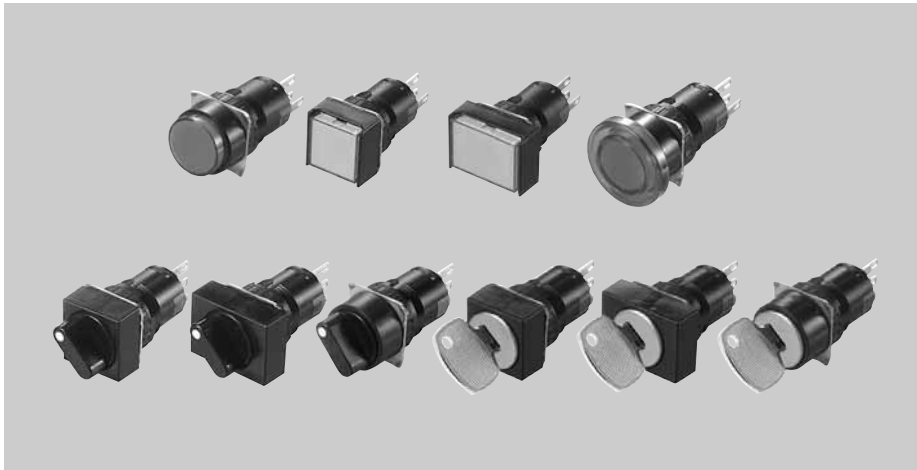


**Panasonic**  
ideas for life

Illuminated pushbutton,  
Indicators, Non-illuminated  
pushbutton, Selector,  
Key selector switches

NS Series

Full lineup to meet varied market needs  
Integrated 30 mm short body



**FEATURES**

1. Unique “Fine-mechanism” high performance contact construction realizes “fine-touch” comfortable operation feel.  
Covers wide range applications from consumer devices to FA equipment.
2. LED illuminating unit has built-in resistor and diode for controlling current inside the LED bulb.
3. Splashproof type protective construction (IP65).
4. Contacts made of cadmium-free material. (Gold-clad contact)
5. UL and CSA certified.

Compliance with RoHS Directive

**ORDERING INFORMATION**

1. Illuminated pushbutton switches (LED illumination) and indicators (indicator lamps)

ACEA  2

Flange shapes  
(With transparent button type)  
2: 18 dia. projecting type  
3: 18 square flat type  
4: 18 × 24 flat type  
(With mushroom button type)  
0: 24 dia.

Protective construction  
2: IP65

No. of poles and operating characteristics  
0: Indicator (indicator lamp)  
1: Single-pole (1 Form C) momentary  
2: Double-pole (2 Form C) momentary  
3: Single-pole (1 Form C) alternate  
4: Double-pole (2 Form C) alternate

Contact material  
0: Indicator (indicator lamp) (No contact)  
2: Low-level circuit type (Gold-clad contact)

LED voltages and pushbutton colors

Pushbutton color		Color					
		Red	Orange	Yellow	Green	Blue	White (LED: opaque)
LED voltage	5 V DC	1R	4J	4Y	7G	7L	4X
	12 V AC/DC	2R	5J	5Y	8G	8L	5X
	24 V AC/DC	3R	6J	6Y	9G	9L	6X

Color cap types

Nil: Regular K: Mushroom button type \* There is no mushroom button type in the indicator (indicator lamp).

# NS Series (ACEA, ACBA, ACSA, ACKA)



Discontinued as of August 31, 2011

## 2. Pushbutton switches (non-illuminated types and transparent buttons However, the mushroom button type is not clear.)

**ACBA**

Flange shapes  
(With transparent button type)  
2: 18 dia. projecting type  
3: 18 square flat type  
4: 18 × 24 flat type  
(With mushroom button type)  
0: 24 dia.

Protective construction  
2: IP65

No. of poles and operating characteristics  
5: Single-pole (1 Form C) momentary  
6: Double-pole (2 Form C) momentary  
7: Single-pole (1 Form C) Alternate  
8: Double-pole (2 Form C) Alternate

Contact material  
2: Low-level circuit type (Gold-clad contact)

Types of color caps  
0: Transparent button    K: Mushroom button

Pushbutton colors

Pushbutton color	Red	Orange	Yellow	Green	Blue	White	Black
Part No.	R	J	Y	G	L	X	B

Note: Mushroom button type is not available in orange.

## 3. Selector switches

**ACSA**

Flange shapes  
3: 18 square flat type  
4: 18 × 24 flat type  
5: 18 dia. flat type

Protective construction  
2: IP65

Operation methods  
1: 2-notch manual reset  
3: 3-notch manual reset

No. of poles  
6: 2 Form C

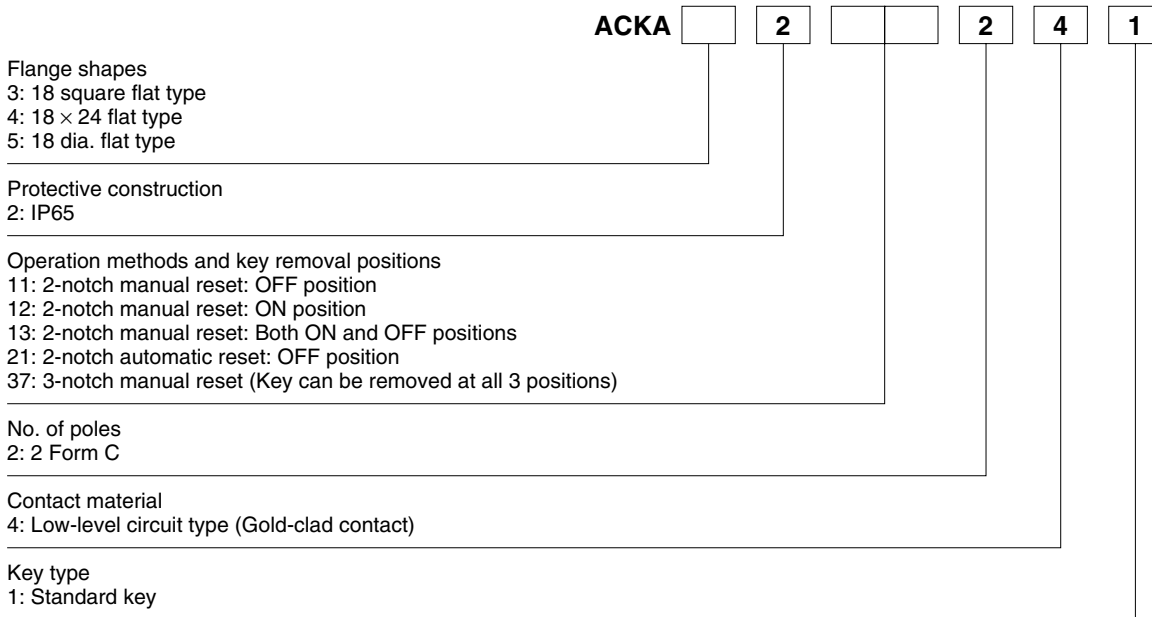
Contact material  
4: Low-level circuit type (Gold-clad contact)



Discontinued as of August 31, 2011

# NS Series (ACEA, ACBA, ACSA, ACKA)

## 4. Key selector switches



## TYPES

### 1. Illuminated pushbutton switches (LED illumination)



18 dia. projecting type



18 square flat type



18 × 24 flat type



24 dia. mushroom button type

Mounting hole	Form	No. of poles	Contact material	Splashproof type (IP65)	
				Momentary	Alternate
				Part No.	Part No.
16mm dia.	18 dia. projecting type	Single pole	Low-level circuit type (Gold-clad contact)	ACEA2212□*	ACEA2232□*
		Double poles		ACEA2222□*	ACEA2242□*
	18 square flat type	Single pole		ACEA3212□*	ACEA3232□*
		Double poles		ACEA3222□*	ACEA3242□*
	18 × 24 flat type	Single pole		ACEA4212□*	ACEA4232□*
		Double poles		ACEA4222□*	ACEA4242□*
	24 dia. mushroom button type	Single pole		ACEA0212□*K	ACEA0232□*K
		Double poles		ACEA0222□*K	ACEA0242□*K

Notes) 1. The following combinations of numbers and letters are entered in the square and in the \* symbol to indicate the LED voltage and pushbutton color.

Pushbutton color		Color					
		Red	Orange	Yellow	Green	Blue	White (Opaque LED)
LED voltage	5 V DC	1R	4J	4Y	7G	7L	4X
	12 V AC/DC	2R	5J	5Y	8G	8L	5X
	24 V AC/DC	3R	6J	6Y	9G	9L	6X

2. The white type has a colorless transparent cap.

# NS Series (ACEA, ACBA, ACSA, ACKA)



Discontinued as of August 31, 2011

## 2. Indicators (indicator lamps)



18 dia. projecting type



18 square flat type



18 x 24 flat type

Mounting hole	Form	Splashproof type (IP65)	
		Part No.	
16mm dia.	18 dia. projecting type	ACEA2200□*	
	18 square flat type	ACEA3200□*	
	18 x 24 flat type	ACEA4200□*	

Notes) 1. The following combinations of numbers and letters are entered in the square and in the \* symbol to indicate the LED voltage and pushbutton color.

Pushbutton color		Color					
		Red	Orange	Yellow	Green	Blue	White (Opaque LED)
LED voltage	5 V DC	1R	4J	4Y	7G	7L	4X
	12 V AC/DC	2R	5J	5Y	8G	8L	5X
	24 V AC/DC	3R	6J	6Y	9G	9L	6X

2. The white type has a colorless transparent cap.

## 3. Pushbutton switches (non-illuminated types and transparent buttons However, the mushroom button type is not clear.)



18 dia. projecting type



18 square flat type



18 x 24 flat type



24 dia. mushroom button type

Mounting hole	Form	No. of poles	Contact material	Splashproof type (IP65)	
				Momentary	Alternate
				Part No.	Part No.
16mm dia.	18 dia. projecting type	Single pole	Low-level circuit type (Gold-clad contact)	ACBA22520*	ACBA22720*
		Double poles		ACBA22620*	ACBA22820*
	18 square flat type	Single pole		ACBA32520*	ACBA32720*
		Double poles		ACBA32620*	ACBA32820*
	18 x 24 flat type	Single pole		ACBA42520*	ACBA42720*
		Double poles		ACBA42620*	ACBA42820*
	24 dia. Mushroom button	Single pole		ACBA0252K*	ACBA0272K*
		Double poles		ACBA0262K*	ACBA0282K*

Notes) 1. The following letter indicating the pushbutton color is entered in place of the \* symbol.

Pushbutton color	Red	Orange	Yellow	Green	Blue	White	Black
Part No.	R	J	Y	G	L	X	B

2. The white type has a colorless transparent cap.

3. The mushroom button type is not available in orange.



Discontinued as of August 31, 2011

# NS Series (ACEA, ACBA, ACSA, ACKA)

## 4. Selector switches



18 square flat type



18 x 24 flat type



18 dia. flat type

### 1) 2-notch manual reset type

Mounting hole	Form	No. of poles	Contact material	Splashproof type (IP65)	
				Part No.	
16mm dia.	18 square flat type	Double poles	Low-level circuit type (Gold-clad contact)	ACSA32164	
	18 x 24 flat type			ACSA42164	
	18 dia. projecting type			ACSA52164	

### 2) 3-notch manual reset type

Mounting hole	Form	No. of poles	Contact material	Splashproof type (IP65)	
				Part No.	
16mm dia.	18 square flat type	Double poles	Low-level circuit type (Gold-clad contact)	ACSA32364	
	18 x 24 flat type			ACSA42364	
	18 dia. projecting type			ACSA52364	

## 5. Key selector switches



18 square flat type






18 x 24 flat type




18 dia. flat type


### 1) 2-notch manual reset type

Mounting hole	Form	No. of poles	Contact material	Splashproof type (IP65)		
						
				Key removed in OFF position	Key removed in ON position	Key removed in both OFF and ON positions
16mm dia.	18 square flat type	Double poles	Low-level circuit type (Gold-clad contact)	Part No.	Part No.	Part No.
	18 x 24 flat type			ACKA3211241	ACKA3212241	ACKA3213241
	18 dia. flat type			ACKA4211241	ACKA4212241	ACKA4213241
				ACKA5211241	ACKA5212241	ACKA5213241

### 2) 2-notch automatic reset type

Mounting hole	Form	No. of poles	Contact material	Splashproof type (IP65)	
					
				Key removed in OFF position	
16mm dia.	18 square flat type	Double poles	Low-level circuit type (Gold-clad contact)	Part No.	
	18 x 24 flat type			ACKA3221241	
	18 dia. flat type			ACKA4221241	
				ACKA5221241	

### 3) 3-notch manual reset type

Mounting hole	Form	No. of poles	Contact material	Splashproof type (IP65)	
					
				Key removed in all 3 positions	
16mm dia.	18 square flat type	Double poles	Low-level circuit type (Gold-clad contact)	Part No.	
	18 x 24 flat type			ACKA3237241	
	18 dia. flat type			ACKA4237241	
				ACKA5237241	



## SPECIFICATIONS

### 1. Contact rating

#### 1) Gold-clad contact

Load	AC rating	DC rating
Resistive load	0.3 A 250 V AC	1.0 A 30 V DC
Minute load	1 mA 5 V AC/DC*	

Note) The usable range for the minute load indicated by the asterisk may fluctuate depending on the usage conditions and the type of load.

### 2. LED rating

Rated operating voltage	Operating voltage range	Rated current	LED life (reference value)	Equivalence circuit	Lighted colors
5 V DC	5 V DC±5%	8 mA	Approx. 50,000 hours (with full direct current lighting at 50% of initial intensity)		Red, orange, yellow, opaque
					Green, blue
12 V AC/DC	12 V AC/DC±10%	9 mA/8 mA			Red, orange, yellow, green, blue, opaque
24 V AC/DC	24 V AC/DC±10%	9 mA/8 mA			

Note) The current limiting resistor and protective diode are built into the LED bulb.

### 3. Characteristics

Item	Specifications
Standard usage condition	Ambient temperature: -25 to +55°C (Not freezing) (Storage temperature: -30 to +80°C) Relative humidity: 45 to 85%
Contact resistance	Max. 50 mΩ (initial)
Insulation resistance	Min. 100 MΩ (500 V DC megger)
Dielectric strength	Switch section Between metal charging part and non-metal charging part: 2,000 V AC for 1 min. Between terminals with unlike poles: 2,000 V AC for 1 min. Between terminals with like poles: 1,000 V AC for 1 min. Between contact terminals and lamp terminals: 1,500 V AC for 1 min.
	Illuminating section Between charging part and ground: 2,000 V AC for 1 min.
Vibration resistance	Malfunctioning 10 to 55 Hz at single amplitude of 0.75 mm
Shock resistance	Durability 500 m/s <sup>2</sup>
	Malfunctioning 200 m/s <sup>2</sup>
Expected life	Mechanical Momentary: Min. 10 <sup>6</sup> times Alternate: Min. 10 <sup>5</sup> times Selector switch (incl. those with keys): Min. 2.5 × 10 <sup>5</sup> times
	Electrical Min. 10 <sup>5</sup> times, switching frequency 1,200 times/hr. Alternate: Min. 5 × 10 <sup>4</sup> times
Protective construction	Splashproof and oil resistance type IP65 (IEC60529)



Discontinued as of August 31, 2011

# NS Series (ACEA, ACBA, ACSA, ACKA)

## DIMENSIONS (unit: mm)

### 1. Illuminated pushbutton switches and indicators



18 dia. projecting type



18 square flat type

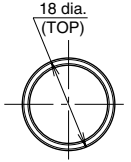


18 x 24 flat type

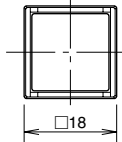


24 dia. mushroom button type

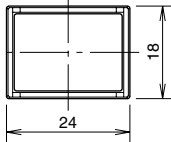
18 dia. projecting type



18 square flat type



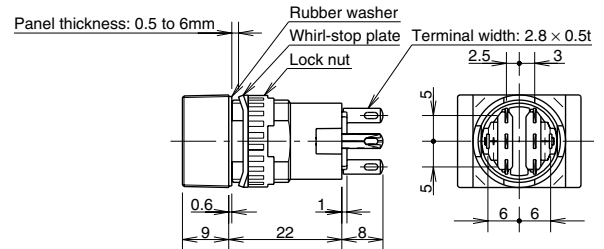
18 x 24 flat type



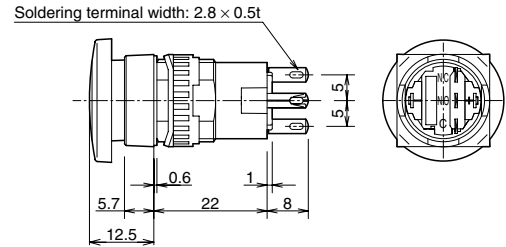
24 dia. mushroom button type



### (Illuminated pushbutton switches and indicators)



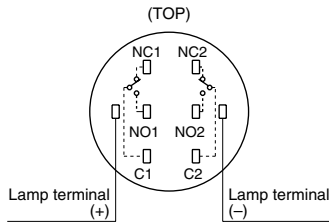
### (24 dia. mushroom button type)



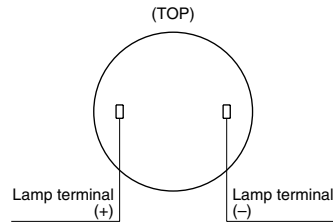
- Notes) 1. Indicators have only lamp terminals, and do not have contact terminals.  
2. There is no mushroom button type in the indicator.

## WIRING DIAGRAM (BOTTOM VIEW)

### (Illuminated pushbutton switches)



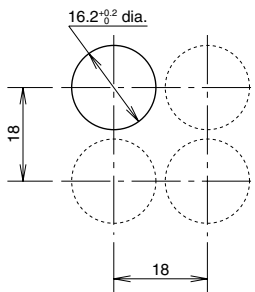
### (Indicators)



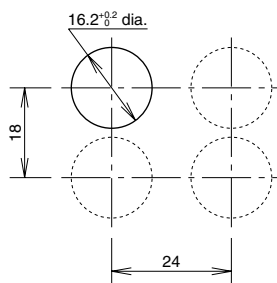
(Single pole "1 Form C" types have only the left terminal.)

## Mounting hole diagram, and recommended minimum mounting pitch

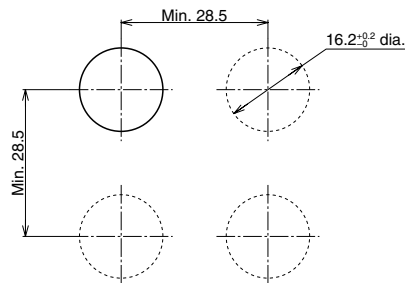
18 dia. projecting and 18 square flat types



18 x 24 flat type



Mushroom button type



Note) Operability should be taken into consideration when deciding the mounting pitch.

# NS Series (ACEA, ACBA, ACSA, ACKA)

 **Discontinued as of August 31, 2011**

## 2. Pushbutton switches



18 dia. projecting type



18 square flat type

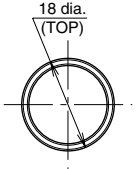


18 x 24 flat type

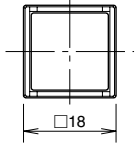


24 dia. mushroom button type

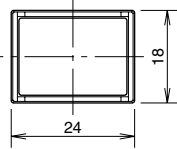
18 dia. projecting type



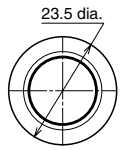
18 square flat type



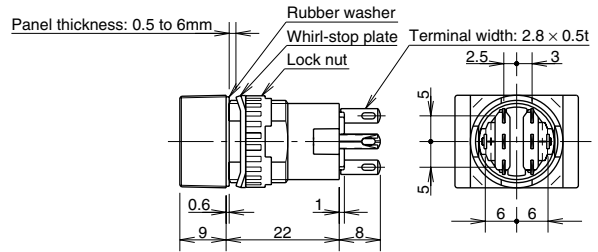
18 x 24 flat type



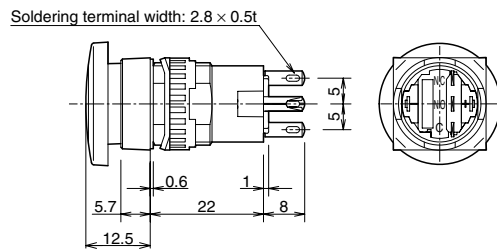
24 dia. mushroom button type



### (Illuminated pushbutton switches and indicators)

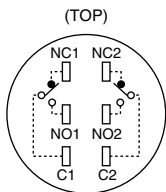


### (24 dia. mushroom button type)



Note) Pushbutton switches have only contact terminals, and do not have lamp terminals.

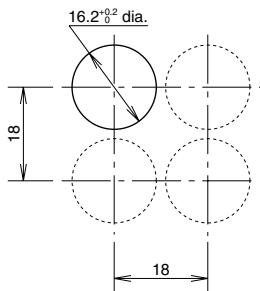
### WIRING DIAGRAM (BOTTOM VIEW) (Pushbutton switches)



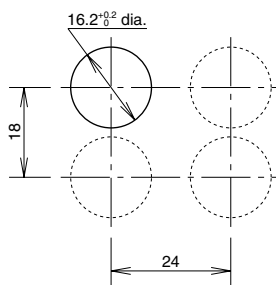
(Single pole "1 Form C" types have only the left terminal.)

### Mounting hole diagram, and recommended minimum mounting pitch

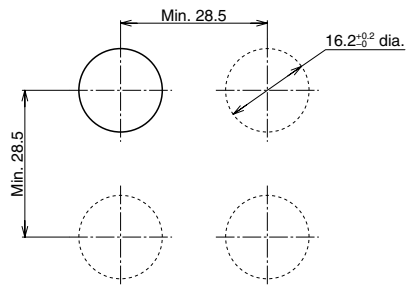
18 dia. projecting and  
18 square flat types



18 x 24 flat type



Mushroom button type



Note) Operability should be taken into consideration when deciding the mounting pitch.



Discontinued as of August 31, 2011

# NS Series (ACEA, ACBA, ACSA, ACKA)

## 3. Selector switches/Key selector switches

### 1) Selector switches



18 square flat type

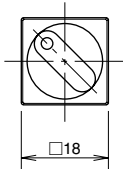


18 x 24 flat type

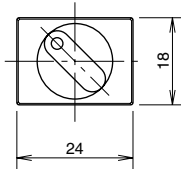


18 dia. flat type

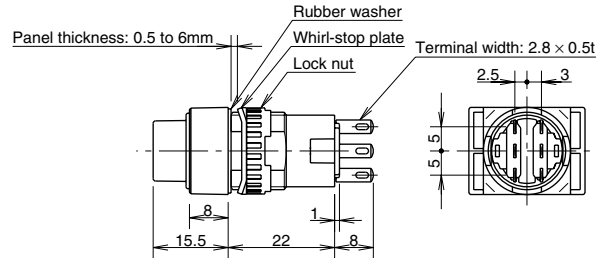
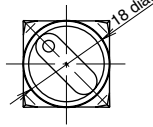
18 square flat type



18 x 24 flat type



18 dia. flat type



### 2) Key selector switches



18 square flat type

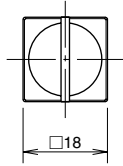


18 x 24 flat type

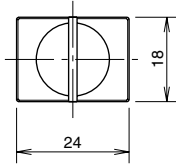


18 dia. flat type

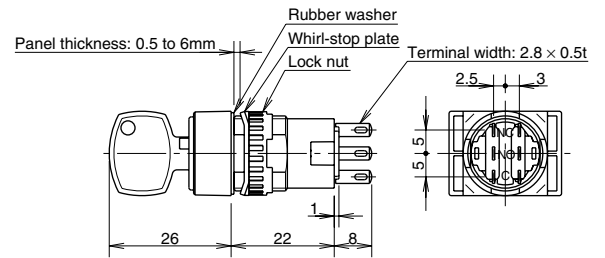
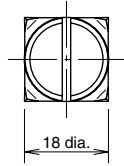
18 square flat type



18 x 24 flat type

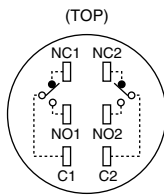


18 dia. flat type



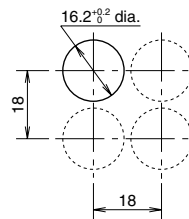
## WIRING DIAGRAM (BOTTOM VIEW)

(Selector switches/Key selector switches)

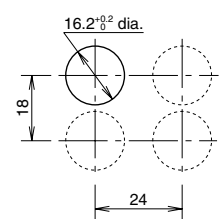


## Mounting hole diagram, and recommended minimum mounting pitch

18 dia. projecting and 18 square flat types



18 x 24 flat type



Note) Operability should be taken into consideration when deciding the mounting pitch.

## Internal circuit diagram

Notch positions (TOP VIEW)

Notch specifications		Contact arrangement	Notch positions (TOP VIEW)		
			1 (left)	0 (center)	2 (right)
90°— 2-notch	 Stopping at each position      Right return	2 contacts (2 Form C)	 Left contact NO NC      Right contact NO NC C1                              C1	/	 Left contact NO NC      Right contact NO NC C1                              C1
45°— 3-notch	 Stopping at each position	2 contacts (2 Form C)	 Left contact NO NC      Right contact NO NC C1                              C1		 Left contact NO NC      Right contact NO NC C1                              C1



Discontinued as of August 31, 2011

# NS Series Accessories and maintenance items

## Ring tightener



Part No.	ACDL1800
Specifications	Metal
Unit	1 pc.

Compliance with RoHS Directive

- This tool is convenient for tightening the lock nuts used when mounting the unit on a panel.
- When tightening rings, the torque should be between 0.68 and 0.88 N·m (7.0 to 9.0 kgf·cm).

## Lamp replacement tool



Part No.	ACDA1802
Specifications	For illuminated pushbuttons and indicators
Unit	1 pc.

- This tool is used to replace lamps when LEDs are being installed or removed.

## Removal tool



Part No.	ACDL1804
Specifications	Metal
Unit	1 pc.

- This tool is used to pull off the operating parts (color cap, inscribed plate, and holder) of illuminated pushbuttons, indicators, and pushbutton switches.

## LEDs (parts for maintenance)



Part No.	ACDA1861□*	ACDA1861□*	ACDA1861□*
Rated operating voltage	5 V DC±5%	12 V AC/DC±10%	24 V AC/DC±10%
Rated current	8 mA	9 mA/8 mA	9 mA/8 mA
Unit	10 pcs.		

Note) The following number/letter combinations indicating the LED voltage and pushbutton color should be entered in the square indicated by the asterisk after the part number.

Pushbutton color		Red	Orange	Yellow	Green	Blue	White
LED voltage	5 V DC	1R	4J	4Y	7G	7L	4X
	12 V AC/DC	2R	5J	5Y	8G	8L	5X
	24 V AC/DC	3R	6J	6Y	9G	9L	6X

- For illuminated pushbuttons and indicators (indicator lamps), the LED is built-in. These LEDs should be ordered only if spares are required.
- The asterisk in the pack part number is where the letter to indicate the lamp color is inserted.

Maintenance parts should be installed by an engineer with specialized expertise in electrical components. When placing orders, please specify the number of marketing units.



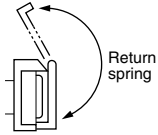
Discontinued as of August 31, 2011

# NS Series Accessories and maintenance items

## Protective cover



- This cover is designed to prevent erroneous operation.
- The cover opens 180°, and closes by means of a return spring.
- Protective construction: Spray-resistant type (IP65)

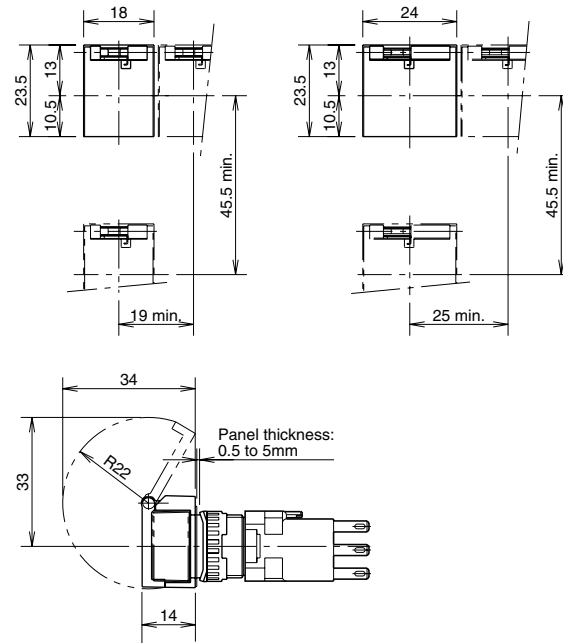


Type	For 18 dia./ 18 square	For 18 × 24
Part No.	ACDL1810	ACDL1811
Unit	10 pcs.	

### DIMENSIONS (unit: mm)

18 dia. 18 square (ACDL1810)

18 × 24 (ACDL1811)



Protective cover installation diagram

## Dustproof cover



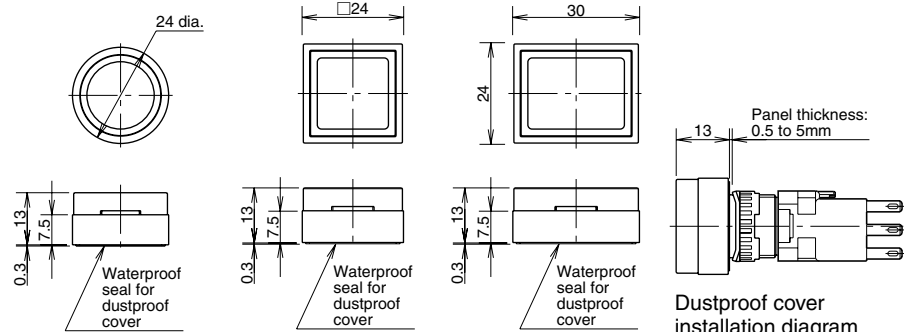
- The minimum installation pitch will be different if the dustproof cover is being used.
- Ambient usage temperature: -10 to +55°C
- Material: Elastomer (front/transparent) and polypropylene (back/non-transparent black)

### DIMENSIONS (unit: mm)

18 dia.  
(ACDL1812)

18 square  
(ACDL1813)

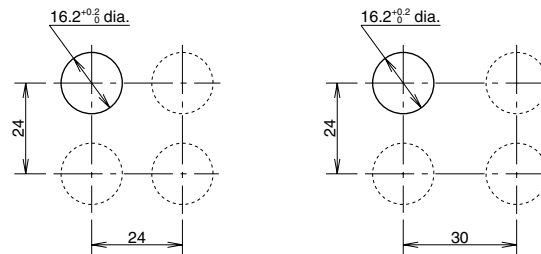
18 × 24  
(ACDL1814)



Dustproof cover installation diagram

(Minimum mounting pitch)

- 18 dia. and 18 square types
- 18 × 24 type



Note) When deciding the mounting pitch, make sure the cover has enough room to operate properly.

Type	For 18 dia.	For 18 square	For 18 × 24
Part No.	ACDL1812	ACDL1813	ACDL1814
Unit	10 pcs.		

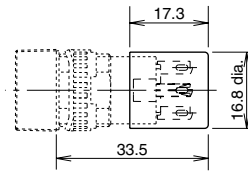


## Insulating terminal cover



Part No.	ACDA1850
Specifications	Opaque nylon
Unit	10 pcs.

### DIMENSIONS (unit: mm)



- This terminal cover is made of an opaque nylon material.

Note) When wiring the terminal, insert the lead into the hole in the insulating terminal cover before soldering it.

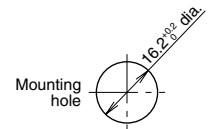
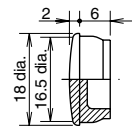
Dimension at inner back of panel when mounting insulating terminal cover: 47 mm

## Mounting hole plug (rubber)



Part No.	ACDL1820
Specifications	Nitrile rubber (black) Protective construction: IP65
Unit	10 pcs.

### DIMENSIONS (unit: mm)

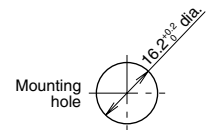
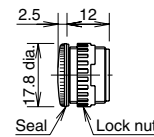


## Mounting hole plug (metal)



Part No.	ACDL1821
Specifications	Made of metal; protective construction: IP65
Unit	10 pcs.

### DIMENSIONS (unit: mm)



## Inscribed plate (maintenance part)



Shape	Round	Square	Rectangular
Part No.	ACDL1830	ACDL1831	ACDL1832
Unit	1 pack (5 plates)		

- Color: Opaque
- Material: Methacrylic resin

Maintenance parts should be installed by an engineer with specialized expertise in electrical components. When placing orders, please specify the number of marketing units.



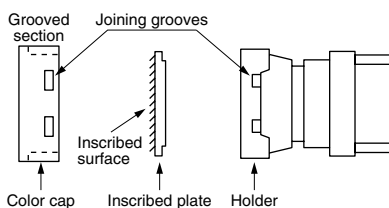
# Cautions For Use of the NS Series

## Cautions For Use

### 1. Mounting and removing the color cap and inscribed plate

#### 1) Removing

Grip the grooved part of the color cap with the removal tool (ACDL1804), and pull it towards you to remove the operating parts (the color cap, inscribed plate and lens holder). The inscribed plate can be removed by pushing the color cap outward from the back side, freeing the grooved section that joins it to the holder. The plate is inscribed on one surface, as shown below, and not on the other side.



#### 2) Mounting

Place the inscribed plate in the holder, line up the grooves in the color cap and the holder, and press them together. When doing this, make sure the inscribed plate is facing the correct direction. After the inscribed plate and color cap have been mounted in the holder, insert the assembled unit in the main unit, making sure it faces the correct direction.

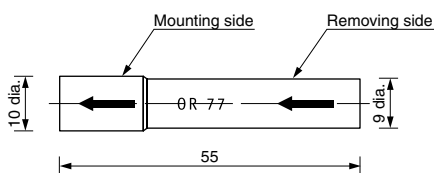
### 2. Mounting and removing LEDs

#### [Removing the LED]

Use a lamp replacement tool to remove the LED. Do not use pliers.

#### [Mounting the LED]

Install using a lamp replacement tool. Be sure that the orientation is correct when mounting.



### 3. Precautions when mounting the panel

Use a separately sold ring tightener when mounting to a panel. The use of needle-nose pliers or similar and the application of excessive tightening force can cause damage to the ring. The recommended ring tightening torque is 0.88 N·m.

### 4. Precautions when connecting wiring

Terminals should be soldered at 20 W for less than 5 seconds, or at 260°C for less than 3 seconds, without applying external force. When doing this work, make sure the soldering iron does not come in contact with the switch itself, and that, when connecting the wiring, no tensile force is applied to the terminal. Avoid bending the terminal or subjecting it to excessive force. Non-corroding liquid resin flux should be used.

### 5. Caution regarding LED service voltage

A service voltage of 5 V DC indicates a perfect direct current value.

### 6. Handling and Usage Precautions

#### 1) Aggregate tight mounting

Please be aware that heat caused by aggregate tight mounting of indicator lamps and illuminated pushbutton switches or continuously lit lamps can cause the ambient temperature to exceed the prescribed amount. Measures must be taken to ventilate or lower the operation voltage if the mounting panel is not metal or if the product is being used in a sealed control panel.

#### 2) Replacement of buttons (illuminating and non-illuminating)

Do not replace alternate type buttons (illuminating and non-illuminating) when they are locked. (Replacing while locked might damage the internal mechanism.) You must release the locks before replacing.

#### 3) Storage and place of use

- (1) Please use within the working ambient temperature and humidity ranges given on the ratings display.
- (2) When using in a location where oil, water and dirt are present, install a dust cover so that foreign substances cannot enter the sliding part of the pushbutton.

#### 4) Contact (microswitch)

When using identical NC (normal close) and NO (normal open) microswitch contacts, do not connect to the wrong voltage or to the wrong type of power supply. Doing so will cause a dead short.

#### 5) Oil resistance

The product has been evaluated with commonly used standard machining oil and cooling oil. Please inquire about other oils, since use of some special oils may not be possible.