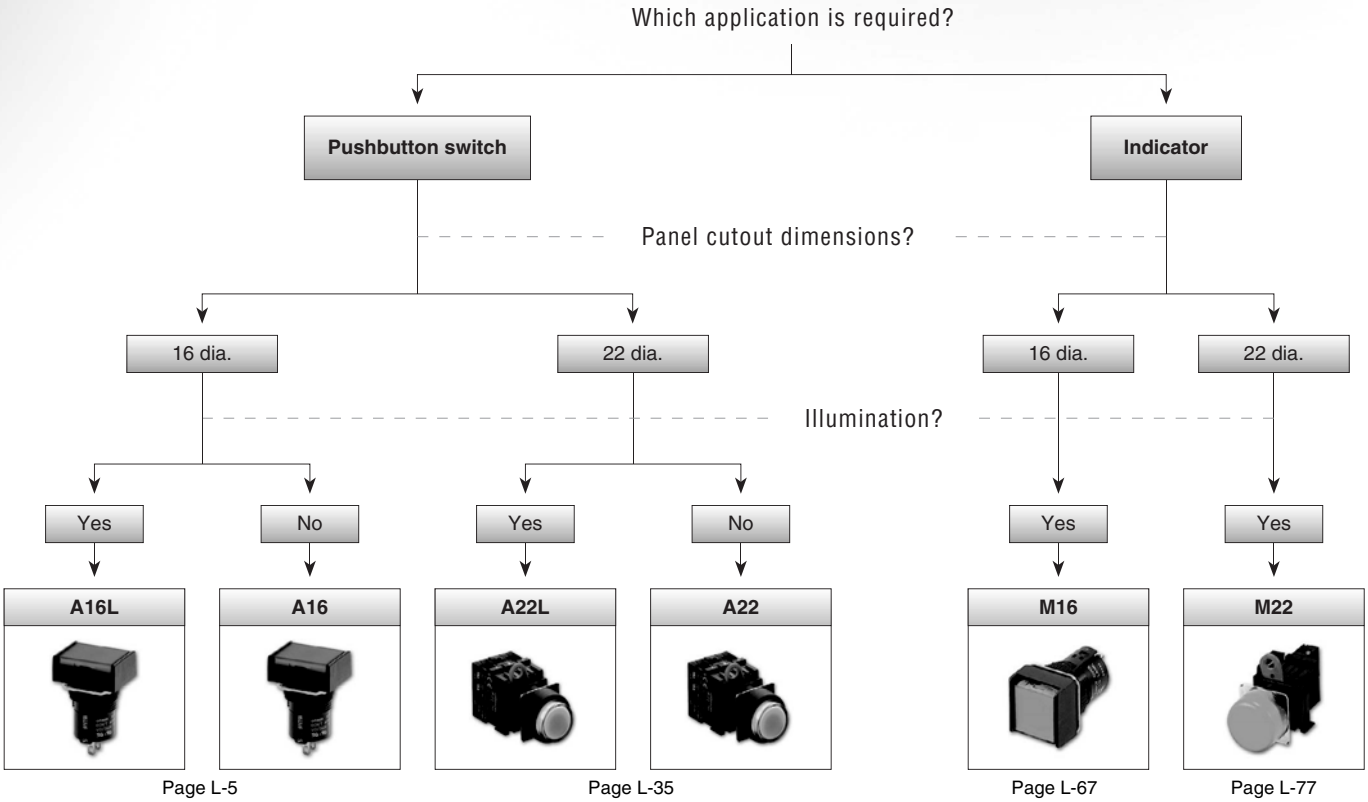
Pushbutton switches

Our pushbutton switches include models from 16 mm to 22 mm in diameter. Available in different varieties of shapes, sizes, colours and functions, this pushbutton switch range allows you to select the right product for your application.

Omron's pushbutton switches feature:

- Range of installation diameters 16 to 22 mm
- Versions with safety standard IP40 and IP65, oil-tight
- Very low installation depth: only 28.5 mm
- 1 or 2 SPDTs
- Variety of shapes: rectangular, square, round
- Illuminated and non-illuminated variants



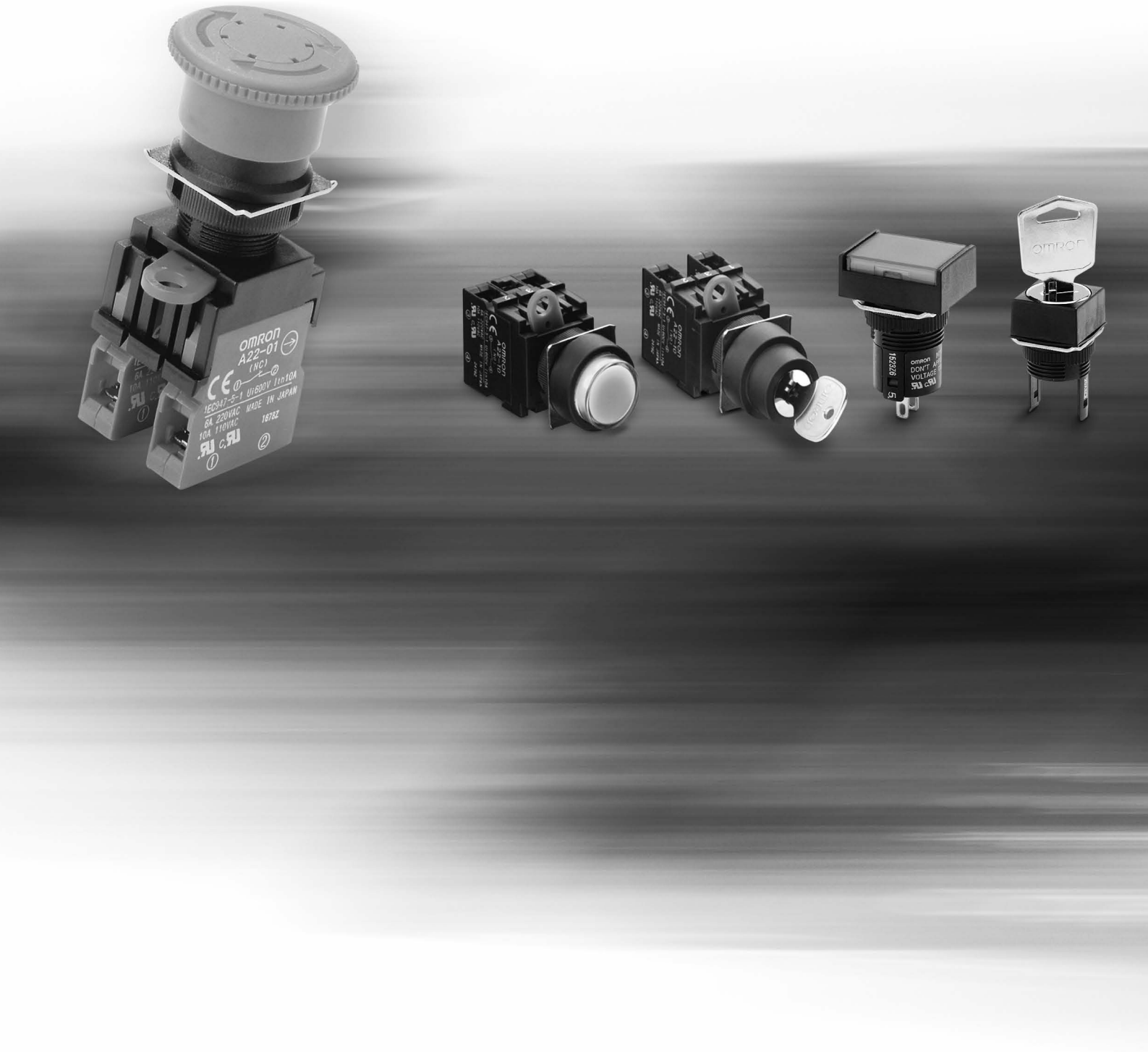


Table of contents

Selection table

Type		Pushbutton switches			Key-type selector switch	
Selection criteria						
	Model	A16	A16□-P	A22	A165K	A22K
	Mounting	Nut mounting				
	Size	16 mm	16 mm	22 mm	16 mm	22 mm
	Shape	▭ □ ○	▭	▭ □ ○	▭ □ ○	▭ □ ○
Pushbutton colour – Incandescent lamp-lighted	Red	■	■	■		
	Yellow	■	■	■		
	Pure yellow	■	■			
	Green	■	■	■		
	White	■	■	■		
	Blue	■	■	■		
	Orange					
Pushbutton colour – LED-lighted	Red	■	■	■		
	Yellow	■	■	■		
	Pure yellow	■	■			
	Green	■	■	■		
	White	■	■	■		
	Blue	■	■	■		
Pushbutton colour – Non-lighted	Red			■		
	Yellow			■		
	Green			■		
	White			■		
	Blue			■		
Pushbutton colour	Black	■	■	■	■	■
Features	Momentary operation	■	■			■
	Self-holding	■	■			■
	Number of contacts	2	2	6	2	6
	IP rating	IP40 / IP65	IP40 / IP65	IP65	IP65	IP65
	Buzzer					
	Legend plate	■		■	■	■
	Reset method - manual	■	■		■	■
	Reset method - automatic		■		■	
Switch ratings [A]	125 VAC	5	5	10	5	10
	250 VAC	3	3	6	3	6
	30 VDC	3	3	10	3	10
Terminals	Solder	■			■	
	PCB		■		■	
	Screw-less Clamp					
Operating voltage	5 VDC		■	■	■	
	12 VDC		■	■	■	
	24 VDC		■	■	■	
Form	SPDT		■		■	
	DPDT		■		■	
	2 notches		■		■	■
	3 notches				■	■
	SPST-NO			■		■
	SPST-NC			■		■
	SPST-NO + SPST-NC			■		■
	DPST-NO			■		■
	DPST-NC			■		■
	Page	L-5	CD	L-35	CD	CD

Selection criteria		Type	Knob-type selector switch		Indicator	
						
		Model	A165S / W	A22S / W	M16	M22
		Mounting	Nut mounting			
		Size	16 mm	22 mm	16 mm	22 mm
		Shape	▭ □ ○	▭ □ ○	▭ □ ○	▭ □ ○
Pushbutton colour	Incandescent lamp-lighted	Red		■	■	■
		Yellow		■	■	■
		Pure yellow			■	
		Green		■	■	■
		White			■	■
		Blue		■	■	■
		Orange				
	LED-lighted	Red	■	■	■	■
		Yellow	■	■	■	■
		Pure yellow			■	
		Green	■	■	■	■
		White			■	■
		Blue		■	■	■
	Non-lighted	Red				
		Yellow				
		Green				
		White				
		Blue				
		Black		■		
Features		Momentary operation	■	■		
		Self-holding	■	■		
		Number of contacts	2	6		
		IP rating	IP65	IP65	IP40 / IP65	IP65
		Buzzer				
		Legend plate	■	■	■	■
		Reset method - manual		■		
		Reset method - automatic				
Switch ratings [A]		125 VAC	5	10		
		250 VAC	3	6		
		30 VDC	3	10		
Terminals		Solder	■		■	
		PCB	■		■	
		Screw-less Clamp			■	
Operating voltage		5 VDC	■		■	■
		12 VDC	■		■	■
		24 VDC	■		■	■
Form		SPDT	■			
		DPDT	■			
		2 notches	■	■		
		3 notches	■	■		
		SPST-NO		■		
		SPST-NC		■		
		SPST-NO + SPST-NC		■		
		DPST-NO		■		
		DPST-NC		■		
		Page	CD	CD	L-67	L-77

■ Standard □ Available ▭ No / not available

LEADING IN SERVICE

Focussed, progressive, distinctive. Be assured, choose Omron

At Omron we set high standards for ourselves. Our products are known all over the world for their unrivalled quality. But we offer more than just excellent quality. In an environment that places ever greater demands with regard to service, quality and costeffectiveness, other things are important too. Providing a top-quality service is what we do every day, including extra service as standard. This helps to ensure that we can provide tailor-made solutions for applications more effectively and more quickly.

More and more companies are choosing Omron as they seek to work in a partnership that is based on reliability and certainty.

Omron – the reassuring choice.

International standards and approvals

Our products carry all relevant international standards and approvals, including CCC (Chinese Compulsory Certification), which makes exporting your system much easier.

- Reliability, also for your customers
- Maximum flexibility
- Confidence

5-day repair service

More and more people are choosing Omron, as a high degree of reliability is a key feature of its products. You can always rely on Omron. Even if a product unexpectedly malfunctions, our repair team is ready to swing into action.

- Product repaired and returned to you within 5 days, including collection and delivery
- You can track the status of your repair on-line
- Repairs within warranty are completely free-of-charge

For more information please visit the Service & Support section at http://omron-industrial.com

EPLAN for Omron products

The majority of standard Omron products are provided in digital EPLAN format, which means that a few clicks of your mouse are all that is needed to design the right product into your switching panel.

For more information please visit: http://omron-industrial.com/en/eplan/

- Very easy to use
- Always the right product
- Reduced engineering time

Downloadable 2-D and 3-D CAD drawings

Designers of switching panels and machines can download clear 2-D and 3-D CAD drawings for all current products from http://omron-industrial.com/en/2D3D, which can easily be incorporated into your design.

- Large number of formats supported for greater flexibility
- Readily available
- Convenience that saves you time

Pushbutton Switch
A16

Mounting Aperture of 16 mm

- Modular construction (Pushbutton + Case + Lamp + Switch)
- Wide Variety of Control and Signal Devices: Lighted, Non-Lighted, and Buzzer
- UL and cUL approved.
- Conforms to EN60947-5-1, IEC947-5-1
- Quick and easy assembly, snap-in Switch.
- Wide range of switching capacity from standard to microload
- High reliability, IP65
- Short mounting depth, less than 28.5 mm below panel

Model Number Structure

■ Model Number Legend

Completely Assembled

The model numbers used to order sets of Units are illustrated below. One set comprises the Pushbutton, Lamp (lighted models only), Case, and Switch.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
A16	5	L	J	R	M	24D	2

(1) Degree of Protection

Symbol	Protection
No symbol	IP40
5	IP65 oil-resistant

(2) Lighted/Non-lighted

Symbol	Type
No symbol	Non-lighted
L	Lighted

(3) Shape of Pushbutton

Symbol	Shape	
J	Rectangular	2-way guard
A	Square	2-way guard
T	Round	Projecting model
3J	Rectangular	3-way guard
BA	Square	24-mm square

(4) Color of Pushbutton

Symbol	Color
R	Red
Y	Yellow
PY	Pure yellow
G	Green
W	White
A	Blue
B	Black (non-lighted models only)

"Colored-illumination" models operate in the way shown below:

Unlit	Lit
White	Color

The built-in LED is colored.

(5) Switch Operation

Symbol	Operation
M	Momentary
A	Alternate

Momentary-action: Self-resetting
Alternate-action: Self-holding

(6) Light Source

Symbol	Type	Operating voltage	Rated voltage
No symbol	Non-lighted		
5	Incandescent lamp	5 VAC/VDC	6 VAC/VDC
12		12 VAC/VDC	14 VAC/VDC
24		24 VAC/VDC	28 VAC/VDC
5D	LED	5 ±5% VDC	5 VDC
12D		12 ±5% VDC	12 VDC
24D		24 ±5% VDC	24 VDC

Voltage Reduction Unit (24-V Built-in LED)

Symbol	Type	Operating voltage	Rated voltage
T1	LED	90 to 121 VAC/VDC	110 VAC
T2		180 to 242 VAC/VDC	220 VAC

(7) Contact Configuration

Symbol	Type	Terminal
1	SPDT	Solder Terminal
2	DPDT	
1P	SPDT	PCB Terminal
2P	DPDT	
2S	DPDT	Screw-Less Clamp

Only DPDT contacts are available with Screw-Less Clamp.

Note: 1. Solder terminals are available only with 100-V models.
2. The Voltage Reduction Unit is not available for models with PCB terminals.

Neon lamps are not available with models that are ordered as a set. They must be ordered individually if required. Refer to page L-13.

Model	Lighted Pushbutton Switches	Non-lighted Pushbutton Switches
Pushbutton	Rectangular  Square  Round 	Rectangular  Square  Round 
Lamp	LED lamp  Incandescent lamp  Neon lamp 	
Case		
Switch	Solder Terminals (Without Voltage Reduction Unit) 	

Note: There is no Lamp with non-lighted models.

Subassembled

1. Pushbutton

Non-lighted/Lighted

A16□L-□□
1 2 3

1. Degree of Protection
None: IP40
5: IP65

2. Flange Shape
J: Rectangular
T: Round
A: Square

3. Illumination Color for Non-lighted Models
R: Red
G: Green
Y: Yellow
W: White
A: Blue
B: Black

Illumination Color for Lighted Models
LED/Incandescent Lamp
R: Red
Y: Yellow
PY: Pure yellow
W: White
A: Blue
LED
GY: Green
Incandescent Lamp
G: Green
Neon Lamp
RN: Red
GN: Green

2. Lamp

A16-□□
1 2

1. Operating Voltage (Rated Voltage)
Incandescent Lamp
5: 5 VAC/VDC (6 VAC/VDC)
12: 12 VAC/VDC (14 VAC/VDC)
24: 24 VAC/VDC (28 VAC/VDC)
LED
5DS: 5 VDC (5 VDC)
12DS: 12 VDC (12 VDC)
24DS: 24 VDC (24 VDC)
Neon Lamp
1N: 100 VAC (110 VAC)
2N: 200 VAC (220 VAC)

2. Illumination Color
None: Incandescent Lamp
R: Red (LED)
G: Green (LED)
Y: Yellow (LED)
W: White (LED)
A: Blue (LED)
RN: Red (Neon Lamp)
GN: Green (Neon Lamp)

3. Case

A16□-□□
1 2 3

1. Degree of Protection
None: IP40
5: IP65 Oil-resistant

2. Flange Shape
CJ: Rectangular
CT: Round
CA: Square
3. Switch Action
M: Momentary
A: Alternate

4. Switch (Solder Terminals)

A16-□-□
1 2

1. Voltage Reduction Circuit (Operating Voltage/Rated Voltage)
None: Without Voltage Reduction Unit
T1: 100 VAC/110 VAC

2. Contacts
1: SPDT
2: DPDT

5. Socket (Solder Terminals Only)

M16-□
1

1. Voltage Reduction Circuit (Operating Voltage/Rated Voltage)
0: Without Voltage Reduction Unit
T1: 100 VAC/110 VAC

Ordering Information

■ List of Models

Ordering as a Set

The model numbers used to order sets of Units are given in the following tables. One set comprises the Pushbutton, Lamp (lighted models only), Case, and Switch.

A16□-J (Rectangular) Models

Solder Terminal Models

IP40

Output	Lighting	Operating voltage	Momentary operation (Self-resetting)	Alternate operation (Self-holding)	Pushbutton color symbol (See note 1.)
SPDT	LED without Voltage Reduction Unit	5 VDC	A16L-J□M-5D-1	A16L-J□A-5D-1	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A16L-J□M-12D-1	A16L-J□A-12D-1	
		24 VDC	A16L-J□M-24D-1	A16L-J□A-24D-1	
	Incandescent lamp	5 VDC/VAC	A16L-J□M-5-1	A16L-J□A-5-1	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A16L-J□M-12-1	A16L-J□A-12-1	
		24 VDC/VAC	A16L-J□M-24-1	A16L-J□A-24-1	
	Non-lighted		A16-J□M-1	A16-J□A-1	
DPDT	LED without Voltage Reduction Unit	5 VDC	A16L-J□M-5D-2	A16L-J□A-5D-2	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A16L-J□M-12D-2	A16L-J□A-12D-2	
		24 VDC	A16L-J□M-24D-2	A16L-J□A-24D-2	
	Incandescent lamp	5 VDC/VAC	A16L-J□M-5-2	A16L-J□A-5-2	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A16L-J□M-12-2	A16L-J□A-12-2	
		24 VDC/VAC	A16L-J□M-24-2	A16L-J□A-24-2	
	Non-lighted		A16-J□M-2	A16-J□A-2	

IP65 Oil-resistant

Output	Lighting	Operating voltage	Momentary operation (Self-resetting)	Alternate operation (Self-holding)	Pushbutton color symbol (See note 1.)
SPDT	LED without Voltage Reduction Unit	5 VDC	A165L-J□M-5D-1	A165L-J□A-5D-1	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A165L-J□M-12D-1	A165L-J□A-12D-1	
		24 VDC	A165L-J□M-24D-1	A165L-J□A-24D-1	
	Incandescent lamp	5 VDC/VAC	A165L-J□M-5-1	A165L-J□A-5-1	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A165L-J□M-12-1	A165L-J□A-12-1	
		24 VDC/VAC	A165L-J□M-24-1	A165L-J□A-24-1	
	Non-lighted		A165-J□M-1	A165-J□A-1	
DPDT	LED without Voltage Reduction Unit	5 VDC	A165L-J□M-5D-2	A165L-J□A-5D-2	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A165L-J□M-12D-2	A165L-J□A-12D-2	
		24 VDC	A165L-J□M-24D-2	A165L-J□A-24D-2	
	Incandescent lamp	5 VDC/VAC	A165L-J□M-5-2	A165L-J□A-5-2	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A165L-J□M-12-2	A165L-J□A-12-2	
		24 VDC/VAC	A165L-J□M-24-2	A165L-J□A-24-2	
	Non-lighted		A165-J□M-2	A165-J□A-2	

Note: 1. Enter the desired color symbol for the Pushbutton in the □.

2. Black (“B”) Pushbuttons are only available for non-lighted models.

A16□-A (Square) Models

Solder Terminal Models

IP40

Output	Lighting	Operating voltage	Momentary operation (Self-resetting)	Alternate operation (Self-holding)	Pushbutton color symbol (See note 1.)
SPDT	LED without Voltage Reduction Unit	5 VDC	A16L-A□M-5D-1	A16L-A□A-5D-1	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A16L-A□M-12D-1	A16L-A□A-12D-1	
		24 VDC	A16L-A□M-24D-1	A16L-A□A-24D-1	
	Incandescent lamp	5 VDC/VAC	A16L-A□M-5-1	A16L-A□A-5-1	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A16L-A□M-12-1	A16L-A□A-12-1	
		24 VDC/VAC	A16L-A□M-24-1	A16L-A□A-24-1	
	Non-lighted		A16-A□M-1	A16-A□A-1	
DPDT	LED without Voltage Reduction Unit	5 VDC	A16L-A□M-5D-2	A16L-A□A-5D-2	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A16L-A□M-12D-2	A16L-A□A-12D-2	
		24 VDC	A16L-A□M-24D-2	A16L-A□A-24D-2	
	Incandescent lamp	5 VDC/VAC	A16L-A□M-5-2	A16L-A□A-5-2	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A16L-A□M-12-2	A16L-A□A-12-2	
		24 VDC/VAC	A16L-A□M-24-2	A16L-A□A-24-2	
	Non-lighted		A16-A□M-2	A16-A□A-2	

IP65 Oil-resistant

Output	Lighting	Operating voltage	Momentary operation (Self-resetting)	Alternate operation (Self-holding)	Pushbutton color symbol (See note 1.)
SPDT	LED without Voltage Reduction Unit	5 VDC	A165L-A□M-5D-1	A165L-A□A-5D-1	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A165L-A□M-12D-1	A165L-A□A-12D-1	
		24 VDC	A165L-A□M-24D-1	A165L-A□A-24D-1	
	Incandescent lamp	5 VDC/VAC	A165L-A□M-5-1	A165L-A□A-5-1	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A165L-A□M-12-1	A165L-A□A-12-1	
		24 VDC/VAC	A165L-A□M-24-1	A165L-A□A-24-1	
	Non-lighted		A165-A□M-1	A165-A□A-1	
DPDT	LED without Voltage Reduction Unit	5 VDC	A165L-A□M-5D-2	A165L-A□A-5D-2	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A165L-A□M-12D-2	A165L-A□A-12D-2	
		24 VDC	A165L-A□M-24D-2	A165L-A□A-24D-2	
	Incandescent lamp	5 VDC/VAC	A165L-A□M-5-2	A165L-A□A-5-2	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A165L-A□M-12-2	A165L-A□A-12-2	
		24 VDC/VAC	A165L-A□M-24-2	A165L-A□A-24-2	
	Non-lighted		A165-A□M-2	A165-A□A-2	

Note: 1. Enter the desired color symbol for the Pushbutton in the □.

2. Black (“B”) Pushbuttons are only available for non-lighted models.

A16□-T (Round) Models

Solder Terminals

IP40

Output	Lighting	Operating voltage	Momentary operation (Self-resetting)	Alternate operation (Self-holding)	Pushbutton color symbol (See note 1.)
SPDT	LED without Voltage Reduction Unit	5 VDC	A16L-T□M-5D-1	A16L-T□A-5D-1	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A16L-T□M-12D-1	A16L-T□A-12D-1	
		24 VDC	A16L-T□M-24D-1	A16L-T□A-24D-1	
	Incandescent lamp	5 VDC/VAC	A16L-T□M-5-1	A16L-T□A-5-1	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A16L-T□M-12-1	A16L-T□A-12-1	
		24 VDC/VAC	A16L-T□M-24-1	A16L-T□A-24-1	
	Non-lighted		A16-T□M-1	A16-T□A-1	
DPDT	LED without Voltage Reduction Unit	5 VDC	A16L-T□M-5D-2	A16L-T□A-5D-2	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A16L-T□M-12D-2	A16L-T□A-12D-2	
		24 VDC	A16L-T□M-24D-2	A16L-T□A-24D-2	
	Incandescent lamp	5 VDC/VAC	A16L-T□M-5-2	A16L-T□A-5-2	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A16L-T□M-12-2	A16L-T□A-12-2	
		24 VDC/VAC	A16L-T□M-24-2	A16L-T□A-24-2	
	Non-lighted		A16-T□M-2	A16-T□A-2	

IP65 Oil-resistant

Output	Lighting	Operating voltage	Momentary operation (Self-resetting)	Alternate operation (Self-holding)	Pushbutton color symbol (See note 1.)
SPDT	LED without Voltage Reduction Unit	5 VDC	A165L-T□M-5D-1	A165L-T□A-5D-1	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A165L-T□M-12D-1	A165L-T□A-12D-1	
		24 VDC	A165L-T□M-24D-1	A165L-T□A-24D-1	
	Incandescent lamp	5 VDC/VAC	A165L-T□M-5-1	A165L-T□A-5-1	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A165L-T□M-12-1	A165L-T□A-12-1	
		24 VDC/VAC	A165L-T□M-24-1	A165L-T□A-24-1	
	Non-lighted		A165-T□M-1	A165-T□A-1	
DPDT	LED without Voltage Reduction Unit	5 VDC	A165L-T□M-5D-2	A165L-T□A-5D-2	R: red Y: yellow PY: pure yellow G: green A: blue W: white
		12 VDC	A165L-T□M-12D-2	A165L-T□A-12D-2	
		24 VDC	A165L-T□M-24D-2	A165L-T□A-24D-2	
	Incandescent lamp	5 VDC/VAC	A165L-T□M-5-2	A165L-T□A-5-2	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC/VAC	A165L-T□M-12-2	A165L-T□A-12-2	
		24 VDC/VAC	A165L-T□M-24-2	A165L-T□A-24-2	
	Non-lighted		A165-T□M-2	A165-T□A-2	

Note: 1. Enter the desired color symbol for the Pushbutton in the □.

2. Black (“B”) Pushbuttons are only available for non-lighted models.

Other Models

Models with Reduced-voltage Lighting and Solder Terminals

IP40

Output	Lighting	Operating voltage	Momentary operation (Self-resetting)	Alternate operation (Self-holding)	Pushbutton color symbol (See note 1.)
SPDT	LED (with built-in reduced-voltage lighting function)	100/110 VAC/VDC	A16L-Δ□M-T1-1	A16L-Δ□A-T1-1	R: red Y: yellow PY: pure yellow G: green W: white A: blue
DPDT		100/110 VAC/VDC	A16L-Δ□M-T1-2	A16L-Δ□A-T1-2	

IP65

Output	Lighting	Operating voltage	Momentary operation (Self-resetting)	Alternate operation (Self-holding)	Pushbutton color symbol (See note 1.)
SPDT	LED (with built-in reduced-voltage lighting function)	100/110 VAC/VDC	A165L-Δ□M-T1-1	A165L-Δ□A-T1-1	R: red Y: yellow PY: pure yellow G: green W: white A: blue
DPDT		100/110 VAC/VDC	A165L-Δ□M-T1-2	A165L-Δ□A-T1-2	

Note: 1. Enter the desired shape for the Pushbutton in Δ: J (rectangular), A (square), or T (round). Enter the desired color symbol for the Pushbutton in the □.

2. Models with rated voltage 200 to 220 VAC/VDC (T2 models) are only available with Screw-Less Clamps.

Screw-Less Clamp Models

IP40

Output	Lighting	Operating voltage	Momentary operation (Self-resetting)	Alternate operation (Self-holding)	Pushbutton color symbol (See note 1.)
DPDT	LED	5 VDC	A16L-Δ□M-5D-2S	A16L-Δ□A-5D-2S	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC	A16L-Δ□M-12D-2S	A16L-Δ□A-12D-2S	
		24 VDC	A16L-Δ□M-24D-2S	A16L-Δ□A-24D-2S	
	LED (with built-in reduced-voltage lighting function)	100/110 VAC/VDC	A16L-Δ□M-T1-2S	A16L-Δ□A-T1-2S	
		200/220 VAC/VDC	A16L-Δ□M-T2-2S	A16L-Δ□A-T2-2S	
	Non-lighted		A16-Δ□M-2S	A16-Δ□A-2S	

IP65

Output	Lighting	Operating voltage	Momentary operation (Self-resetting)	Alternate operation (Self-holding)	Pushbutton color symbol (See note 1.)
DPDT	LED	5 VDC	A165L-Δ□M-5D-2S	A165L-Δ□A-5D-2S	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
		12 VDC	A165L-Δ□M-12D-2S	A165L-Δ□A-12D-2S	
		24 VDC	A165L-Δ□M-24D-2S	A165L-Δ□A-24D-2S	
	LED (with built-in reduced-voltage lighting function)	100/110 VAC/VDC	A165L-Δ□M-T1-2S	A165L-Δ□A-T1-2S	
		200/220 VAC/VDC	A165L-Δ□M-T2-2S	A165L-Δ□A-T2-2S	
	Non-lighted		A165-Δ□M-2S	A165-Δ□A-2S	

Note: 1. Enter the desired shape for the Pushbutton in Δ: J (rectangular), A (square), or T (round). Enter the desired color symbol for the Pushbutton in the □.

2. Black (“B”) Pushbuttons are only available for non-lighted models.

A165□-BA (24-mm Square) Models

Solder Terminals

IP65

Output	Lighting	Operating voltage	Momentary operation (Self-resetting)	Alternate operation (Self-holding)	Pushbutton color symbol (See note 1.)
SPDT	LED	5 VDC	A165L-BA□M-5D-1	A165L-BA□A-5D-1	R: red Y: yellow PY: pure yellow G: green W: white A: blue B: black (See note 2.)
	LED	12 VDC	A165L-BA□M-12D-1	A165L-BA□A-12D-1	
	LED	24 VDC	A165L-BA□M-24D-1	A165L-BA□A-24D-1	
	Non-lighted		A165-BA□M-1	A165-BA□A-1	
DPDT	LED	5 VDC	A165L-BA□M-5D-2	A165L-BA□A-5D-2	
	LED	12 VDC	A165L-BA□M-12D-2	A165L-BA□A-12D-2	
	LED	24 VDC	A165L-BA□M-24D-2	A165L-BA□A-24D-2	
	Non-lighted		A165-BA□M-2	A165-BA□A-2	

Note: 1. Enter the desired color symbol for the Pushbutton in the □.

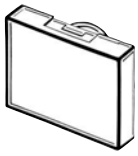
2. Black (“B”) Pushbuttons are only available for non-lighted models.

Ordering Individually

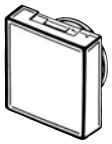
Pushbuttons, Lamps, Cases, and Switches (Sockets) can be ordered separately. Combinations that are not available as sets can be created using individual Units. Also, store the parts as spares for maintenance and repairs.

Pushbutton

Rectangular Models



Square Models



Round Models

Note: Use IP40 Pushbuttons with IP40 Switches and use IP65 Pushbuttons with IP65 Switches. There is no Legend Plate built into the Pushbutton

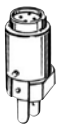
Case

Lighted Models

Non-lighted Models

Lamp

LED

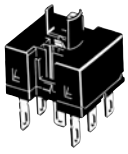


Incandescent lamp

Neon lamp

Socket

Solder terminals (no transformer)



Lighted/non-lighted

Pushbuttons

Illumination: red, yellow, and white use either LED or incandescent lamps.

LED

Degree of protection	IP40			Oil-resistant IP65		
Color	Rectangular 	Square 	Round 	Rectangular 	Square 	Round 
Red	A16L-JR	A16L-AR	A16L-TR	A165L-JR	A165L-AR	A165L-TR
Yellow	A16L-JY	A16L-AY	A16L-TY	A165L-JY	A165L-AY	A165L-TY
Pure yellow	A16L-JPY	A16L-APY	A16L-TPY	A165L-JPY	A165L-APY	A165L-TPY
Green	A16L-JGY	A16L-AGY	A16L-TGY	A165L-TGY	A165L-AGY	A165L-TGY
White	A16L-JW	A16L-AW	A16L-TW	A165L-TW	A165L-AW	A165L-TW
Blue	A16L-JA	A16L-AA	A16L-TA	A165L-JA	A165L-AA	A165L-TA

Incandescent Lamps (With the exception of green, the Units are the same as for LEDs.)

Degree of protection	IP40			Oil-resistant IP65		
Color	Rectangular 	Square 	Round 	Rectangular 	Square 	Round 
Red	A16L-JR	A16L-AR	A16L-TR	A165L-JR	A165L-AR	A165L-TR
Yellow	A16L-JY	A16L-AY	A16L-TY	A165L-JY	A165L-AY	A165L-TY
Pure yellow	A16L-JPY	A16L-APY	A16L-TPY	A165L-JPY	A165L-APY	A165L-TPY
Green	A16L-JG	A16L-AG	A16L-TG	A165L-JG	A165L-AG	A165L-TG
White	A16L-JW	A16L-AW	A16L-TW	A165L-JW	A165L-AW	A165L-TW
Blue	A16L-JA	A16L-AA	A16L-TA	A165L-JA	A165L-AA	A165L-TA

Non-lighted (Same as Units for incandescent lamps.)

Degree of protection	IP40			Oil-resistant IP65		
Color	Rectangular 	Square 	Round 	Rectangular 	Square 	Round 
Red	A16L-JR	A16L-AR	A16L-TR	A165L-JR	A165L-AR	A165L-TR
Yellow	A16L-JY	A16L-AY	A16L-TY	A165L-JY	A165L-AY	A165L-TY
Pure yellow	A16L-JPY	A16L-APY	A16L-TPY	A165L-JPY	A165L-APY	A165L-TPY
Green	A16L-JG	A16L-AG	A16L-TG	A165L-JG	A165L-AG	A165L-TG
White	A16L-JW	A16L-AW	A16L-TW	A165L-JW	A165L-AW	A165L-TW
Blue	A16L-JA	A16L-AA	A16L-TA	A165L-JA	A165L-AA	A165L-TA
Black	A16L-JB	A16L-AB	A16L-TB	A165L-JB	A165L-AB	A165L-TB

Neon Lamps

Degree of protection	IP40			Oil-resistant IP65		
Color	Rectangular 	Square 	Round 	Rectangular 	Square 	Round 
Red	A16L-JRN	A16L-ARN	A16L-TRN	A165L-JRN	A165L-ARN	A165L-TRN
Green	A16L-JGN	A16L-AGN	A16L-TGN	A165L-JGN	A165L-AGN	A165L-TGN
White	A16L-JWN	A16L-AWN	A16L-TWN	A165L-JWN	A165L-AWN	A165L-TWN

Switches

Appearance	Classification				Model
	Lighted/non-lighted (common use)	Standard load/microload (common use)	SPDT	Solder terminal	A16-1
			DPDT		A16-2
			SPDT	PCB terminal	A16-1P
			DPDT		A16-2P
			DPDT	Screw-Less Clamp	A16-2S

Switches with Reduced-voltage Lighting

Appearance	Classification				Model
	100 V	Standard load/microload (common use)	SPDT	Solder terminal	A16-T1-1
			DPDT		A16-T1-2
	100 V		DPDT	Screw-less clamp	A16-T1-2S
	200 V				A16-T2-2S

Lamps

LED

Operating voltage / Light color	5 VDC	12 VDC	24 VDC
Red	A16-5DSR	A16-12DSR	A16-24DSR
Yellow	A16-5DSY	A16-12DSY	A16-24DSY
Green	A16-5DSG	A16-12DSG	A16-24DSG
White (See note.)	A16-5DSW	A16-12DSW	A16-24DSW
Blue	A16-5DA	A16-12DA	A16-24DA

Note: Use the white LED together with white or pure yellow Pushbuttons.

Incandescent Lamp

Operating voltage	5 VAC/VDC	12 VAC/VDC	24 VAC/VDC
Model	A16-5	A16-12	A16-24

Neon Lamp

Operating voltage	100 VAC	200 VAC
Red (See note.)	A16-1NRN	A16-2NRN
Green	A16-1NGN	A16-2NGN

Note: Use the red neon lamp with red or white Pushbuttons.

Cases

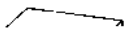
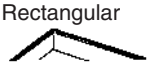
Appearance	Classification			Model
	IP40	Momentary operation	Rectangular (2-way guard)	A16-CJM
			Rectangular (3-way guard)	A16-C3JM
			Square	A16-CAM
			Round	A16-CTM
		Alternate operation	Rectangular (2-way guard)	A16-CJA
			Rectangular (3-way guard)	A16-C3JA
			Square	A16-CAA
			Round	A16-CTA
	Oil-resistant IP65	Momentary operation	Rectangular (2-way guard)	A165-CJM
			Rectangular (3-way guard)	A165-C3JM
			Square	A165-CAM
			Round	A165-CTM
		Alternate operation	Rectangular (2-way guard)	A165-CJA
			Rectangular (3-way guard)	A165-C3JA
			Square	A165-CAA
			Round	A165-CTA

Accessories (Order Separately)

Accessories

Name	Appearance	Classification	Model	Remarks
Switch Guards		For rectangular models	A16ZJ-5050	Cannot be used with the Dust Cover.
		For square and round models	A16ZA-5050	
Dust Covers		For rectangular models	A16ZJ-5060	Cannot be used with the Switch Guard.
		For square models	A16ZA-5060	
		For round models	A16ZT-5060	
Panel Plugs		For rectangular models	A16ZJ-3003	Used for covering the panel cutouts for future panel expansion.
		For square models	A16ZA-3003	
		For round models	A16ZT-3003	

Replacements

Name	Appearance	Classification			Model	Remarks
Legend Plates		Rectangular	IP40	Milky	A16ZJ-5204	A single Legend Plate (transparent) is included with a standard model. The milky Legend Plate can be used with the IP40 and oil-resistant IP65.
				Transparent	A16ZJ-5202	
			Oil-resistant IP65	Milky	A16ZJ-5204	
				Transparent	A16ZJ-5203	
		Square	IP40	Milky	A16ZA-5204	
				Transparent	A16ZA-5202	
			Oil-resistant IP65	Milky	A16ZA-5204	
				Transparent	A16ZA-5203	
		Round	IP40	Milky	A16ZT-5204	
				Transparent	A16ZT-5202	
			Oil-resistant IP65	Milky	A16ZT-5204	
				Transparent	A16ZT-5203	
Color Caps (for IP40)	Rectangular 	LED indicator/incandescent lamp/non-lighted		White	A16Z□-5001W	Insert one of the following letters into the box (□). J: Rectangular A: Square T: Round The Color Cap is usually supplied. Replace the Cap if the color is to be changed. When using an LED indicator, be sure to use a Color Cap that matches the luminescent color of the LED. The materials used for the IP40 and oil-resistant IP65 are different so be sure to use a Color Cap that matches the specifications of the Switch.
				Red	A16Z□-5001R	
				Yellow	A16Z□-5001Y	
		LED indicator		Pure yellow	A16Z□-5001PY	
				Green	A16Z□-5001GY	
		Incandescent lamp/non-lighted		Blue	A16Z□-5001A	
				Green	A16Z□-5001G	
		Non-lighted		Black	A16Z□-5011B	
Color Caps (for oil-resistant IP65)	Square 	LED indicator/incandescent lamp/non-lighted		White	A16Z□-5101W	
				Red	A16Z□-5101R	
				Yellow	A16Z□-5101Y	
	Round 	LED indicator		Pure yellow	A16Z□-5101PY	
				Green	A16Z□-5101GY	
		Incandescent lamp/non-lighted		Blue	A16Z□-5101A	
				Green	A16Z□-5101G	
		Non-lighted		Black	A16Z□-5111B	

Tools

Name	Appearance	Model	Applicable types					Remarks
			Pushbutton Switch	Knob-type Selector Switch	Key-type Selector Switch	Emergency Stop Switch	Indicator	
Extractor		A3PJ-5080	Yes	No	No	No	Yes	Convenient for extracting Pushbutton Switches
Screw Fitting		A16Z-3004	Yes	Yes	Yes	Yes	Yes	Convenient for ganged installation. Tighten to a torque of 0.39 N·m min.
Extractor		A16Z-5080	Yes	Yes	Yes	Yes	Yes	Convenient for extracting the Switch and Lamps.

Specifications

■ Approved Standards

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

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

■ Approved Standard Ratings

UL, cUL (File No. E41515)

5 A at 125 VAC, 3 A at 250 VAC (general use)
3 A at 30 VDC (resistive)

EN60947-5-1 (Low Voltage Directive)

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

■ Ratings

Contacts

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

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

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

Super-bright LED

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

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

Incandescent Lamp

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

■ Characteristics

Item		Pushbutton Switch
Allowable operating frequency	**Mechanical**	Momentary operation: 120 operations/minute max. (See note 1.) Alternate operation: 60 operations/minute max. (See note 1.)
	Electrical	20 operations/minute max. (See note 1.)
Insulation resistance		100 MΩ min. (at 500 VDC)
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between terminals of same polarity 2,000 VAC, 50/60 Hz for 1 min between terminals of different polarity and also between each terminal and ground 1,000 VAC, 50/60 Hz for 1 min between lamp terminals (See note 2.)
Vibration resistance	**Malfunction**	10 to 55 Hz, 1.5-mm double amplitude (malfunction within 1 ms)
Shock resistance	**Mechanical**	500 m/s^2
	Malfunction	150 m/s^2 max. (malfunction within 1 ms)
Durability	**Mechanical**	Momentary operation: 2,000,000 operations min. Alternate operation: 200,000 operations min. (See note 1.)
	Electrical	100,000 operations min. (See note 1.)
Ambient temperature		Operating: −10°C to 55°C (with no icing or condensation) Storage: −25°C to 65°C (with no icing or condensation)
Ambient humidity		Operating: 35% to 85%
Electric shock protection class		Class II
PTI (tracking characteristic)		175
Degree of contamination		3 (IEC947-5-1)
Weight		Approx. 10 g (in the case of a lighted DPDT switch with solder terminals)

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

Screw-Less Clamp

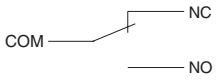
Item		Screw-Less Clamp			
Recommended wire size		0.5 mm^2 twisted wire or 0.8 mm-dia. solid wire			
Usable wires and tensile strength	Twisted wire	0.3 mm^2	0.5 mm^2	0.75 mm^2	1.25 mm^2
	Solid wire	0.5 mm dia.	0.8 mm dia.	1.0 mm dia.	---
	Tensile strength	10 N	20 N	30 N	40 N
Length of exposed wire		10 ñ1 mm			

■ Operating Characteristics

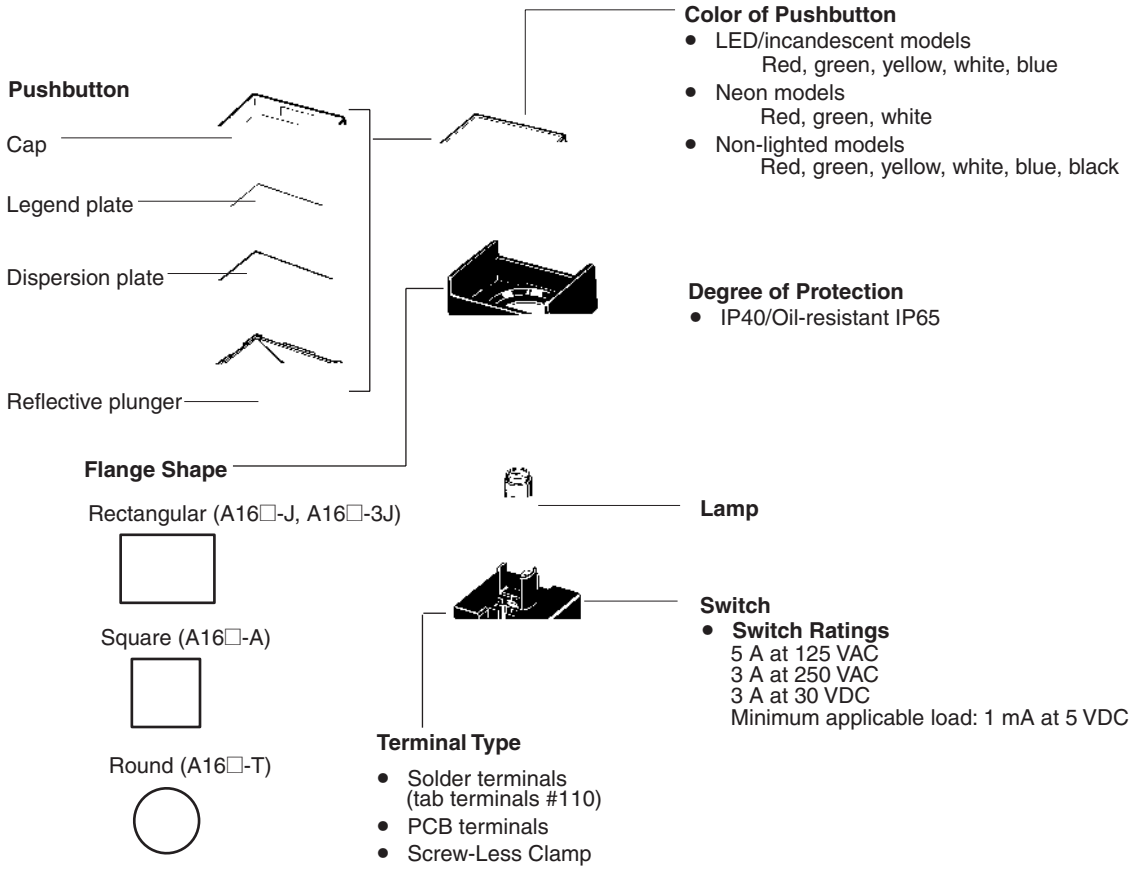
Type	Pushbutton Switch			
	IP40		Oil-resistant IP65	
Features	SPDT	DPDT	SPDT	DPDT
Operating force (OF) max.	2.45 N	4.41 N	2.94 N	4.91 N
Releasing force (RF) min.	0.29 N			
Total travel (TT)	Approx. 3 mm			
Pretravel (PT) max.	2.5 mm			
Lock stroke (LTA) min. (See note.)	0.5 mm			

Note: Lock stroke is only for alternate operation.

■ Contact Form

Name	Contact
DPDT	

Nomenclature



Dimensions

Note: All units are in millimeters unless otherwise indicated.

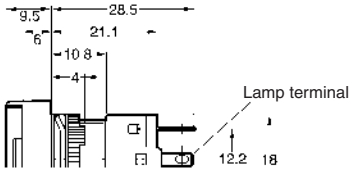
■ Lighted/Non-lighted Pushbutton Switches without Voltage Reduction Unit

The lamp terminal is also provided with non-lighted models.

Solder terminals and tab terminals (#110) can be both used with Lighted and Non-lighted Pushbutton Switches.

Rectangular
A16□-J

Solder terminals (tab terminals #110)

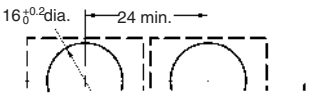


Lock ring
Mounting nut
Lamp terminals

Packing (t0.5)
(for oil-resistant IP65 only)

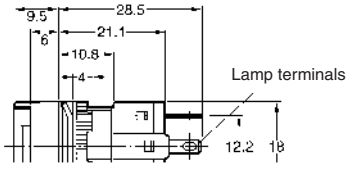
Panel Cutouts

See page L-29 for panel cutouts



Square
A16□-A

Solder terminals (tab terminals #110)

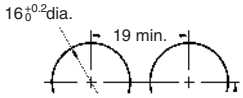


Lock ring
Mounting nut
Lamp terminals

Packing (t0.5)
(for oil-resistant IP65 only)

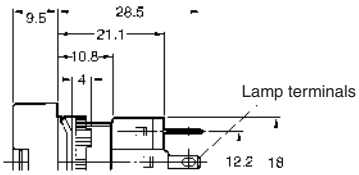
Panel Cutouts

See page L-29 for panel cutouts



Rectangular
A16□-3J

Solder terminals (tab terminals #110)

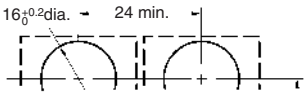


Lock ring
Mounting nut
Lamp terminals

Packing (t0.5)
(for oil-resistant IP65 only)

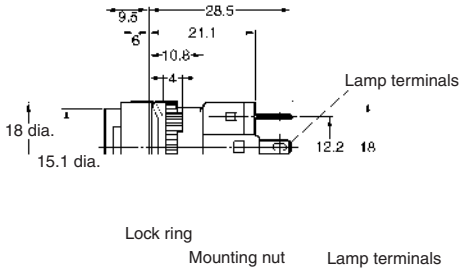
Panel Cutouts

See page L-29 for panel cutouts



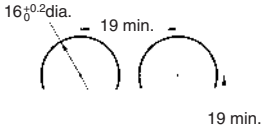
Round
A16□-T

Solder terminals (tab terminals #110)



Panel Cutouts

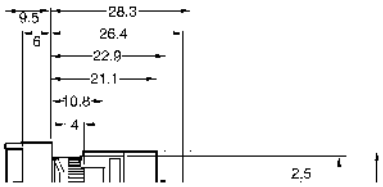
See page L-29 for panel cutouts



The following diagrams show the rectangular model as a representative example.

Rectangular
A16□-J

PCB terminals

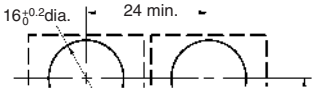


Lock ring
Mounting nut

Packing (t0.5)
(for oil-resistant IP65 only)

Panel Cutouts

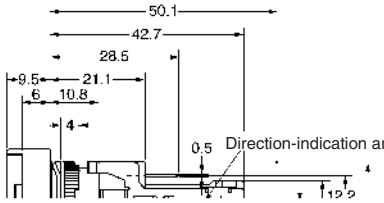
See page L-29 for panel cutouts



24 min.

Rectangular
A16□-T1, T2

Voltage-reduction lighting,
solder terminals
(tab terminals #110)



Pushbutton

Case

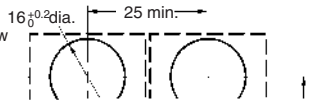
Marking face

Packing (t0.5)
(for oil-resistant IP65 only)

Lock ring
Mounting ring
Switch

Panel Cutouts

See page L-29 for panel cutouts

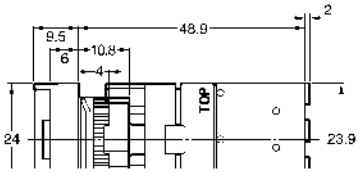


23 min.
(Dimension A)

Recommended panel thickness: 0.5 to 3.2 mm

Rectangular
A16□-2S

Screw-Less Clamp



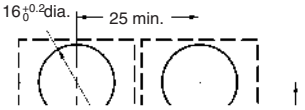
Switch dismounting lever

Lock ring
Mounting ring

Packing (t0.5)
(for oil-resistant IP65 only)

Panel Cutouts

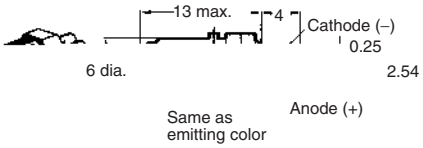
See page L-29 for panel cutouts



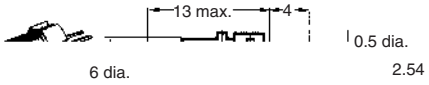
33 min.

■ Lamps

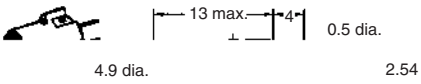
LED
A16-5DS□/-12DS□/-24DS□



Incandescent Lamp
A16-5/-12/-24

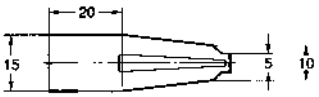


Neon Lamp
A16-1N/-2N

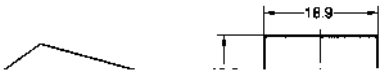


■ Accessories, Tools, and Components

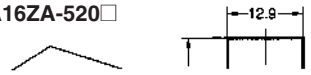
Extractor
A3PJ-5080



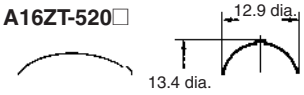
Legend Plates
A16ZJ-520□



A16ZA-520□



A16ZT-520□

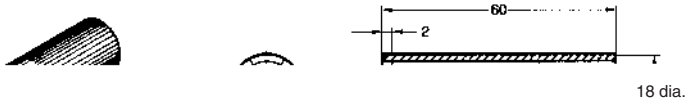


Note: 1. The panel is 0.6 mm thick.
2. The panel is made of the materials listed in the following table.

Color	Degree of protection	Materials
Milky	IP40	Polyacrylate resin
	IP65	
Transparent	IP40	Polycarbonate resin
	IP65	Polyacrylate resin

Note: The standard model is transparent.

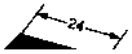
Screw Fitting
A16Z-3004



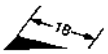
Panel Plugs (Black Resin)

Select the Plug that fits the panel design and mount from the front of the Panel. Panel cutouts are the same as those for Switches.

Rectangular
A16ZJ-3003

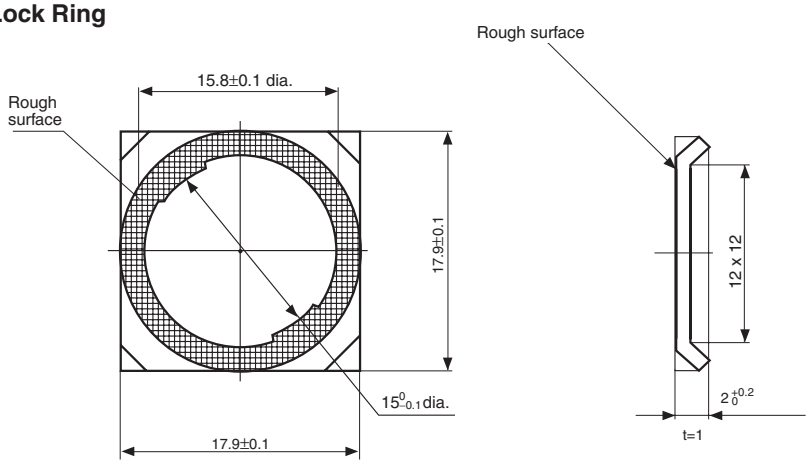


Square
A16ZA-3003

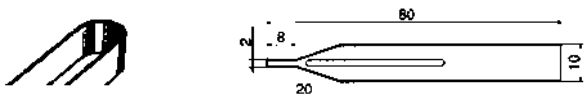


Round
A16ZT-3003

Lock Ring



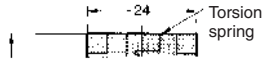
Extractor
A16Z-5080

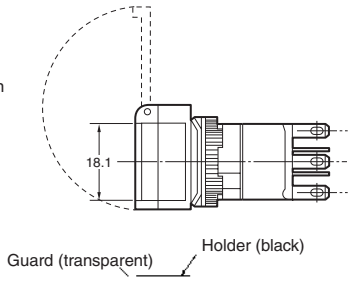


■ Dimensions with Accessories

Switch Guards

Rectangular
A16ZJ-5050

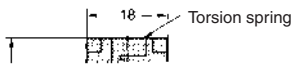


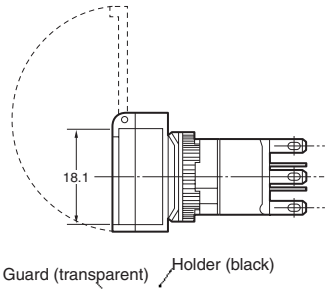


Panel Cutouts (Top View)

Note: The above illustration shows the case where 4.5 mm is provided for the distance "x." If no clearance is required for the "x" section, the vertical mounting dimension can be as small as 24 mm. Set this distance according to operating conditions.

Square
A16ZA-5050



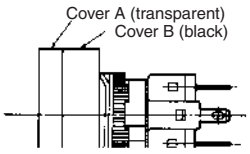


Panel Cutouts (Top View)

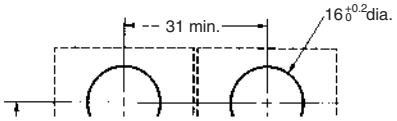
Note: The above illustration shows the case where 4.5 mm is provided for the distance "x." If no clearance is required for the "x" section, the vertical mounting dimension can be as small as 24 mm.Set this distance according to operating conditions.For models with PCB terminals, the horizontal mounting dimension is 24 mm min.

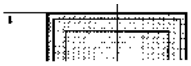
Dust Covers

Rectangular
A16ZJ-5060



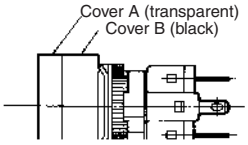
Panel Cutouts



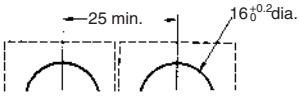


25 min.

Square
A16ZA-5060

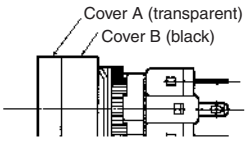


Panel Cutouts

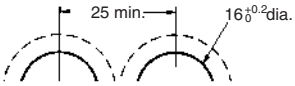


25 min.

Round
A16ZT-5050



Panel Cutouts



24 dia.

25 min.

■ Terminal Arrangement

Models without Reduced-voltage Lighting

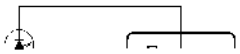
Non-lighted Pushbutton Switches are also provided with lamp terminals.

Solder Terminals

Lighted SPDT Switches

Dimensions of Terminal Holes

Terminal Arrangement (Bottom View)

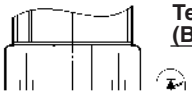


Lamp terminal

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

Lighted DPDT Switches

Dimensions of Terminal Holes



Terminal Arrangement (Bottom View)

Lamp terminal

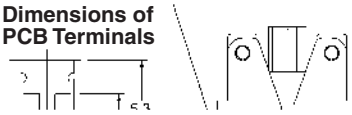
Note: The L+ is not shown on the Switch.

PCB Terminals

Lighted SPDT Switches

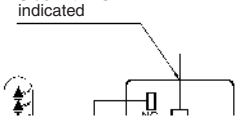
Dimensions of PCB Terminals

Model, rating, and lot number indication



Terminal Arrangement (Bottom View)

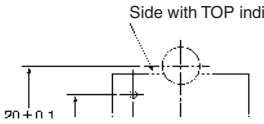
Side with TOP indicated



Lamp terminal (t=0.5)

PCB Cutouts (Bottom View)

Side with TOP indicated

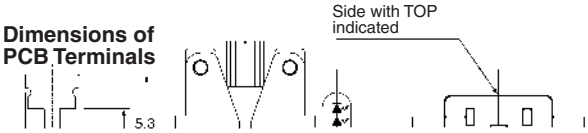


Five, 1 dia.

Two, 5 dia.

Lighted DPDT Switches

Dimensions of PCB Terminals



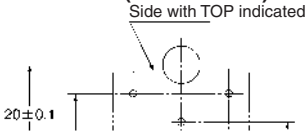
Terminal Arrangement (Bottom View)

Side with TOP indicated

Lamp terminal (t=0.5)

PCB Cutouts (Bottom View)

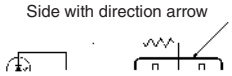
Side with TOP indicated



Eight, 1 dia.

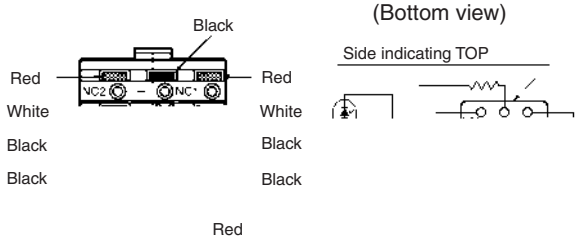
Two, 5 dia.

Voltage Reduction Units

DPDT lighted models
(Bottom view) Side with direction arrow 

- The voltage-reduction circuit is built in.

Screw-Less Clamps

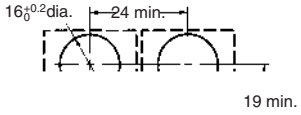
DPDT lighted models


- Voltage-reduction lighting models with Screw-Less Clamps (A16L-□T1-2S, A16L-□T2-2S) incorporate voltage-reduction circuits.

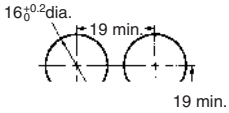
■ Panel Cutouts

Solder Terminals

Rectangular A16□-J/M16□-□J
(Top View)



Square A16□-A/M16□-A
Round A16□-T/M16□-T
(Top View)

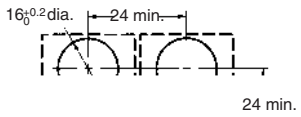


Note: 1. Make sure the thickness of the mounting panel is between 0.5 and 3.2 mm. If, however, a Switch Guard or Dust Cover is used, the thickness of the mounting panel must be between 0.5 and 2 mm.

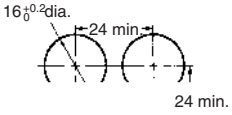
2. If the panel is to be finished with coating, etc., make sure that the panel meets the specified dimensions after coating.

PCB Terminals

Rectangular A16□-J/M16□-J
(Top View)



Square A16□-A/M16□-A, A165□-BA, M165-BA
Round A16□-T/M16□-T
(Top View)



Note: 1. Ensure that the variation in the distance between the centers of neighboring mounting holes is less than ±0.1 mm.

2. Make sure the thickness of the mounting panel is between 0.5 and 3.2 mm. If, however, a Switch Guard or Dust Cover is used, the thickness of the mounting panel must be between 0.5 and 2 mm.

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

Installation

■ Panel Mounting

After mounting the Pushbutton Unit (i.e., the Pushbutton and the Case) to the panel, snap in the Switch Unit (i.e., the Switch and the Lamp) from the back of the panel.

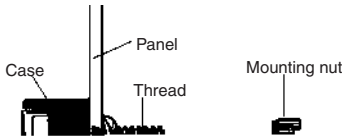
Mounting to the Panel

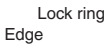
Insert the Pushbutton Unit into the front of the panel, and fix the lock ring and mounting nut from the terminal side.

Make sure that the lock ring is aligned with the thread of the Case and the edge of the lock ring is touching the panel.

Tighten the mounting nuts to a torque of 0.29 to 0.49 N·m.

The maximum tightening torque is 0.49 N·m.

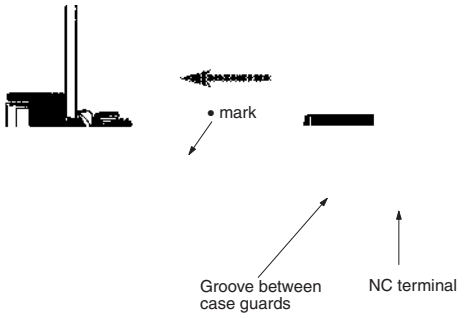




Mounting the Switch Unit

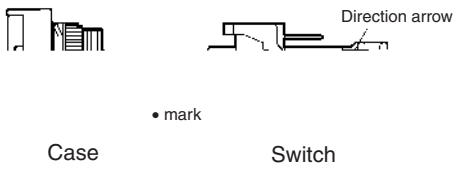
Snap on the Switch Unit to the Pushbutton Unit.

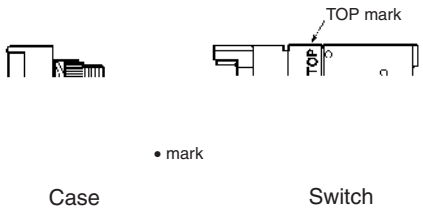
Make sure that the Switch Unit has the correct orientation when snapping it onto the Case. Align the • mark on the Case with the groove between the case guards on the NC terminal side of the Switch Unit in the way shown below, and push the Switch Unit into the Case until it clicks into place. Confirm that the Switch Unit is securely in place before using.



Mounting the Switch Unit for Voltage Reduction Types

1. The mounting panel thickness must be 0.5 to 3.2 mm.
2. The mounting ring must be tightened to a torque 0.29 to 0.49 N·m.
3. The mounting hole must be cut out in the way described previously. The dimension A is the length required for removing the Switch when it is in the mounted state. If Switches are mounted side-by-side separated by less than the specified distance, it may not be possible to remove the Switch.
4. Be sure to mount the Case to the Switch with the correct orientation. Mount with the • mark on the Case facing in the same direction as the side of the Switch with the direction arrow or the word TOP.

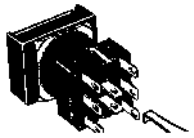




Removing the Switch Unit

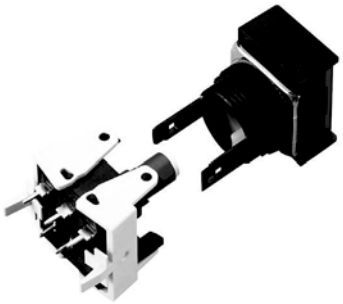
Grip the part between the Switch holder of the Case and the Switch Unit using the A16Z-5080 Extractor, and pull to remove the Switch Unit.

• 16-mm Models



A16Z-5080 Extractor

• A16-P Models (with PCB Terminals)



The Switch Unit can be mounted or dismounted by simply opening or closing the lever.

■ Mounting and Replacing the Pushbutton

Removing and Mounting the Pushbutton

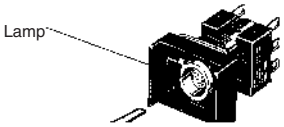
1. Remove the Pushbutton as shown in the following diagram. If the Pushbutton cannot be removed by hand, use the A3PJ-5080 Extractor.

Pushbutton

2. To attach the Pushbutton, push until it clicks into place.

Removing the Lamp

Removing from the Pushbutton End



Grip the Lamp with the A16Z-5080 Extractor and pull to remove.

Removing from the Switch End

The Lamp can be removed by hand once the Switch is removed using the A16Z-5080 Extractor.

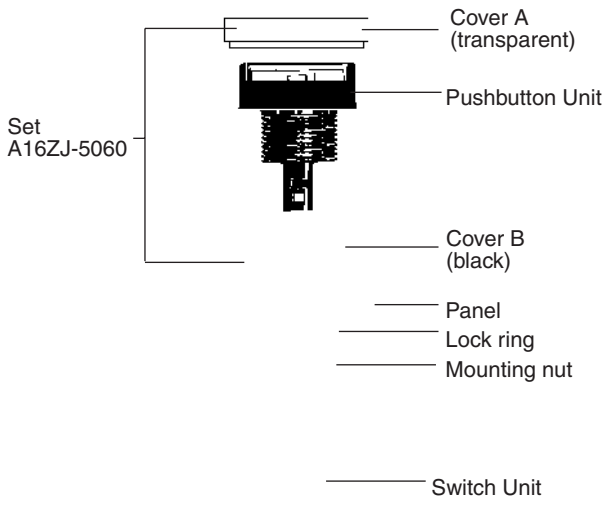
Installing the Lamp

When mounting the Lamp, make sure it is facing the direction shown in the following diagram. Insert the Lamp while matching the protruding part of the Lamp and the small guides on the outer surface of the Case.

Protruding part

The Lamp can be mounted from the Pushbutton end by using the A16Z-5080 Extractor. The lamp can be mounted by following the opposite procedure for removing the Lamp.

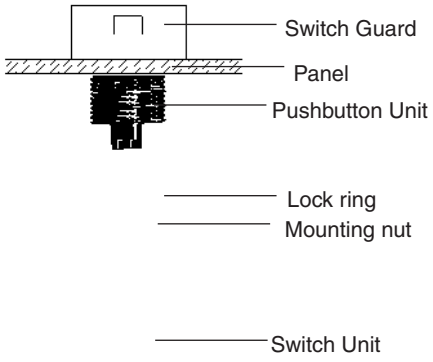
■ Mounting the A16Z Dust Cover



1. Separate the Dust Cover into 2 parts: cover A and cover B.
2. Insert the Case into cover B.
3. Mount these parts together onto the panel.
4. From the back of the panel, mount the lock ring and secure with the mounting nut.
5. Insert cover A into cover B. Ensure that the entire perimeter of cover A is securely attached to cover B by pressing in different directions.
6. Mount the Switch Unit to the Case.

Note: Recommended panel thickness: 0.5 to 2 mm.

■ Mounting the A16Z Switch Guard



1. Insert the Case into the Switch Guard.
2. Mount these parts together onto the panel.

Precautions

Refer to the *Technical Information for Pushbutton Switches* (Cat. No. A143).

⚠ 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 operating part 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.

■ Correct Use

Mounting

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

Do not tighten the mounting nut more than necessary using tools such as pointed-nose pliers. Doing so will damage the mounting nut. The tightening torque is 0.29 to 0.49 N·m.

Wiring

Solder Terminal

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

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

1. Hand soldering: 30 W, within 5 s

2. Dip soldering: 240 °C, within 3 s

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

Use non-corrosive resin fluid as the flux.

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

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

Screw-Less Clamps

Mounting Procedure

1. Strip a length of 10 mm off the end of the wire (allowable range: 10±1 mm).
2. Bunch wire strands together and straighten them.
3. Insert the wire into the insertion hole while pressing the release button at the side of the hole. (Using a precision screwdriver is recommended.)
4. Let go of the release button to lock the wire into place.
5. After locking, pull on the wire gently to confirm that it is securely locked.

Removing Procedure

Remove wires by pulling them while pressing the release button.

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

Operating Environment

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

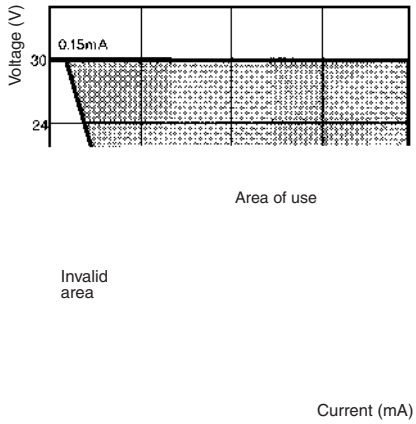
Using the Microload

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

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

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

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



LED

The LED current-limiting resistor is built-in, so internal resistance is not required.

Rated voltage	Internal limiting resistor
5 VDC	33 Ω (82 Ω)
12 VDC	270 Ω (470 Ω)
24 VDC	1600 Ω (2400 Ω)

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

Others

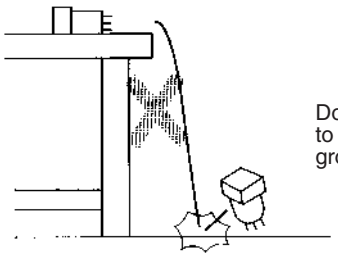
The oil-resistant IP65 uses NBR rubber and is resistant to general cutting oil and cooling oil. Some particular oils cannot be used with the oil-resistant IP65, however, so contact your OMRON representative for details.

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

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

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

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



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

Do not place or drop heavy objects on the Switch.

Do not operate the Switch with hard or sharp objects.

Hammer Screwdriver

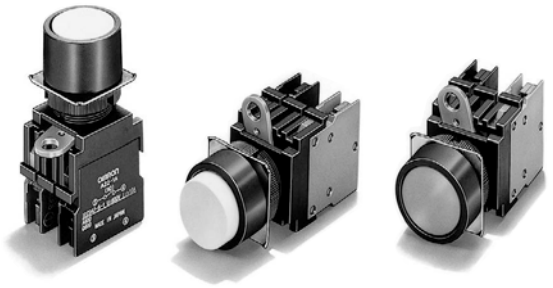
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. A124-E2-02

Pushbutton Switch
A22

Install in 22-dia. or 25-dia. Panel Cutout

- Easy mounting and removal of 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.
- Wide range of shapes and colors.
- IP65 oil resistance (non-lighted models)
  IP65 (lighted models)
- EN60947-5-1
- UL and cUL approved (File No. E41515)



Model Number Structure

■ Model Number Legend

Completely Assembled

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

A22□-□□-□-□□
(1 2 3 4 5 6)

1 Lighted/Non-lighted

Code	Description
None	Non-lighted
L	Lighted

2 Flange Shape

Code	Description
Non-lighted	
F	Round/Flat
T	Round/Projection
G	Round/Full-guard
H	Round/Half-guard
C	Square/Projection
D	Square/Full-guard
S	Round/Mushroom (30-dia. head)
M	Round/Mushroom (40-dia. head)
Lighted	
T	Round/Projection
G	Round/Full-guard
H	Round/Half-guard
C	Square/Projection
D	Square/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

Code	Operating Voltage	
Without Voltage Reduction Unit		
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
H1		100 VAC/VDC
With Voltage Reduction Unit		
T1	LED	110 VAC (See note 1)
T2		220 VAC (See note 2)

5 Contacts

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

Note: Refer to page L-50 for contact ratings

6 Switch Action

Code	Description
M	Momentary
A	Alternate

Note: 1. Operational voltage: 95 to 115 VAC
2. Operational voltage: 190 to 230 VAC
3. The LED lamp (24 VAC/VDC) can be lit by directly applying 110 VAC/VDC (220 VAC/VDC) to the lamp terminal.
4. LED incorporates the 24-VAC/VDC type to the Voltage Reduction Unit models.

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.

1. Pushbutton

A22□-□□ (1 2 3)

1 Lighted/Non-lighted

Code	Description
None	Non-lighted
L	Lighted

2 Flange Shape

Code	Description
Non-lighted	
F	Round/Flat
T	Round/Projection
G	Round/Full-guard
H	Round/Half-guard
C	Square/Projection
D	Square/Full-guard
S	Round/Mushroom (30-dia. head)
M	Round/Mushroom (40-dia. head)
Lighted	
T	Round/Projection
G	Round/Full-guard
H	Round/Half-guard
C	Square/Projection
D	Square/Full-guard

3 Illumination Color

Code	Description
R	Red
G	Green
Y	Yellow
W	White
A	Blue
B	Black (for non-lighted type only)

2. Lamp

A22-□□ (1 2)

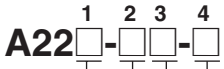
1 Operating Voltage (Rated Voltage)

Code	Description
Incandescent lamp	
5	5 VAC (6 VAC)
12	12 VAC (14 VAC)
24	24 VAC (28 VAC)
H1	100 VAC (130 VAC)
LED lamp	
6D	6 VDC (6 VDC)
6A	6 VAC (6 VAC)
12A	12 VAC/VDC (12 VAC/VDC)
24A	24 VAC/VDC (24 VAC/VDC)

2 Illumination Color

Code	Description
None	Incandescent lamp
R	Red
G	Green
Y	Yellow
A	Blue

3. Switch (Standard Load)



1 Lighted/Non-lighted

Code	Description
None	Non-lighted
L	Lighted

2 Contacts

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

3 Switch Action

Code	Description
M	Momentary
A	Alternate

4 Voltage Reduction Unit (Lighted Type Only)

Code	Description
None	Without Voltage Reduction Unit
T1	110 VAC (See note 1)
T2	220 VAC (See note 2)

Note: 1. Operational voltage: 95 to 115 VAC
2. Operational voltage: 190 to 230 VAC

Ordering Information

■ List of Models

Ordering as a Set

Non-lighted (Round Type)

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

Non-lighted (Square Type)

Appearance	Output	Momentary operation (self-reset)	Alternate operation (self-holding)	Illumination color
Square/Projection type  A22-C	SPST-NO	A22-C□-10M	A22-C□-10A	Insert one of the following letters into the box □. 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	
	DPST-NO	A22-C□-20M	A22-C□-20A	
	DPST-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	
	DPST-NO	A22-D□-20M	A22-D□-20A	
	DPST-NC	A22-D□-02M	A22-D□-02A	

Lighted (Round Type)

Appearance	Output	Lighting	Operating voltage	Momentary operation (self-resetting)	Alternate operation (self-holding)	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	Insert one of the following letters into the box □. 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	
	DPST-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	
	DPST-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	

Appearance	Output	Lighting	Operating voltage	Momentary operation (self-resetting)	Alternate operation (self-holding)	Illumination color
Round/Projection type LED voltage-reduction lighting (with Voltage Reduction Unit)  A22L-T	SPST-NO	LED	110 VAC	A22L-T□-T1-10M	A22L-T□-T1-10A	Insert one of the following letters into the box □. R (red) Y (yellow) G (green) W (white) A (blue)
			220 VAC	A22L-T□-T2-10M	A22L-T□-T2-10A	
	SPST-NC		110 VAC	A22L-T□-T1-01M	A22L-T□-T1-01A	
			220 VAC	A22L-T□-T2-01M	A22L-T□-T2-01A	
	SPST-NO + SPST-NC		110 VAC	A22L-T□-T1-11M	A22L-T□-T1-11A	
			220 VAC	A22L-T□-T2-11M	A22L-T□-T2-11A	
	DPST-NO		110 VAC	A22L-T□-T1-20M	A22L-T□-T1-20A	
			220 VAC	A22L-T□-T2-20M	A22L-T□-T2-20A	
	DPST-NC		110 VAC	A22L-T□-T1-02M	A22L-T□-T1-02A	
			220 VAC	A22L-T□-T2-02M	A22L-T□-T2-02A	
Round/Half-guard type LED lighting (without Voltage Reduction Unit)  A22L-H	SPST-NO		6 VDC	A22L-H□-6D-10M	A22L-H□-6D-10A	
			6 VAC	A22L-H□-6A-10M	A22L-H□-6A-10A	
			12 VAC/VDC	A22L-H□-12A-10M	A22L-H□-12A-10A	
			24 VAC/VDC	A22L-H□-24A-10M	A22L-H□-24A-10A	
	SPST-NC		6 VDC	A22L-H□-6D-01M	A22L-H□-6D-01A	
			6 VAC	A22L-H□-6A-01M	A22L-H□-6A-01A	
			12 VAC/VDC	A22L-H□-12A-01M	A22L-H□-12A-01A	
			24 VAC/VDC	A22L-H□-24A-01M	A22L-H□-24A-01A	
	SPST-NO + SPST-NC		6 VDC	A22L-H□-6D-11M	A22L-H□-6D-11A	
			6 VAC	A22L-H□-6A-11M	A22L-H□-6A-11A	
			12 VAC/VDC	A22L-H□-12A-11M	A22L-H□-12A-11A	
			24 VAC/VDC	A22L-H□-24A-11M	A22L-H□-24A-11A	
	DPST-NO		6 VDC	A22L-H□-6D-20M	A22L-H□-6D-20A	
			6 VAC	A22L-H□-6A-20M	A22L-H□-6A-20A	
			12 VAC/VDC	A22L-H□-12A-20M	A22L-H□-12A-20A	
			24 VAC/VDC	A22L-H□-24A-20M	A22L-H□-24A-20A	
	DPST-NC		6 VDC	A22L-H□-6D-02M	A22L-H□-6D-02A	
			6 VAC	A22L-H□-6A-02M	A22L-H□-6A-02A	
			12 VAC/VDC	A22L-H□-12A-02M	A22L-H□-12A-02A	
			24 VAC/VDC	A22L-H□-24A-02M	A22L-H□-24A-02A	

Appearance	Output	Lighting	Operating voltage	Momentary operation (self-resetting)	Alternate operation (self-holding)	Illumination color
Round/Half-guard type LED voltage-reduction lighting (with Voltage Reduction Unit)  A22L-H	SPST-NO	LED	110 VAC	A22L-H□-T1-10M	A22L-H□-T1-10A	Insert one of the following letters into the box □. R (red) Y (yellow) G (green) W (white) A (blue)
			220 VAC	A22L-H□-T2-10M	A22L-H□-T2-10A	
	SPST-NC		110 VAC	A22L-H□-T1-01M	A22L-H□-T1-01A	
			220 VAC	A22L-H□-T2-01M	A22L-H□-T2-01A	
	SPST-NO + SPST-NC		110 VAC	A22L-H□-T1-11M	A22L-H□-T1-11A	
			220 VAC	A22L-H□-T2-11M	A22L-H□-T2-11A	
	DPST-NO		110 VAC	A22L-H□-T1-20M	A22L-H□-T1-20A	
			220 VAC	A22L-H□-T2-20M	A22L-H□-T2-20A	
	DPST-NC		110 VAC	A22L-H□-T1-02M	A22L-H□-T1-02A	
			220 VAC	A22L-H□-T2-02M	A22L-H□-T2-02A	
Round/Full-guard type LED lighting (without Voltage Reduction Unit)  A22L-G	SPST-NO		6 VDC	A22L-G□-6D-10M	A22L-G□-6D-10A	
			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	
	DPST-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	
	DPST-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		110 VAC	A22L-G□-T1-10M	A22L-G□-T1-10A	
			220 VAC	A22L-G□-T2-10M	A22L-G□-T2-10A	
	SPST-NC		110 VAC	A22L-G□-T1-01M	A22L-G□-T1-01A	
			220 VAC	A22L-G□-T2-01M	A22L-G□-T2-01A	
	SPST-NO + SPST-NC		110 VAC	A22L-G□-T1-11M	A22L-G□-T1-11A	
			220 VAC	A22L-G□-T2-11M	A22L-G□-T2-11A	
	DPST-NO		110 VAC	A22L-G□-T1-20M	A22L-G□-T1-20A	
			220 VAC	A22L-G□-T2-20M	A22L-G□-T2-20A	
	DPST-NC		110 VAC	A22L-G□-T1-02M	A22L-G□-T1-02A	
			220 VAC	A22L-G□-T2-02M	A22L-G□-T2-02A	

Lighted (Square Type)

Appearance	Output	Lighting	Operating voltage	Momentary operation (self-resetting)	Alternate operation (self-holding)	Illumination color
Square/Projection type LED lighting (without Voltage Reduction Unit)  A22L-C	SPST-NO	LED	6 VDC	A22L-C□-6D-10M	A22L-C□-6D-10A	Insert one of the following letters into the box □. R (red) Y (yellow) G (green) W (white) A (blue)
			6 VAC	A22L-C□-6A-10M	A22L-C□-6A-10A	
			12 VAC/VDC	A22L-C□-12A-10M	A22L-C□-12A-10A	
			24 VAC/VDC	A22L-C□-24A-10M	A22L-C□-24A-10A	
	SPST-NC		6 VDC	A22L-C□-6D-01M	A22L-C□-6D-01A	
			6 VAC	A22L-C□-6A-01M	A22L-C□-6A-01A	
			12 VAC/VDC	A22L-C□-12A-01M	A22L-C□-12A-01A	
			24 VAC/VDC	A22L-C□-24A-01M	A22L-C□-24A-01A	
	SPST-NO + SPST-NC		6 VDC	A22L-C□-6D-11M	A22L-C□-6D-11A	
			6 VAC	A22L-C□-6A-11M	A22L-C□-6A-11A	
			12 VAC/VDC	A22L-C□-12A-11M	A22L-C□-12A-11A	
			24 VAC/VDC	A22L-C□-24A-11M	A22L-C□-24A-11A	
	DPST-NO		6 VDC	A22L-C□-6D-20M	A22L-C□-6D-20A	
			6 VAC	A22L-C□-6A-20M	A22L-C□-6A-20A	
			12 VAC/VDC	A22L-C□-12A-20M	A22L-C□-12A-20A	
			24 VAC/VDC	A22L-C□-24A-20M	A22L-C□-24A-20A	
	DPST-NC		6 VDC	A22L-C□-6D-02M	A22L-C□-6D-02A	
			6 VAC	A22L-C□-6A-02M	A22L-C□-6A-02A	
			12 VAC/VDC	A22L-C□-12A-02M	A22L-C□-12A-02A	
			24 VAC/VDC	A22L-C□-24A-02M	A22L-C□-24A-02A	
Square/Projection type LED voltage-reduction lighting (with Voltage Reduction Unit)  A22L-C	SPST-NO		110 VAC	A22L-C□-T1-10M	A22L-C□-T1-10A	
			220 VAC	A22L-C□-T2-10M	A22L-C□-T2-10A	
	SPST-NC		110 VAC	A22L-C□-T1-01M	A22L-C□-T1-01A	
			220 VAC	A22L-C□-T2-01M	A22L-C□-T2-01A	
	SPST-NO + SPST-NC		110 VAC	A22L-C□-T1-11M	A22L-C□-T1-11A	
			220 VAC	A22L-C□-T2-11M	A22L-C□-T2-11A	
	DPST-NO		110 VAC	A22L-C□-T1-20M	A22L-C□-T1-20A	
			220 VAC	A22L-C□-T2-20M	A22L-C□-T2-20A	
	DPST-NC		110 VAC	A22L-C□-T1-02M	A22L-C□-T1-02A	
			220 VAC	A22L-C□-T2-02M	A22L-C□-T2-02A	

Appearance	Output	Lighting	Operating voltage	Momentary operation (self-resetting)	Alternate operation (self-holding)	Illumination color
Square/Full-guard type LED lighting (without Voltage Reduction Unit)  A22L-D	SPST-NO	LED	6 VDC	A22L-D□-6D-10M	A22L-D□-6D-10A	Insert one of the following letters into the box □. R (red) Y (yellow) G (green) W (white) A (blue)
			6 VAC	A22L-D□-6A-10M	A22L-D□-6A-10A	
			12 VAC/VDC	A22L-D□-12A-10M	A22L-D□-12A-10A	
			24 VAC/VDC	A22L-D□-24A-10M	A22L-D□-24A-10A	
	SPST-NC		6 VDC	A22L-D□-6D-01M	A22L-D□-6D-01A	
			6 VAC	A22L-D□-6A-01M	A22L-D□-6A-01A	
			12 VAC/VDC	A22L-D□-12A-01M	A22L-D□-12A-01A	
			24 VAC/VDC	A22L-D□-24A-01M	A22L-D□-24A-01A	
	SPST-NO + SPST-NC		6 VDC	A22L-D□-6D-11M	A22L-D□-6D-11A	
			6 VAC	A22L-D□-6A-11M	A22L-D□-6A-11A	
			12 VAC/VDC	A22L-D□-12A-11M	A22L-D□-12A-11A	
			24 VAC/VDC	A22L-D□-24A-11M	A22L-D□-24A-11A	
	DPST-NO		6 VDC	A22L-D□-6D-20M	A22L-D□-6D-20A	
			6 VAC	A22L-D□-6A-20M	A22L-D□-6A-20A	
			12 VAC/VDC	A22L-D□-12A-20M	A22L-D□-12A-20A	
			24 VAC/VDC	A22L-D□-24A-20M	A22L-D□-24A-20A	
	DPST-NC		6 VDC	A22L-D□-6D-02M	A22L-D□-6D-02A	
			6 VAC	A22L-D□-6A-02M	A22L-D□-6A-02A	
			12 VAC/VDC	A22L-D□-12A-02M	A22L-D□-12A-02A	
			24 VAC/VDC	A22L-D□-24A-02M	A22L-D□-24A-02A	
Square/Full-guard type LED voltage-reduction lighting (with Voltage Reduction Unit)  A22L-D	SPST-NO		110 VAC	A22L-D□-T1-10M	A22L-D□-T1-10A	
			220 VAC	A22L-D□-T2-10M	A22L-D□-T2-10A	
	SPST-NC		110 VAC	A22L-D□-T1-01M	A22L-D□-T1-01A	
			220 VAC	A22L-D□-T2-01M	A22L-D□-T2-01A	
	SPST-NO + SPST-NC		110 VAC	A22L-D□-T1-11M	A22L-D□-T1-11A	
			220 VAC	A22L-D□-T2-11M	A22L-D□-T2-11A	
	DPST-NO		110 VAC	A22L-D□-T1-20M	A22L-D□-T1-20A	
			220 VAC	A22L-D□-T2-20M	A22L-D□-T2-20A	
	DPST-NC		110 VAC	A22L-D□-T1-02M	A22L-D□-T1-02A	
			220 VAC	A22L-D□-T2-02M	A22L-D□-T2-02A	

Ordering Individually

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)

Pushbutton

Non-lighted

Color	IP65 oil-resistant models			
	Flat type 	Projection type 	Full-guard type 	Half-guard type 
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

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

Lighted

Color	IP65		
	Projection type 	Full-guard type 	Half-guard type 
Red	A22L-TR	A22L-GR	A22L-HR
Green	A22L-TG	A22L-GG	A22L-HG
Yellow	A22L-TY	A22L-GY	A22L-HY
White	A22L-TW	A22L-GW	A22L-HW
Blue	A22L-TA	A22L-GA	A22L-HA

Note: Common to incandescent lamps and LED lamps.

Color	IP65	
	Square/Projection 	Square/Full-guard type 
Red	A22L-CR	A22L-DR
Green	A22L-CG	A22L-DG
Yellow	A22L-CY	A22L-DY
White	A22L-CW	A22L-DW
Blue	A22L-CA	A22L-DA

Lamp

LED Lamp

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

Note: 1. For voltage-reduction lighting, use the A22-24A□.

2. Used when the Pushbutton color is yellow or white.

Incandescent Lamp

Operating voltage	5 VAC/VDC	12 VAC/VDC	24 VAC/VDC	100 VAC/VDC
	A22-5	A22-12	A22-24	A22-H1

Switch (Standard Load)

Non-lighted

Switch operation 	Contacts	Model
Momentary	SPST-NO	A22-10M
	SPST-NC	A22-01M
	SPST-NO + SPST-NC	A22-11M
	DPST-NO	A22-20M
	DPST-NC	A22-02M
Alternate	SPST-NO	A22-10A
	SPST-NC	A22-01A
	SPST-NO + SPST-NC	A22-11A
	DPST-NO	A22-20A
	DPST-NC	A22-02A

Lighted

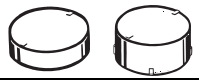
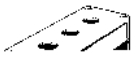
Switch operation	Contacts	Voltage reduction circuits		
		Without Voltage Reduction Unit 	With Voltage Reduction Unit	
			110 VAC 	220 VAC 
Momentary	SPST-NO	A22L-10M	A22L-10M-T1	A22L-10M-T2
	SPST-NC	A22L-01M	A22L-01M-T1	A22L-01M-T2
	SPST-NO + SPST-NC	A22L-11M	A22L-11M-T1	A22L-11M-T2
	DPST-NO	A22L-20M	A22L-20M-T1	A22L-20M-T2
	DPST-NC	A22L-02M	A22L-02M-T1	A22L-02M-T2
Alternate	SPST-NO	A22L-10A	A22L-10A-T1	A22L-10A-T2
	SPST-NC	A22L-01A	A22L-01A-T1	A22L-01A-T2
	SPST-NO + SPST-NC	A22L-11A	A22L-11A-T1	A22L-11A-T2
	DPST-NO	A22L-20A	A22L-20A-T1	A22L-20A-T2
	DPST-NC	A22L-02A	A22L-02A-T1	A22L-02A-T2

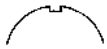
Note: 1. The above diagrams show the DPST-NO contact models as representative examples.
2. For voltage-reduction lighting, use the A22-24A□.

■ Accessories (Order Separately)

Common to A22, A22S/W, A22K, M22, and A22E

Item		Appearance	Classification		Model	Remarks
Switch Blocks			SPST-NO	Standard load	A22-10	Provided as standard. Order Switch Blocks only when adding or replacing them.
				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	
Lamp Sockets			Direct lighting		A22-TN	Used when changing the lighting method. (LED only)
			Voltage-reduction lighting	110 VAC	A22-T1	
				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	
				Red	A22Z-3332	
				Black	A22Z-3333	
			Without Snap-in Legend Plate		A22Z-3330	
Lock Ring			Round		A22Z-3360	The body is equipped with a Lock Ring. 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
			For full-guard models		A22Z-3582	

Item		Appearance	Classification		Model	Remarks
Sealing Caps			For flat models		A22Z-3600F	Used to prevent dust or water from entering the Operation Unit (Push button, etc.). Color: opaque Material: silicon
			For projection models		A22Z-3600T	
			For full-guard models		A22Z-3600G	
Caps	A22	For A22 For M22 	For projection, full-guard, or half-guard models		A22Z-3490	Material: polycarbonate resin
	M22		For round models		A22Z-3495	
Color Caps			Red		A22Z-30TR	Used for changing the Pushbutton color of the (round) Pushbutton Switches.
			Green		A22Z-30TG	
			Yellow		A22Z-30TY	
			White		A22Z-30TW	
			Blue		A22Z-30TA	
Three-throw Spacer					A22Z-3003	Used when mounting three Non-lighted Switches. (See page L-65.)
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. 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 page L-63.)
				9 to 11 dia.	A22Z-3500-2	
25-dia. Ring			---		A22Z-R25	Use when mounting to a panel with a 25-dia. hole. For details, refer to page L-54. Since this is not attached to the main body, order separately.
30-dia. Metal Flange			Flat, projecting		A22Z-F30	Use instead of the standard flange when mounting into a panel with a 30-dia. hole. For details of mounting hole dimensions, refer to the corresponding section for the A30.
			Full guard		A22Z-G30	
30-dia. Resin Attachment			Round		A22Z-A30	Use when mounting to a panel with a 30-dia. hole. For details, refer to page L-56.
Lock Plate			---		A22Z-3380	Use to fix the lever on the Switch.
Simple Protective Cover			---		A11Z-3700	Prevents foreign matter entering into the Switch from the back of the panel.

Item		Appearance	Classification		Model	Remarks
Snap-in Legend Plates	Standard size		Without text	Black	A22Z-3443B	Attached to the Standard-size Legend Plate Frame. Material: Acrylic (See page L-56.)
				Red	A22Z-3443R	
				White	A22Z-3443W	
				Transparent	A22Z-3443C	
			White text on red background	m	A22Z-3443R-2	
				STOP	A22Z-3443R-4	
			White text on black background	I	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	
	Large size		Without text	Black	A22Z-3453B	Attached to the Large-size Legend Plate Frame Material: Acrylic (See page L-56.)
				Red	A22Z-3453R	
				White	A22Z-3453W	
				Transparent	A22Z-3453C	
	For Emergency Stop Switch		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	
Character Films			No print (Round)		A22Z-3460	After printing on a film, affix to the indicator plate of the Lighted Pushbutton Switch. (The back is coated with adhesive.)
			Character print (Round)	I	A22Z-3460-1	
				m	A22Z-3460-2	
				START	A22Z-3460-3	
				STOP	A22Z-3460-4	
			No print (Square)		A22Z-3480	
Lamp Extractor			---		A22Z-3901	Rubber tool used to easily replace Lamps
Tightening Wrench			---		A22Z-3905	Tool used to tighten nuts from the back of the panel
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.

Specifications

Common to A22, A22S/W, A22K, and A22E

■ Approved Standards

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

Note: cUL: CSA C22.2 No. 14

■ Approved Standard Ratings

UL, cUL (File No. E41515)

6 A at 220 VAC, 10 A at 110 VAC

EN60947-5-1 (Low Voltage Directive)

10 A at 220 VAC

■ Ratings

Contacts (Standard Load)

Rated carry current	Rated voltage	Rated current (A)			
		AC15 (inductive load)	AC12 (resistive load)	DC13 (inductive load)	DC12 (resistive load)
10	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. Rated current values are determined according to the testing conditions. The above ratings were obtained by conducting tests under the following conditions.
(1) Ambient temperature: 20°±2°C
(2) Ambient humidity: 65±5%
(3) Operating frequency: 20 operations/minute
2. Minimum applicable load: 10 mA at 5 VDC

Contacts (Microload)

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

LED Indicators without Voltage Reduction Unit

Rated voltage	Rated current	Operating voltage
6 VDC	60 mA (20 mA)	6 VDC±5%
6 VAC	60 mA (20 mA)	6 VAC/VDC±5%
12 VAC/VDC	30 mA (10 mA)	12 VAC/VDC±5%
24 VAC/VDC	15 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 VAC/VDC
14 VAC/VDC	80 mA	12 VAC/VDC
28 VAC/VDC	40 mA	24 VAC/VDC
130 VAC/VDC	20 mA	100 VAC/VDC

Voltage-reduction Lighting

Rated voltage	Operational voltage	Applicable lamp (BA8S/13□ gold)
110 VAC	95 to 115 VAC	LED Lamp (A22-24A□)
220 VAC	190 to 230 VAC	

■ Characteristics

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

Note: 1. With no icing or condensation.

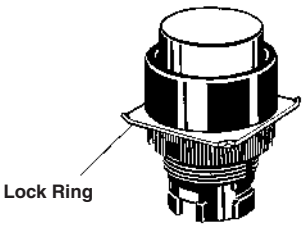
2. Malfunction within 1 ms.

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

Item	Pushbutton Switches	Emergency Stop Switches	Knob-type Selector Switches		Key-type Selector Switch	
	Lighted Non-lighted Pushbutton Switches	Push-lock turn-reset system	Manual release	Automatic release	Manual release	Automatic release
	A22-F A22-G A22-C A22-S A22-T A22-H A22-D A22-M A22L-T A22L-H A22L-D A22L-G A22L-C	A22E, A22EL	A22S, A22W	A22S, A22W	A22K	
Total travel force (TTF) max.	29.4 N	44.1 N	0.34 N·m (See note.)	0.25 N·m for two notches (See note.)	0.34 N·m (See note.)	0.25 N·m for three notches (See note.)
				0.34 N·m for three notches (See note.)		0.34 N·m for three notches (See note.)
Total travel (TT)	5.5 mm max.	10±1 mm	Approx. 90° for two notches (Approx. 45° for three notches)		Approx. 90° for two notches (Approx. 45° for three notches)	
Releasing force (RF) min.	---	0.25 N·m max. (See note.)	0.34 N·m max. (See note.)	---	0.34 N·m max. (See note.)	---

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

Nomenclature



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

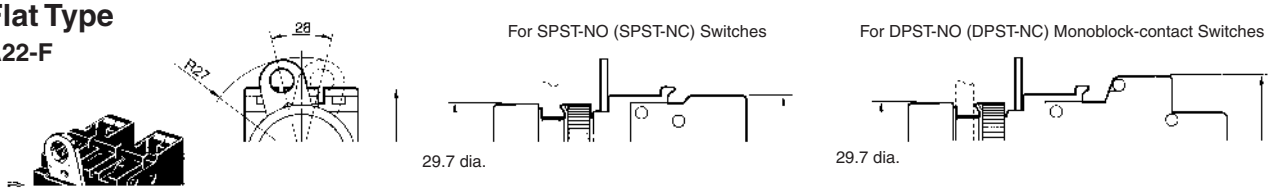
The above illustration shows a lighted model.

Dimensions

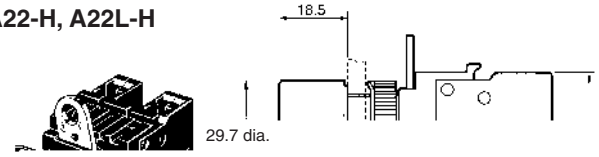
Note: 1. All units are in millimeters unless otherwise indicated.
2. The following illustrations are for momentary operation.

■ Lighted/Non-lighted Pushbutton Switches

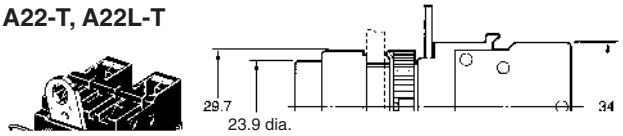
Flat Type
A22-F



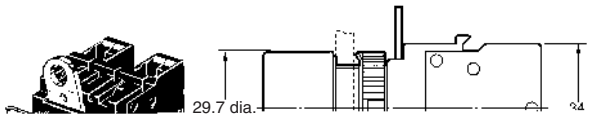
Round/Half-guard Type
A22-H, A22L-H



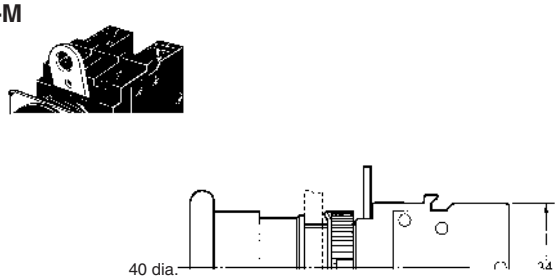
Round/Projection Type
A22-T, A22L-T



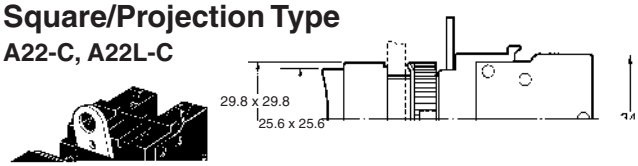
Round/Full-guard Type
A22-G, A22L-G



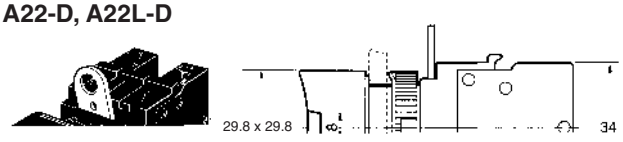
40-dia. Mushroom Type
A22-M



Square/Projection Type
A22-C, A22L-C



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



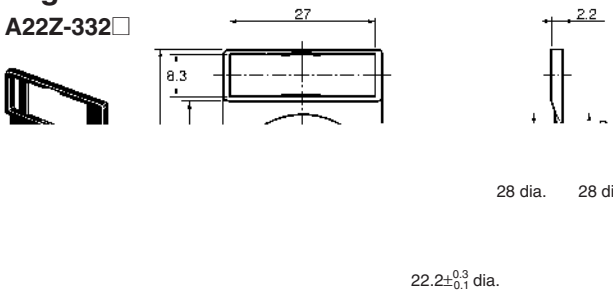
Note: 1. Alternate operation models are 9.3 mm longer.
2. Lighted models have the same dimensions as shown above, whether they are with or without Voltage Reduction Units.

■ Accessories

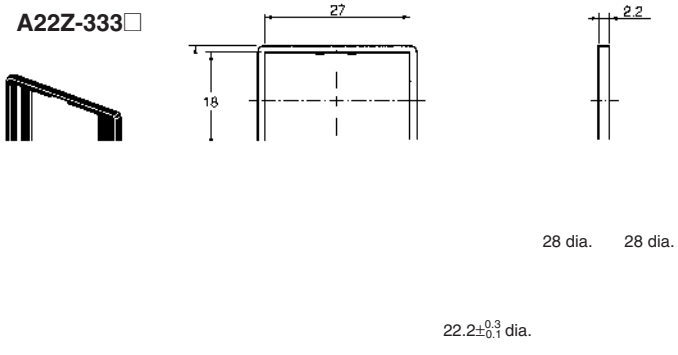
Note: All units are in millimeters unless otherwise indicated.

Legend Plate Frames

A22Z-332□

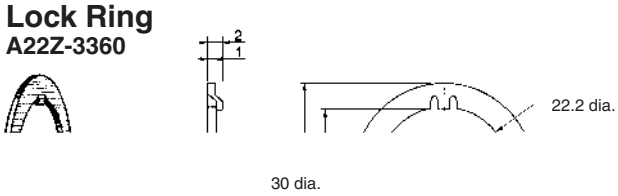


A22Z-333□



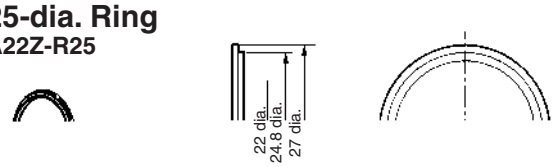
Lock Ring

A22Z-3360



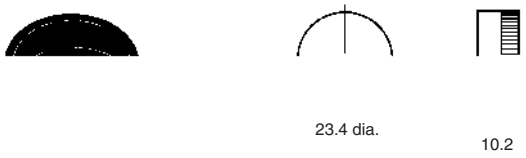
25-dia. Ring

A22Z-R25



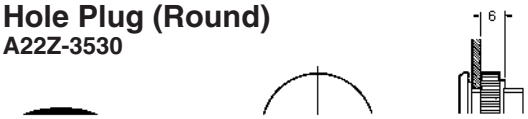
Color Cap

A22L-30T□



Hole Plug (Round)

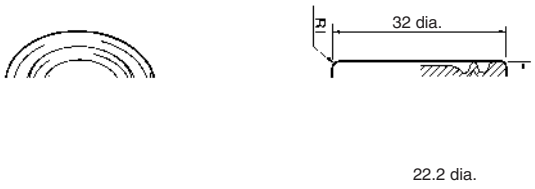
A22Z-3530



Sealing Caps

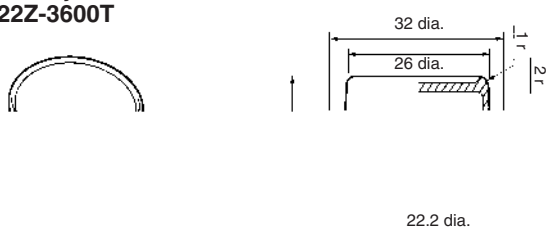
For Flat Models

A22Z-3600F



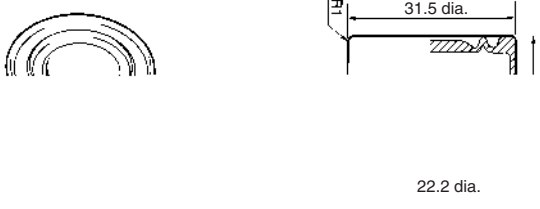
For Projection Models

A22Z-3600T



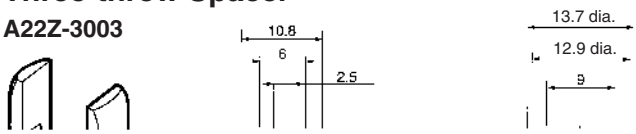
For Full-guard Models

A22Z-3600G



Three-throw Spacer

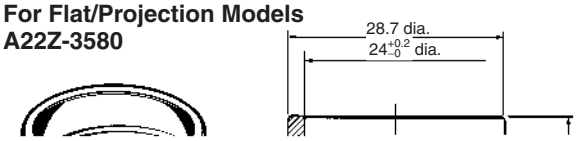
A22Z-3003



14.2 dia.

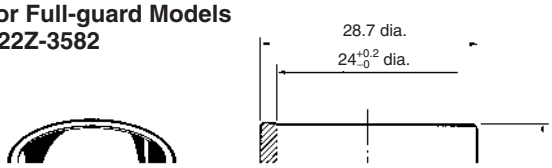
Metallic Bezel Rings

For Flat/Projection Models
A22Z-3580



29.7±0.3 dia.

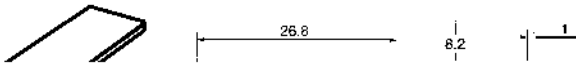
For Full-guard Models
A22Z-3582



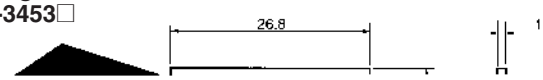
29.7±0.3 dia.

Snap-in Legend Plates

For Standard Models
A22L-3443□-□



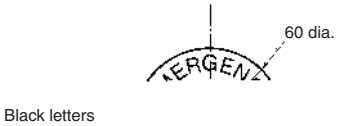
For Large Models
A22Z-3453□



For Emergency-stop Models

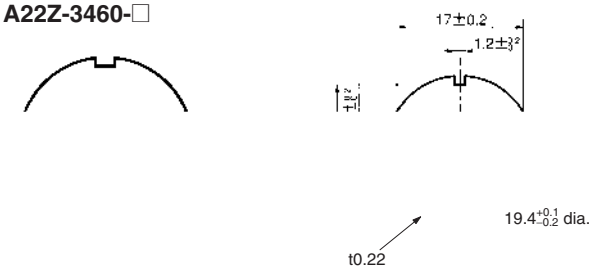
A22Z-3476-1 (90 dia.)

A22Z-3466-1 (60 dia.)

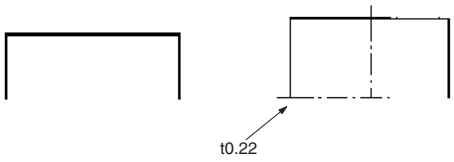


Character Film

For Round Models
A22Z-3460-□

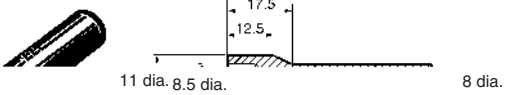


For Square Models
A22Z-3480



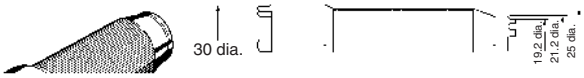
Lamp Extractor

A22Z-3901



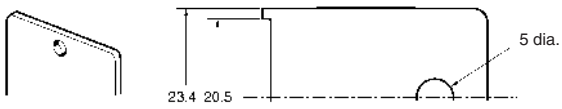
Tightening Wrench

A22Z-3905



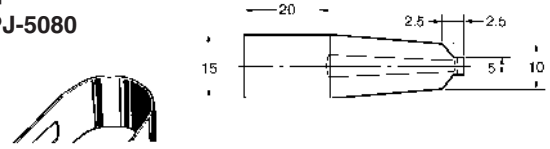
Cap Tightening Tool

A22Z-3908



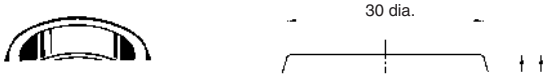
Cap Puller

A3PJ-5080



30-dia. Metal Flange

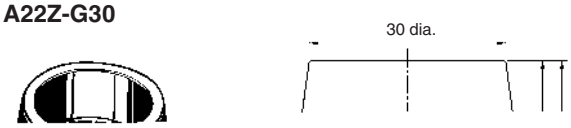
A22Z-F30



30 dia.
34.7 dia.

30-dia. Metal Flange

A22Z-G30



30 dia.
34.7 dia.

30-dia. Resin Attachment

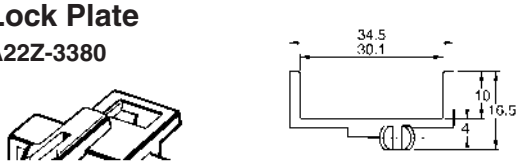
A22Z-A30

34.7 dia.

22.2 dia.

Lock Plate

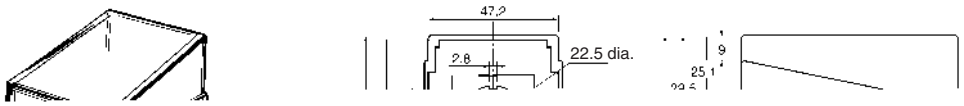
A22Z-3380



7.3 dia.

Simple Protective Cover

A22Z-3700



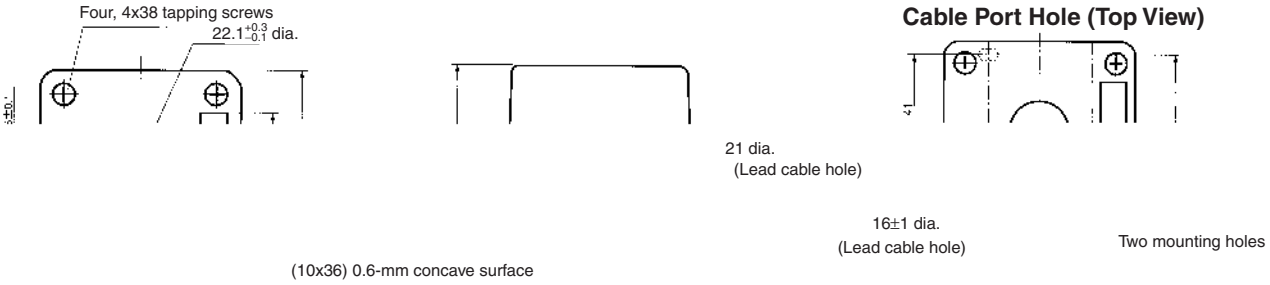
0.3 recess

30 × 30

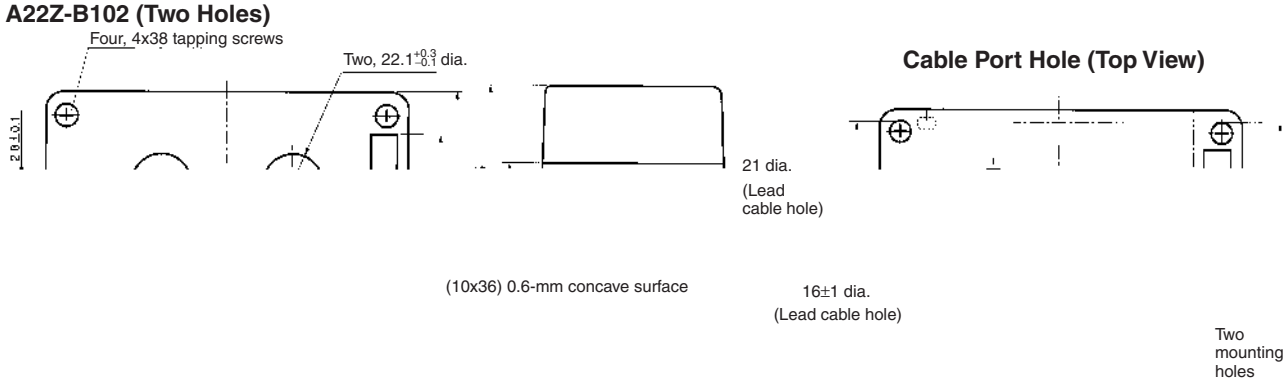
Control Box (Enclosure)

A22Z-B10□

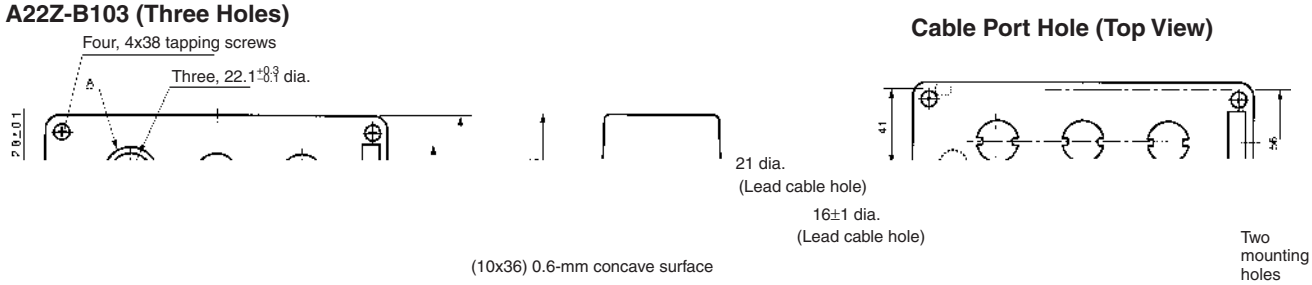
A22Z-B101 (One Hole)
A22Z-B101Y



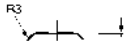
A22Z-B102 (Two Holes)



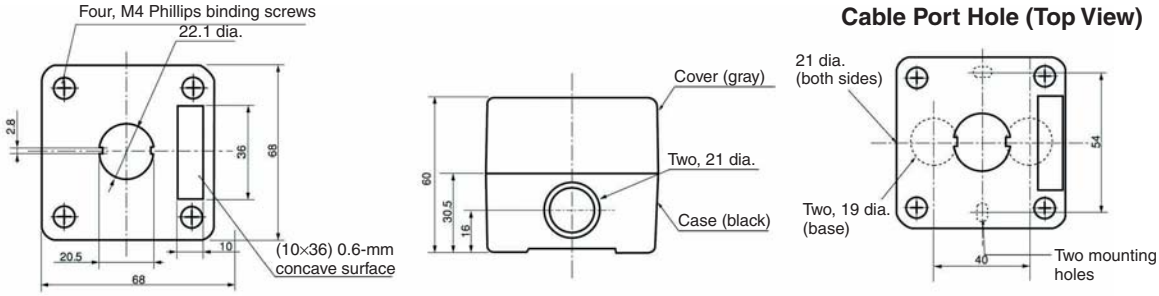
A22Z-B103 (Three Holes)



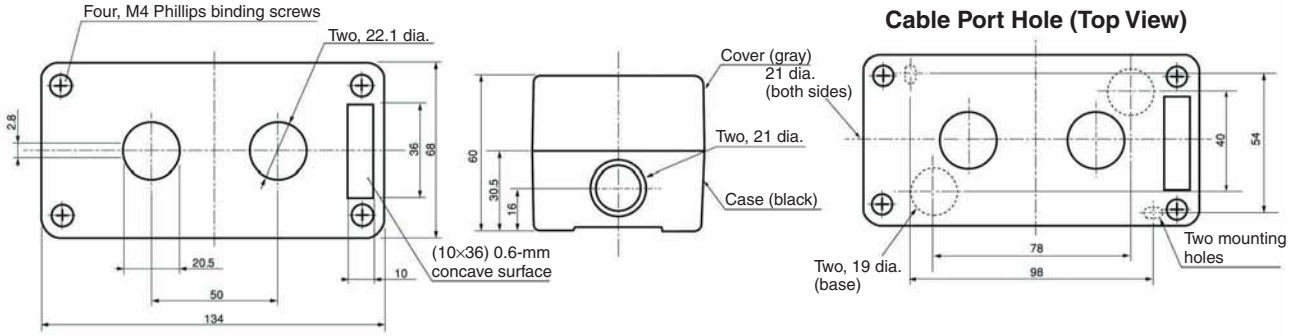
Panel Mounting Hole



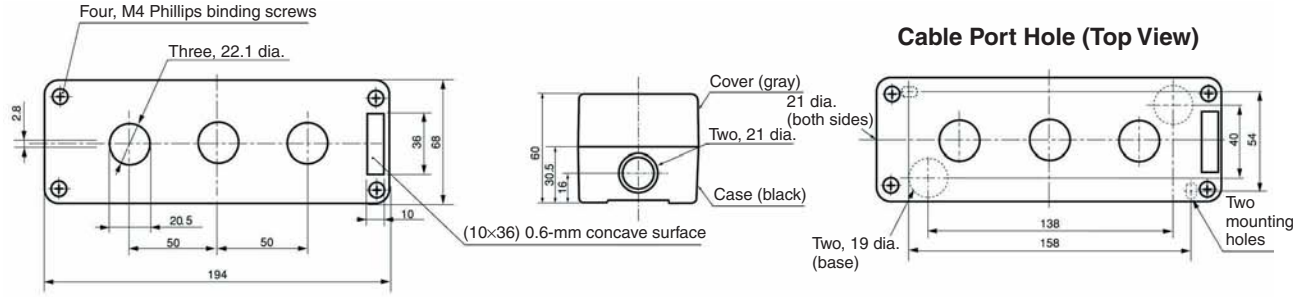
A22Z-B201 (One Hole)
A22Z-B201Y



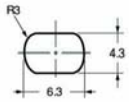
A22Z-B202 (Two Holes)



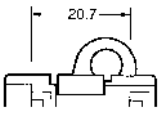
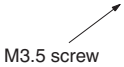
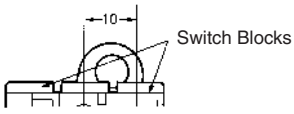
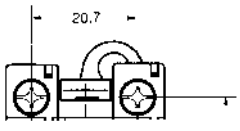
A22Z-B203 (Three Holes)



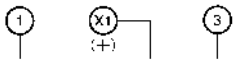
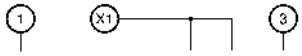
Panel Mounting Hole



■ Terminal Arrangement (Bottom View)

Non-lighted (SPST-NO + SPST-NC)	Lighted (SPST-NO + SPST-NC)	Non-lighted (DPST-NO + DPST-NC)
  Switch Blocks	 Lamp socket	 Switch Blocks

■ Terminal Connection

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

■ Panel Cutouts

$22.3^{+0.4}_{0}$ dia. $25^{+0.5}_{0}$ dia.

Note: 1. When applying coating such as paint to the panel, the dimensions should be those after the application of coating. Lock ring is provided as a standard item.

2. Recommended panel thickness: 1 to 5 mm.

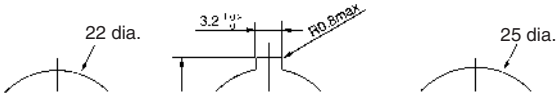
3. Use an A22Z-R25 Ring when mounting to a panel with 25-mm holes.

Installation

Common to A22, A22S/W, A22K, M22, and A22E

■ Mounting to the Panel

Panel Hole Dimensions



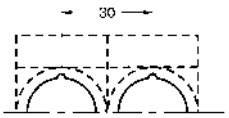
For 25-dia. holes, always use 25-dia. Rings. (Since the cutout dimensions are large, IP65 cannot be guaranteed unless 25-dia. Rings are used.)

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.

Note: Recommended panel thickness: 1 to 5 mm.

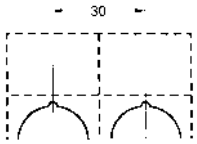
Matrix Installation

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.



A

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.



B

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 L-66 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.)

3. When using a pushbutton with external dimensions exceeding 30 mm, use a pitch appropriate for the pushbutton.

Mounting the Operation Unit on the Panel

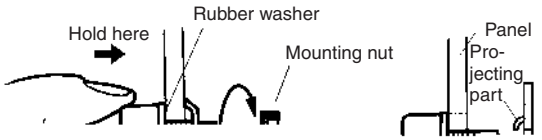
Insert the Operation Unit (Pushbutton, etc.) from the front surface of the panel, insert the Lock Ring and the mounting nut from the terminal side, then tighten the nut. Before tightening, check that the rubber washer is present between the Pushbutton Unit and the panel.

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.

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.

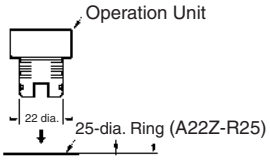


Lock Ring

Lock Ring

Panel

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.)



22.3 dia.

25 dia.

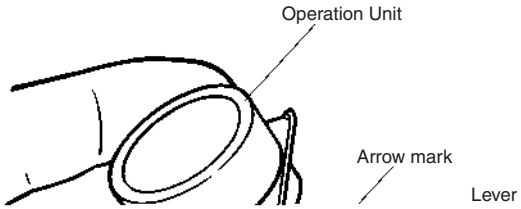
Panel 25 dia.

Lock Ring 22.3 dia.

Mounting nut

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.

Square Pushbutton/Indicator

Removing the Color Cap:
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.

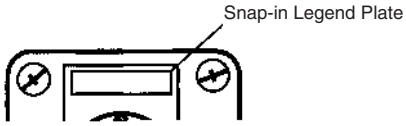
Installing/Replacing on the Switch

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

■ Control Box (Enclosure)

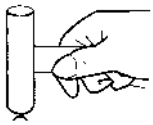
Mounting the Switch

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.



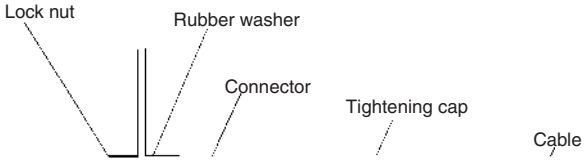
Creating a Cable Port Hole

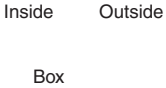
Place the tip of a screwdriver on the surface where the cable port hole is to be created with the cover attached and strike the screwdriver to punch a hole. Attempts to punch a hole on the other side of the case will damage the Box.



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.



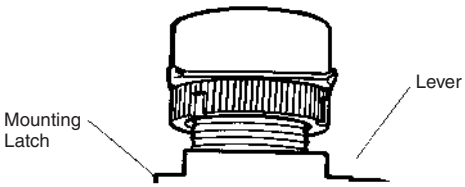


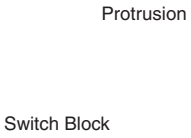
Cable diameter	Connector
7 to 9 dia.	A22Z-3500-1
9 to 11 dia.	A22Z-3500-2

■ Installing/Removing the Switch Blocks

Installing the Switch Blocks

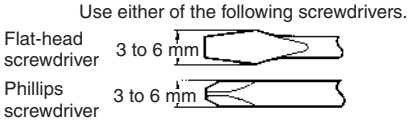
Hook the small protrusion on the Mounting Latch into the groove on the other side of the lever, then push up the Switch Block in the direction indicated by the arrow in the figure below.

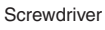




Removing the Switch Blocks

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.

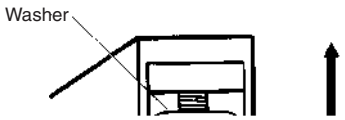




■ Wiring

Wiring Round Crimp Terminals

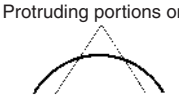
Loosen the terminal screw from the Switch Unit until it completely comes off the groove, insert a screwdriver as shown in the following figure, then push up the washer in the direction indicated by the arrow to temporarily secure it. Now, a round crimp terminal can be connected. After inserting the terminal,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



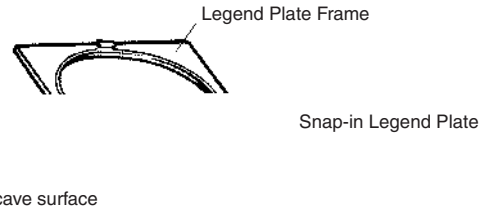
■ Affixing Character Film

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 the 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.

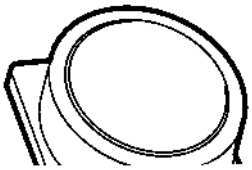
■ Mounting and Dismounting Snap-in Legend

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.

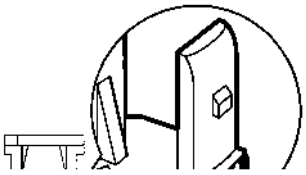
The characters must be engraved no deeper than 0.5 mm.

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 (A22Z-3003)

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.



Precautions

Common to A22, A22S/W, A22K, M22, and A22E

⚠ 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.

■ Correct Use

Mounting

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

Do not tighten the mounting 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

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

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.

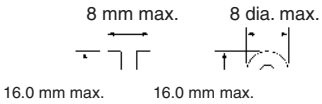
The tightening torque is 1.08 to 1.27 N·m.

Single wires, stranded wires, and crimp terminals can be connected to the Switch.

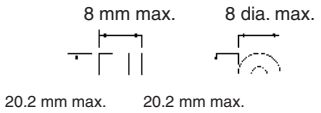
Applicable Wire Size

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

Bare Crimp Terminals



Crimp Terminals with Insulating Sheath



Operating Environment

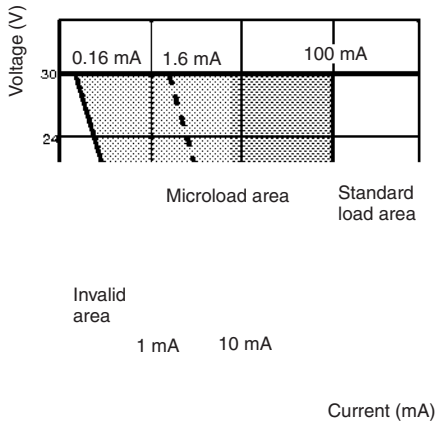
The IP65 model is designed with a degree of protection so that it will not sustain damage if it is subjected to water from any direction to the front of the panel.

Using the Microload

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

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

The equation, λ 60 = 0.5 x 10^{-6}/operations indicates that the estimated malfunction rate is less than 1/2,000,000 operations with a reliability level of 60%.



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.

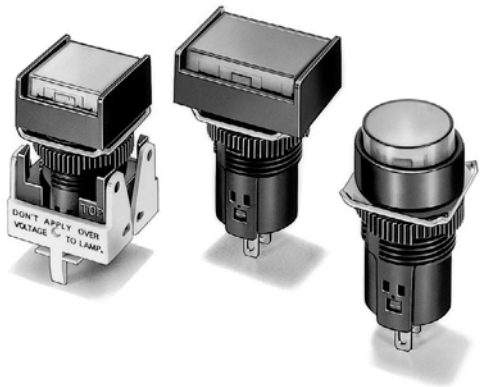
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. A128-E2-02

Indicator
M16

Cylindrical 16-dia. Indicator

- Same basic design as the A16 Pushbutton Switch.
- UL and cUL approved (File No. E41515).



Model Number Structure

■ Model Number Legend

Completely Assembled

The model numbers used to order sets of Units are illustrated below. One set comprises the Display, Case, Lamp, and Socket.

M16 (1) 5 - (2) T (3) R - (4) 24D - (5) P

(5) Terminal Type

Symbol	Terminal type
No symbol	Solder terminals
P	PCB terminals
S	Screw-Less Clamp

(1) Degree of Protection

Symbol	Protection
No symbol	IP40
5	IP65 oil-resistant

(2) Shape of Display

Symbol	Shape
J	Rectangular
A	Square
T	Round
3J	Rectangular (3-way guard)
BA	Square (24-mm square)

(3) Color of Display

Symbol	Color
R	Red
G	Green
Y	Yellow
PY	Pure yellow
W	White
A	Blue

(4) Light Source

Symbol	Type	Operating voltage	Rated voltage
5	Incandescent lamp	5 VAC/VDC	6 VAC/VDC
12		12 VAC/VDC	14 VAC/VDC
24		24 VAC/VDC	28 VAC/VDC
5D	LED	5 ±5% VDC	5 VDC
12D		12 ±5% VDC	12 VDC
24D		24 ±5% VDC	24 VDC

Voltage Reduction Unit (24-V Built-in LED)

Symbol	Type	Operating voltage	Rated voltage
T1	LED	90 to 121 VAC/VDC	110 VAC/VDC
T2		180 to 242 VAC/VDC	220 VAC/VDC

Solder terminals are available only with 100-V models.

The Voltage Reduction Unit is not available for models with PCB terminals.

Ordering Information

■ List of Models

Ordering as a Set

The model numbers used to order sets of Units are given in the following tables. One set comprises the Display, Case, Lamp, and Socket.

M16□-J (Rectangular) Models

Solder Terminal Models

Appearance	Lighting	Operating voltage	IP40	IP65 oil-resistant	Display color symbol (See note.)
	LED without Voltage Reduction Unit	5 VDC	M16-J□-5D	M165-J□-5D	R: red Y: yellow G: green A: blue W: white PY: Pure yellow
		12 VDC	M16-J□-12D	M165-J□-12D	
		24 VDC	M16-J□-24D	M165-J□-24D	
	Incandescent lamp	5 VDC/VAC	M16-J□-5	M165-J□-5	
		12 VDC/VAC	M16-J□-12	M165-J□-12	
		24 VDC/VAC	M16-J□-24	M165-J□-24	

M16□-A (Square) Models

Solder Terminal Models

Appearance	Lighting	Operating voltage	IP40	IP65 oil-resistant	Display color symbol (See note.)
	LED without Voltage Reduction Unit	5 VDC	M16-A□-5D	M165-A□-5D	R: red Y: yellow G: green A: blue W: white PY: Pure yellow
		12 VDC	M16-A□-12D	M165-A□-12D	
		24 VDC	M16-A□-24D	M165-A□-24D	
	Incandescent lamp	5 VDC/VAC	M16-A□-5	M165-A□-5	
		12 VDC/VAC	M16-A□-12	M165-A□-12	
		24 VDC/VAC	M16-A□-24	M165-A□-24	

M16□-T (Round) Models

Solder Terminal Models

Appearance	Lighting	Operating voltage	IP40	IP65 oil-resistant	Display color symbol (See note.)
	LED without Voltage Reduction Unit	5 VDC	M16-T□-5D	M165-T□-5D	R: red Y: yellow G: green A: blue W: white PY: Pure yellow
		12 VDC	M16-T□-12D	M165-T□-12D	
		24 VDC	M16-T□-24D	M165-T□-24D	
	Incandescent lamp	5 VDC/VAC	M16-T□-5	M165-T□-5	
		12 VDC/VAC	M16-T□-12	M165-T□-12	
		24 VDC/VAC	M16-T□-24	M165-T□-24	

Note: Enter the desired color symbol for the Display in □.

Ordering Individually

Displays, Cases, Lamps, and Sockets can be ordered separately. Combinations that are not available as sets can be created using individual parts. Also, store the parts as spares for maintenance and repairs.

Display (Refer to page L-70.)

Rectangular

Square

Round

Note: Use IP40 Displays in combination with IP40 Sockets and use IP65 Displays in combination with IP65 Sockets.

Case (Refer to page L-71.)

Note: Display Units, which are combinations of Displays and Cases, are also available.

Lighted Models

Lamp (Refer to page L-70.)

LED

Incandescent Lamp

Neon Lamp

Socket (Refer to page L-71.)

Solder Terminals
(Without Voltage Reduction Unit)

Note: Socket Units, which are combinations of Lamps and Sockets, are also available.

Display

For LED-lighted Models

Sealing / Appearance / Color of Display	IP40			IP65 oil-resistant		
	Rectangular 	Square 	Round 	Rectangular 	Square 	Round 
Red	A16L-JR	A16L-AR	A16L-TR	A165L-JR	A165L-AR	A165L-TR
Yellow	A16L-JY	A16L-AY	A16L-TY	A165L-JY	A165L-AY	A165L-TY
Pure yellow	A16L-JPY	A16L-APY	A16L-TPY	A165L-JPY	A165L-APY	A165L-TPY
Green	A16L-JGY	A16L-AGY	A16L-TGY	A165L-JGY	A165L-AGY	A165L-TGY
White	A16L-JW	A16L-AW	A16L-TW	A165L-JW	A165L-AW	A165L-TW
Blue	A16L-JA	A16L-AA	A16L-TA	A165L-JA	A165L-AA	A165L-TA

Incandescent Lamps (With the exception of green, the Units are the same as for LEDs.)

Sealing / Appearance / Color of Display	IP40			IP65 oil-resistant		
	Rectangular 	Square 	Round 	Rectangular 	Square 	Round 
Red	A16L-JR	A16L-AR	A16L-TR	A165L-JR	A165L-AR	A165L-TR
Yellow	A16L-JY	A16L-AY	A16L-TY	A165L-JY	A165L-AY	A165L-TY
Pure yellow	A16L-JPY	A16L-APY	A16L-TPY	A165L-JPY	A165L-APY	A165L-TPY
Green	A16L-JG	A16L-AG	A16L-TG	A165L-JG	A165L-AG	A165L-TG
White	A16L-JW	A16L-AW	A16L-TW	A165L-JW	A165L-AW	A165L-TW
Blue	A16L-JA	A16L-AA	A16L-TA	A165L-JA	A165L-AA	A165L-TA

Neon Lamps

Sealing / Appearance / Color of Display	IP40			IP65 oil-resistant		
	Rectangular 	Square 	Round 	Rectangular 	Square 	Round 
Red	A16L-JRN	A16L-ARN	A16L-TRN	A165L-JRN	A165L-ARN	A165L-TRN
Green	A16L-JGN	A16L-AGN	A16L-TGN	A165L-JGN	A165L-AGN	A165L-TGN
White	A16L-JWN	A16L-AWN	A16L-TWN	A165L-JWN	A165L-AWN	A165L-TWN

Lamp

LED

	Color	Operating voltage		
		5 VDC	12 VDC	24 VDC
	Red	A16-5DSR	A16-12DSR	A16-24DSR
	Yellow	A16-5DSY	A16-12DSY	A16-24DSY
	Green	A16-5DSG	A16-12DSG	A16-24DSG
	White (See note.)	A16-5DSW	A16-12DSW	A16-24DSW
	Blue	A16-5DA	A16-12DA	A16-24DA

Note: Use the white LED when the required illumination color is white or pure yellow.

Incandescent Lamp

	Operating voltage	5 VAC/VDC	12 VAC/VDC	24 VAC/VDC
	Model	A16-5	A16-12	A16-24

Neon Lamp

	Color of lamp	Color of Display	Operating voltage	
			100 VAC	200 VAC
	Red	White, red	A16-1NRN	A16-2NRN
	Green	Green	A16-1NGN	A16-2NGN

Case

Appearance	Classification		Model number
	IP40	Rectangular	A16-CJM
		Square	A16-CAM
		Round	A16-CTM
	IP65 oil-resistant	Rectangular	A165-CJM
		Square	A165-CAM
		Round	A165-CTM

Socket

Appearance	Classification			Model number
	Solder terminals			M16-0
	PCB terminals			M16-0P
	Screw-Less Clamp			M16-S
Solder terminals	Solder terminals	Voltage-reduction lighting	100 V	M16-T1
	Screw-Less Clamp		100 V	M16-T1-S
			200 V	M16-T2-S

Specifications

■ Approved Standards

Agency	Standards	File No.
UL, cUL (See note.)	UL508	E41515

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

■ Ratings

Super-bright LED

Rated voltage	Rated current	Operating voltage	Built-in limiting resistance
5 VDC	30 mA (15 mA)	5 VDC ±5%	33 Ω (68 Ω)
12 VDC	15 mA	12 VDC ±5%	270 Ω (560 Ω)
24 VDC	10 mA	24 VDC ±5%	1,600 Ω (2,000 Ω)

Note: The values in parentheses are for blue Pushbuttons.

Incandescent Lamp

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

Neon Lamp

Rated voltage	Rated current	Operating voltage
110 VAC	1.5 mA	100 VAC ±10%
220 VAC	1.5 mA	200 VAC ±10%

■ Characteristics

Ambient operating temperature	-10°C to 55°C (with no icing or condensation)
Ambient operating humidity	35% to 85%
Ambient storage temperature	-25°C to 65°C

Note: Characteristics not provided above are the same as those for the A16.

Screw-less Clamp

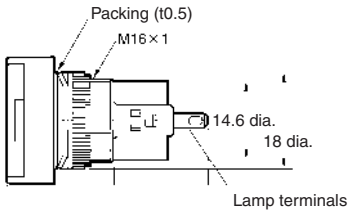
Item		Screw-less Clamp			
Recommended wire size		0.5 mm² twisted wire or 0.8 mm-dia. solid wire			
Usable wires and tensile strength	Twisted wire	0.3 mm²	0.5 mm²	0.75 mm²	1.25 mm²
	Solid wire	0.5 mm dia.	0.8 mm dia.	1.0 mm dia.	---
	Tensile strength	10 N	20 N	30 N	40 N
Length of exposed wire		10 ±1 mm			

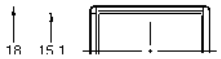
Dimensions

Note: 1. All units are in millimeters unless otherwise indicated.
2. Refer to page L-74 for details of panel cutout dimensions.

Rectangular
M16-J

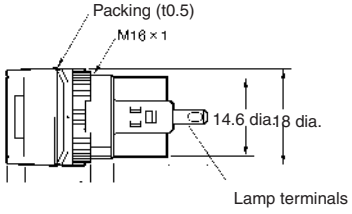
Solder terminals

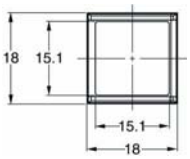




Square
M16-A

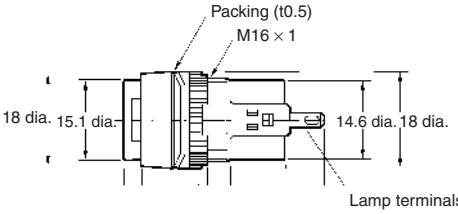
Solder terminals

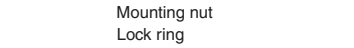


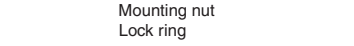


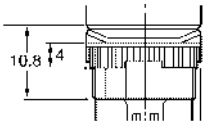
Round
M16-T

Solder terminals

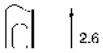


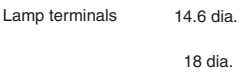






Terminal Hole Dimensions

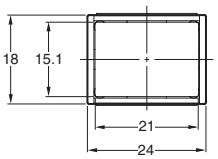


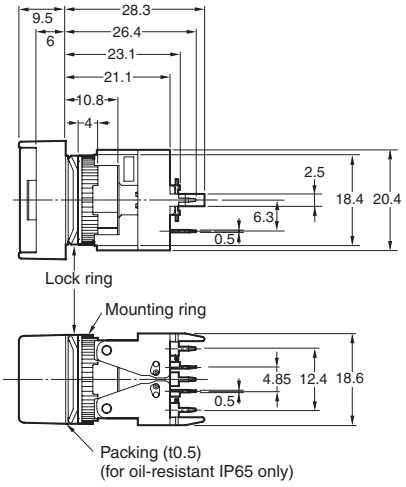


Rectangular
M16□-P

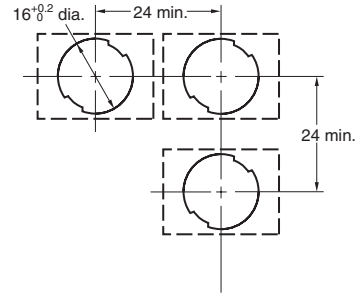
PCB terminals

The rectangular model is given here as a representative example.
Lamp terminals are provided even for non-lighting applications.





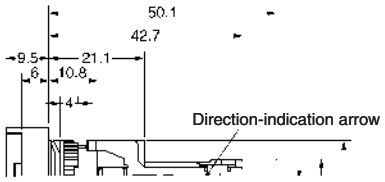
Panel Cutouts



Recommended panel thickness: 0.5 to 3.2 mm

Rectangular
M16□-T1, T2

Voltage-reduction lighting,
solder terminals



Display

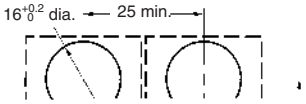
Case

Marking face

Packing (t0.5)
(for oil-resistant IP65 only)

Lock ring
Mounting ring
Socket

Panel Cutouts

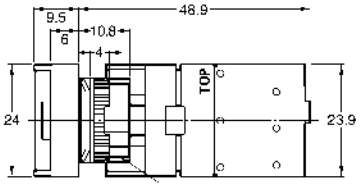


23 min.
(Dimension A)

Recommended panel thickness: 0.5 to 3.2 mm

Rectangular
M16□-S

Screw-Less Clamp



Socket dismounting lever

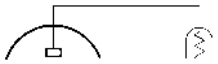
Lock ring
Mounting ring

Packing (t0.5)
(for oil-resistant IP65 only)

■ Terminal Arrangement

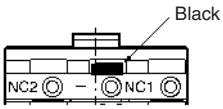
Solder Terminals

Bottom View



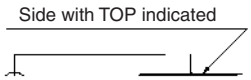
Note: The L+ is not shown on the Socket Unit.

Screw-Less Clamp



Bottom View

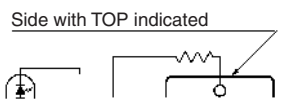
Side with TOP indicated



Voltage-reduction Lighting

Bottom View

Side with TOP indicated



Note: Voltage-reduction lighting models with Screw-Less Clamps (A16L-□T1-2S, A16L-□T2-2S) incorporate voltage-reduction circuits.

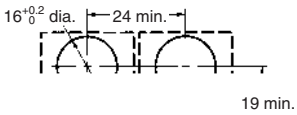
■ Panel Cutouts

Solder Terminals

Solder Terminals

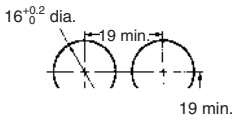
Rectangular M16□-J

(Top View)



Square M16□-A
Round M16□-T

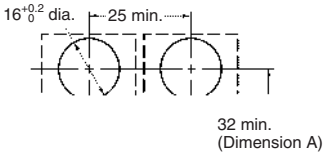
(Top View)



Screw-Less Clamp

Rectangular
M16□-S

(Top View)



Note: 1. Make sure the thickness of the mounting panel is 0.5 to 3.2 mm. If, however, a Switch Guard or Dust Cover is used, the thickness of the mounting panel must be 0.5 to 2 mm.

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

Installation

Refer to the *Installation* section for the A16.

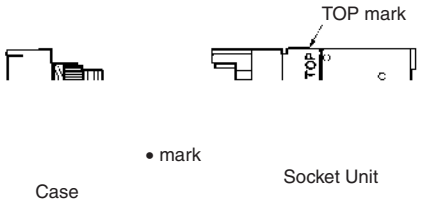
Precautions

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

■ Correct Use

Mounting

When mounting the Case onto the Socket Unit, ensure that the orientation is correct. Perform mounting with the • mark on the Case and the TOP mark on the Socket Unit facing in the same direction.



Wiring

When using stranded wire, gather the ends of the strands together before wiring.

When wiring, insert the wire until it comes into contact with something. After wiring is completed, pull on the wires to confirm that they are connected securely.

After wiring, ensure that continuous pressure is not applied to the terminals.

Refer to internal connections diagrams and confirm the terminal numbers before performing wiring.

Screw-Less Clamps

Mounting Procedure

1. Strip a length of 10 mm off the end of the wire (allowable range: 10±1 mm).
2. Bunch wire strands together and straighten them.
3. Insert the wire into the insertion hole while pressing the release button at the side of the hole. (Using a precision screwdriver is recommended.)
4. Let go of the release button to lock the wire into place.
5. After locking, pull on the wire gently to confirm that it is securely locked.

Removing Procedure

Remove wires by pulling them while pressing the release button.

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

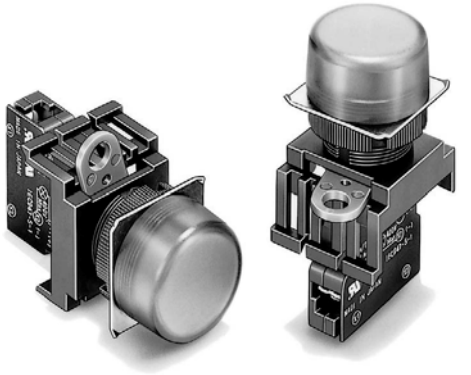
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. A127-E2-02

Indicator
M22

22-dia. and 25-dia. Round Indicator Series

- Easy mounting and removal of Socket Unit.
- Use 25-dia. ring to install in 25-dia. panel cutouts.
- Finger protection mechanism on Lamp provided as a standard feature.
- UL and cUL approved (File No. E41515)



Model Number Structure

■ Model Number Legend

Completely Assembled

Shipped as a set which includes the Display, Lamp, and Socket Unit.

M22-□□-□ (1 2 3)

1 Flange Shape

Code	Description
F	Round/Flat
C	Square/Projection

2 Illumination Color

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

3 Light Source

Code	Operating voltage	
Without Voltage Reduction Unit		
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
H1		100 VAC/VDC
With Voltage Reduction Unit		
T1	LED	110 VAC
T2		220 VAC

Note: The LED lamp (24 VAC/VDC) can be lit by directly applying 110 VAC/VDC (220 VAC/VDC) to the lamp terminal. LED incorporates the 24-VAC/VDC type.

Subassembled

The Display, Lamp, or Socket Unit 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.

1. Display

M22-□□
1 2

1 Flange Shape

Code	Description
F	Round/Flat
C	Square/Projection

2 Cap Color

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

2. Lamp

A22-□□
1 2

1 Operating Voltage (Rated Voltage)

Incandescent	
Code	**Description**
5	5 VAC (6 VAC)
12	12 VAC (14 VAC)
24	24 VAC (28 VAC)
H1	100 VAC (130 VAC)
LED	
6D	6 VDC (6 VDC)
6A	6 VAC (6 VAC)
12A	12 VAC/VDC (12 VAC/VDC)
24A	24 VAC/VDC (24 VAC/VDC)

2 Illumination Color

Code	Description
None	Incandescent lamp
R	Red
G	Green
Y	Yellow
A	Blue

3. Socket Unit

M22-00-□
1

1 Voltage Reduction Unit

Code	Description
None	Without Voltage Reduction Unit
T1	110 VAC
T2	220 VAC

Ordering Information

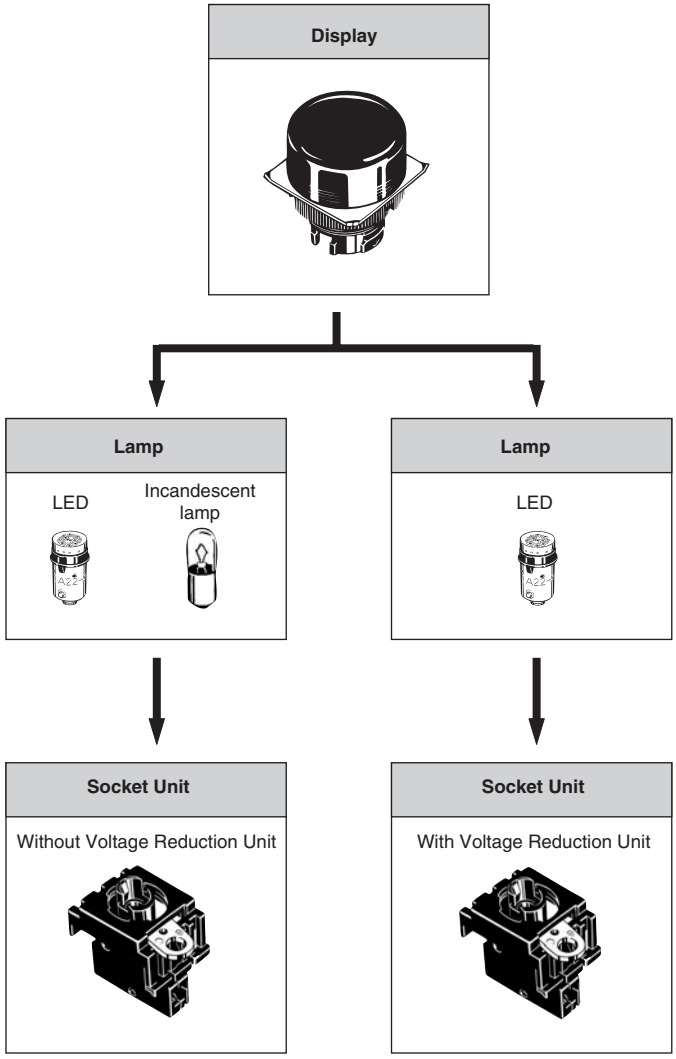
■ List of Models

Completely Assembled

Indicator

Appearance	Lighting	Operating voltage	Model	Illumination color
Round/Flat without Voltage Reduction Unit  M22-F	LED	6 VDC	M22-F□-6D	Insert one of the following letters into the box □. R (red) Y (yellow) G (green) W (white) A (blue)
		6 VAC	M22-F□-6A	
		12 VAC/VDC	M22-F□-12A	
		24 VAC/VDC	M22-F□-24A	
Round/Flat with Voltage Reduction Unit  M22-F		110 VAC	M22-F□-T1	
		220 VAC	M22-F□-T2	
Square/Projection without Voltage Reduction Unit  M22-C		6 VDC	M22-C□-6D	
		6 VAC	M22-C□-6A	
		12 VAC/VDC	M22-C□-12A	
		24 VAC/VDC	M22-C□-24A	
Square/Projection with Voltage Reduction Unit  M22-C		110 VAC	M22-C□-T1	
		220 VAC	M22-C□-T2	

Subassembled



Display

Appearance	IP65 oil-resistant	
	Color of Display	Model
Round/Flat  M22-F	Red	M22-FR
	Green	M22-FG
	Yellow	M22-FY
	White	M22-FW
	Blue	M22-FA
Square/Projection  M22-C	Red	M22-CR
	Green	M22-CG
	Yellow	M22-CY
	White	M22-CW
	Blue	M22-CA

Lamp

LED

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

Note: 1. For voltage-reduction lighting, use the A22-24A□.
2. Used when the Display color is yellow or white.

Incandescent

Operating voltage	6 VAC/VDC	12 VAC/VDC	24 VAC/VDC	100 VAC/VDC
	A22-5	A22-12	A22-24	A22-H1

Socket Unit

Voltage-reduction circuits		
Without Voltage Reduction Unit	With Voltage Reduction Unit	
		
Without Voltage Reduction Unit	With Voltage Reduction Unit (110 VAC)	With Voltage Reduction Unit (220 VAC)
M22-00	M22-00-T1	M22-00-T2

Note: For voltage-reduction lighting, use the A22-24A□.

Accessories (Order Separately)

The M22 uses the same accessories as the A22. Refer to the relevant information in the corresponding section for the A22.

Specifications

■ Approved Standards

Recognized organization	Standards	File No.
UL, cUL (see note)	UL508	E41515

Note: cUL: CSA C22.2 No. 14

■ Approved Standard Ratings

UL, cUL (File No. E41515)

2-6W, 120 V max.

■ Ratings

LED Lamp

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	15 mA (10 mA)	24 VAC/VDC±5%

Note: The values in parentheses are for blue Indicators.

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
130 VAC/VDC	20 mA	100 V

Voltage-reduction Lighting

Rated voltage	Operational voltage	Applicable lamp (BA9S/13□ gold)
110 VAC	95 to 115 VAC	LED lamp (A22-24□)
220 VAC	190 to 230 VAC	

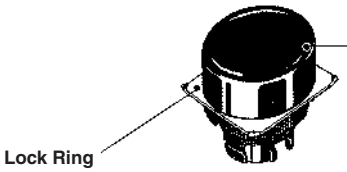
■ Characteristics

Item		Indicator
		M22
Insulation resistance		100 MΩ min. (at 500 VDC)
Dielectric strength		2,500 VAC, 50/60 Hz for 1 min between terminals of same polarity 2,500 VAC, 50/60 Hz for 1 min between terminals of different polarity and also between each terminal and ground
Vibration resistance		Malfunction (See note 2.): 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Mechanical	1,000 m/s^2
	Malfunction (See note 2.)	600 m/s^2 max.
Ambient temperature (See note 1.)		Operating: -20°C to 55°C Storage: -40°C to 70°C
Ambient humidity		Operating: 35°C to 85°C
Degree of protection		IP65
Electric shock protection class		Class II
PTI (tracking characteristic)		175
Degree of contamination		3 (IEC947-5-1)

Note: 1. With no icing or condensation.

2. Malfunction within 1 ms.

Nomenclature



Display

- **Available Colors**
  Red, green yellow, white, blue

Lamp

- **Light Source**
  LED lamp
  Incandescent lamp

Socket Unit

- **Lighting Method**
  Lighted (without Voltage Reduction Unit)
  Lighted (with Voltage Reduction Unit)

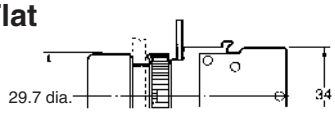
Dimensions

Note: All units are in millimeters unless otherwise indicated.

■ Indicators

Round/Flat

M22-F



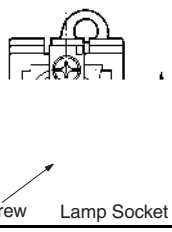
Square/Projection

M22-C

■ Accessories

The M22 uses the same accessories as the A22. Refer to the relevant information in the corresponding section for the A22.

■ Terminal Arrangement (Bottom View)

With/Without Voltage Reduction Unit


■ Terminal Connection

Without Voltage Reduction Unit	With Voltage Reduction Unit
Bottom view 	Top view 

■ Panel Cutouts (Top View)

$22.3^{+0.4}_{0}$ dia. $25^{+0.5}_{0}$ dia.

Note: 1. When applying coating such as paint to the panel, the dimensions should be those after the application of coating. Lock Ring is provided as a standard item.

2. Recommended panel thickness: 1 to 5 mm.

3. Use an A22Z-R25 Ring when mounting to a panel with 25 mm holes.

Installation

The M22 uses the same installation method as the A22. Refer to the relevant information in the *Installation* section for the A22.

Precautions

The precautions for the M22 are the same as those for the A22. Refer to the relevant information in the *Precautions* section for the A22 and the *Technical Information for Pushbutton Switches* (Cat. No. A143).

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

Cat. No. A131-E2-02