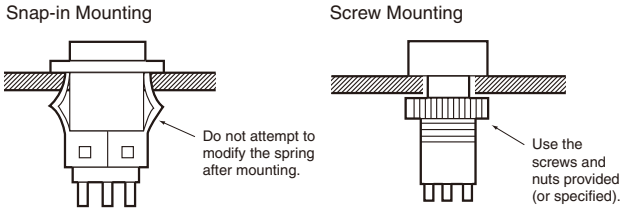


- The pushbutton surface is composed of resin. Therefore, do not attempt to operate the pushbutton using a sharp object, such as a screwdriver or a pair of tweezers. Doing so may damage or deform the pushbutton surface and result in faulty operation.

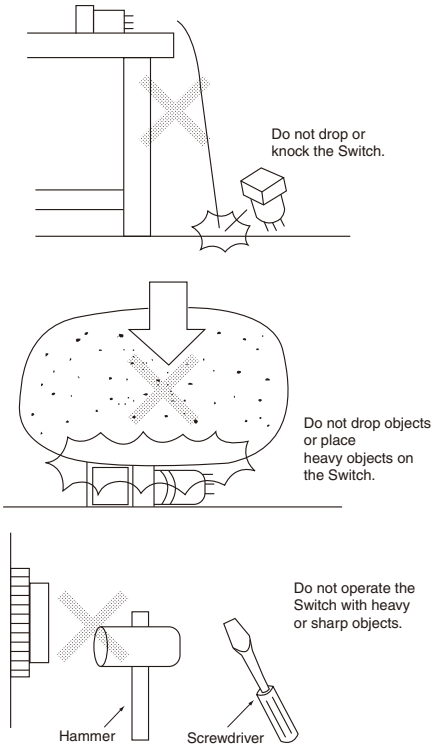


Mounting

- Switches can be broadly divided into two categories according to mounting method: panel-mounting models and PCB-mounting models. Use the appropriate model for the mounting method required. Basically, panel-mounting Switches can withstand a greater operating force than PCB-mounting Switches. If, however, the panel thickness or the panel-cutout dimensions are not suitable for the Switch, it may not be able to withstand the normal operating force. With continuous mounting in particular, select a panel of a thickness that is easily sufficient to withstand the total operating force.
- Panel-mounting Switches can be divided into two categories according to the mounting method: snap-in mounting models and screw-mounting models. Snap-in mounting Switches are held in place with the elasticity of resin or a metal leaf spring. Do not attempt to modify the spring after mounting. Doing so may result in faulty operation or damage the mounting structure. Mount screw-mounting models using the screws and nuts provided (or individually specified). Tighten the screws to the specified torque. Mounting with different screws or nuts, or tightening beyond the specified torque may result in distortion of the inside of the case or damage to the screw section.



- Subjecting the Switch to severe vibrations or shock may result in faulty operation or damage. Also, many of the Switches are composed of resin so contact with sharp objects may result in damage to the surface. This kind of damage may spoil the appearance of the Switch or result in faulty operation. Do not throw or drop the Switch.

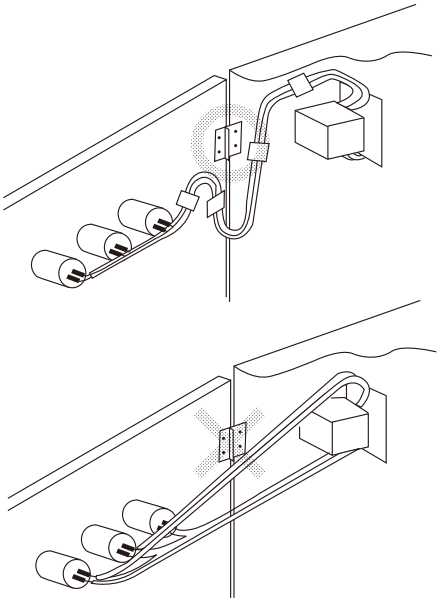


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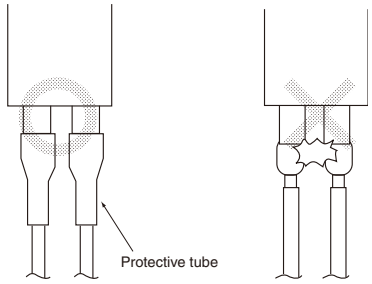
Mounting Precautions

Wiring

- Perform wiring so that the lead wires will not be caught on other objects as this will cause stress on the Switch terminals. Wire the Switch so that there is slack in the lead wires and fix lead wires at intermediate points. If the panel to which the Switch is mounted needs to be opened and closed for maintenance purposes, perform wiring so that the opening and closing of the panel will not interfere with the wiring.



- With miniature Switches, the gap between the terminals is very narrow. Use protective or heat-absorbing tubes to prevent burning of the wire sheath or shorting.



Soldering

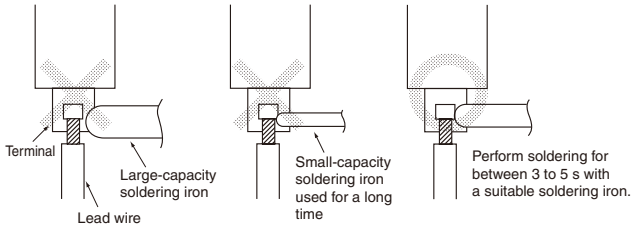
- There are two methods for soldering the Switch: hand soldering and automatic soldering. In addition, automatic soldering itself can be divided into two types : dip soldering and reflow soldering. Use the soldering method appropriate for the mounting method.

Typical Soldering Example

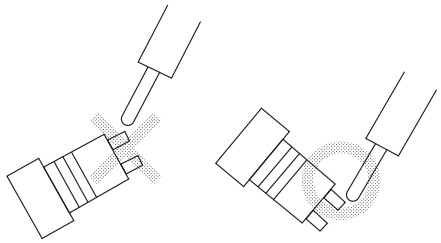
Method		Soldering device	Application
Hand soldering		Soldering iron	Small quantities Different materials Lead wire terminals
Automatic soldering	Dip soldering	Jet soldering bath Dip soldering bath	Large quantities of discrete terminals
	Reflow soldering	Infrared reflow (IR) soldering bath Vapor-phase (VPS) reflow soldering bath	Large quantities of miniature SMD terminals

- Do not use soldering flux that contains chlorine. Doing so may result in metal corrosion.

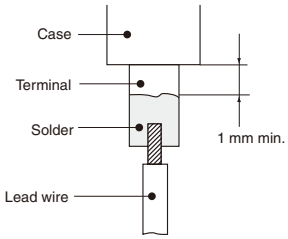
- Perform hand soldering using the appropriate soldering iron.



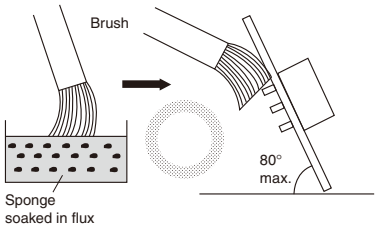
- With the exception of PCB-mounting Switches, when performing hand soldering, hold the Switch so that the terminals point downwards so that flux does not get inside the Switch.

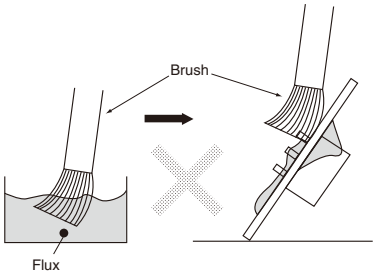


- Leave a gap of at least 1 mm between the soldered parts and the surface of the case so that flux does not get inside the Switch.



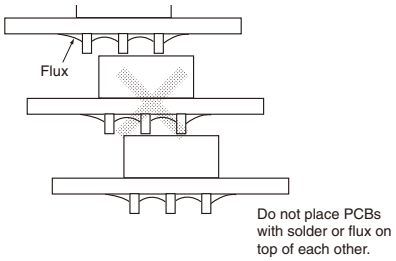
- When applying flux using a brush, use a sponge soaked in flux as shown below. Do not apply more than is necessary. Also, apply the flux with the PCB inclined at an angle of less than 80° so that flux does not flow onto the mounting surface of the Switch.



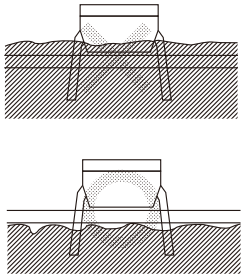


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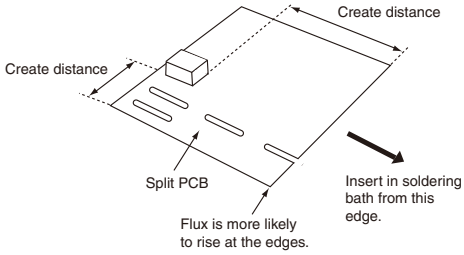
- Do not place PCBs that have had flux applied or have been soldered on top of each other. Otherwise, the flux on the PCBs solder surface may stain the upper part of the Switch or even permeate the inside of the Switch and cause contact failure. Be sure to insert a special PCB stocker.



- When performing soldering with a dip soldering bath, ensure that the flux does not reach a higher level than the PCB.

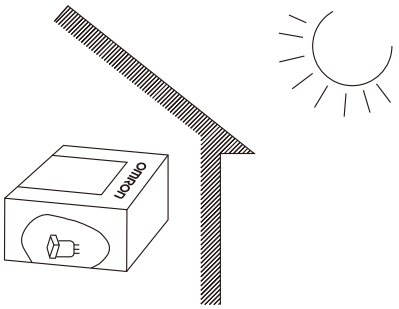


- Flux is especially likely to rise up at the edges of the PCB. If the Switch is mounted near the edge of the PCB, create a gap between the edge by using a split PCB, and insert the PCB in the soldering bath so that the edge that is farthest from the Switch enters the bath first.



Storage

- When the Switch is left unused or stored for long periods, the ambient conditions can have a great effect on the condition of the Switch. In certain environments, leaving the Switch exposed may result in deterioration (i.e., oxidation, or the creation of an oxide film) of the contacts and terminals, causing the contact resistance to increase, and making it difficult to solder the lead wires. Therefore, store in a well-ventilated room, inside, for example, a non-hygroscopic case, in a location where no corrosive gases are present.



- If the Switch is stored in a location where it will be exposed to direct light, colored resin in the colored plate may fade. Therefore, do not store the Switch in locations where it will be exposed to direct light.

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