

8 Series Toggle Switches

■ Introduction

The **8 Series Toggles** is Copal Electronics' high-reliability miniature switch product offering. This product line meets and exceeds all basic international switch standards.

With **8** toggle options, PC and solder lug terminals, power and logic level current ratings, 1-4 pole and many circuit offerings these switches can be used in many industries and various applications within these industries.

Four of the **8 Series** lines are washable. Specifically designed for PC applications with automated solder and cleaning methods.

The **8 Series** is available with **UL** Recognition and **CSA** Certification upon request from the customer.

■ Applications





































- Communication equipment
- Computer peripheral equipment
- Measuring instruments
- Medical equipment
- Automotive diagnosis

The switches can be used in a wide range of fields from industrial to consumer equipment.

■ Features of 8 Series Toggles

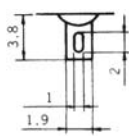
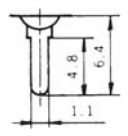
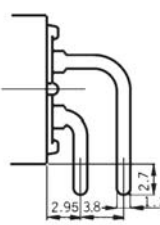
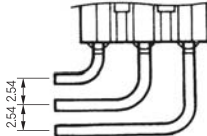
- 1. Terminal style :**
Solder, Straight, Right angle and vertical mount PC terminals.
- 2. Contacts :**
Silver or gold.
- 3. Epoxy resin case :**
UL94V-0 self-extinguishing epoxy.
- 4. Actuator styles :**
Over 30 actuator variations.
- 5. Insulation between terminal and ground :**
4 mm minimum.
- 6. Prevention of flux entry**
The epoxy resin seal on bottom of the switch helps prevent the entry of solder and flux.
- 7. Insulation barrier :**
Insulation barrier design between poles helps prevent short-circuiting between poles ensuring high reliability.
- 8. UL Recognized product File No.E43275**
- 9. CSA Certified product File No.LR38341**
- 10. For the UL Recognized and CSA Certified products please see page 412.**

8 Series Toggles Selection Table

| Part No. | Name | Actuator shape | Number of poles | Switching function | Terminals | Page | |
|-----------------|---------------------|---|-----------------|---|---|---|-----------------|
| 8A | Standard toggle |  | 1·2·3·4 | ON — ON ON — OFF — ON (ON) — OFF — (ON) ON — OFF — (ON) ON — — (ON) ※1/2 Poles ON — ON ON — OFF — ON ※3/4 Poles ON — ON — ON ON — ON — (ON) (ON) — ON — (ON) ※8A Type 2&4 Poles only |   Solder Lug Straight PC | 389 } 391 | |
| 8B | Mustang Toggle |  | 1·2·3·4 | |   Solder Lug Straight PC | 392 } 393 | |
| 8C | Flatted Toggle |  | 1·2·3·4 | |   Solder Lug Straight PC | 394 } 395 | |
| 8D | Long Toggle |  | 1·2·3·4 | |   Solder Lug Straight PC | 396 } 397 | |
| 8E | Lever Lock Toggle |  | 1·2·3·4 | |   Solder Lug Straight PC | 398 } 399 | |
| 8F | Splash Proof Toggle |  | 1·2·3·4 | |   Solder Lug Straight PC | 400 } 401 | |
| 8J | Short Toggle |  | 1·2·3·4 | |   Solder Lug Straight PC | 402 } 403 | |
| 8S | Color Tip Toggle |  | 1·2·3·4 | |   Solder Lug Straight PC | 404 } 405 | |
| Washable | 8G | Short Toggle Washable | 1·2 | | ON — ON ON — OFF — ON (ON) — OFF — (ON) ON — OFF — (ON) ON — — (ON) |    Straight PC Right Angle Vertical | 406 } 407 |
| | 8GA | Standard Toggle Washable | 1·2 | | |    Straight PC Right Angle Vertical | 408 |
| | 8GD | Long Toggle Washable | 1·2 |    Straight PC Right Angle Vertical | | 409 | |
| | 8GS | Color Tip Toggle Washable | 1·2 |    Straight PC Right Angle Vertical | | 410 | |

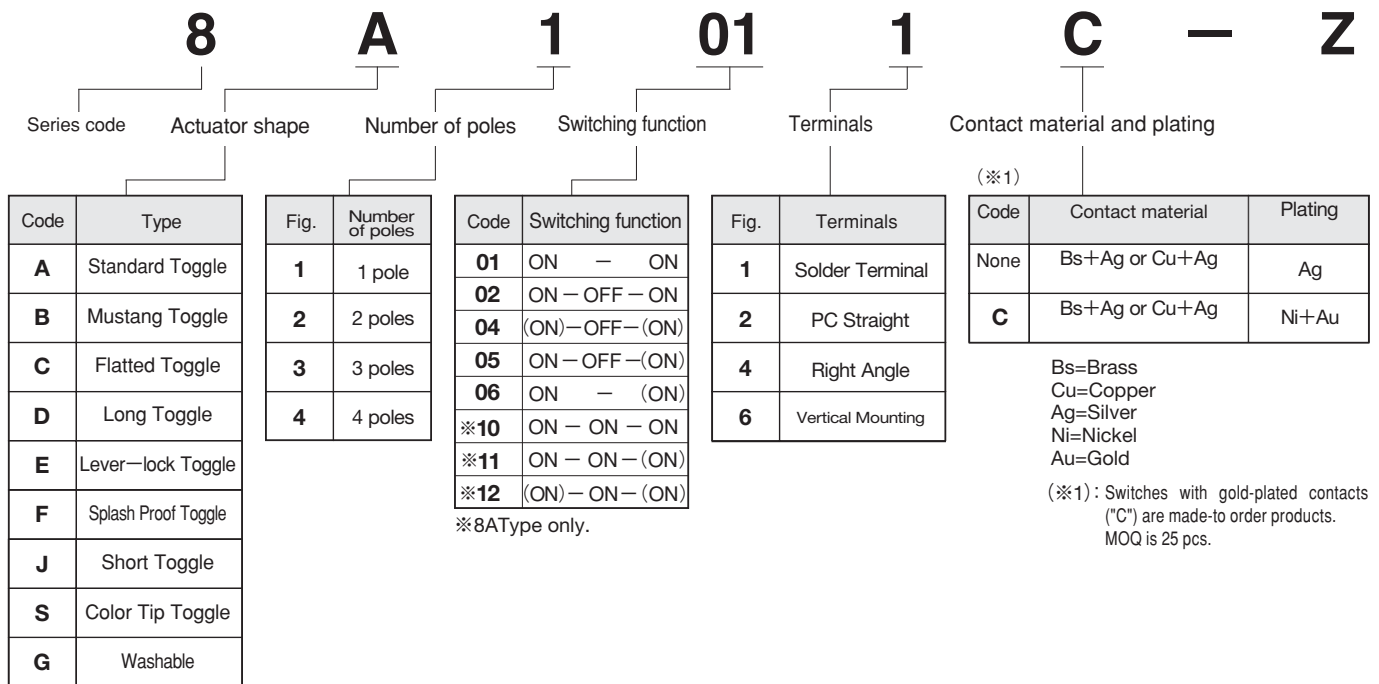
() indicates momentary actuation

■ Terminals

| Solder Terminal (Style:1) | PC Straight (Style:2) | Right Angle (Style:4) | Vertical Mount (Style:6) |
|--|--|--|--|
| t=0.8  | t=0.8 PC  | t=0.8 R/A  | t=0.8 w=1.2 V/M  |

8 Series Toggles

Part Numbering



Note : Some combinations may not be available. Please check the "Table of Part Numbers" for each series.

8 Series Toggles Common Specifications

| Contact specs. | | Silver | Gold |
|-------------------------------|----------------|------------------------------------|--------------------------------------|
| Rating | Max. | AC125V 6A AC250V 3A DC30V 4A | AC125V 6A AC250V 3A DC20V 25mA |
| Initial contact resistance | | 10mΩ Max. (DC2~4V 1A) | 20mΩ Max. (AC200μV 1.5mA) |
| Initial dielectric strength | | AC1500V 1 minute | |
| Initial insulation resistance | | 1000MΩMin. (DC500V) | |
| Electrical life | Alternate type | 50,000cycles | |
| | Momentary type | 25,000cycles | |
| Operating temperature range | | -30~+85°C | |
| Storage temperature range | | -40~+85°C | |

(ON) : Momentary.

8D

Long Bat Toggle Switch

RoHS Compliant



Features

The **8D** series has a longer actuator (21.3 mm) than the 8A series and is designed for equipment using double panels. The result is easy operation and a light feel. Suitable for applications where a long lever is required.

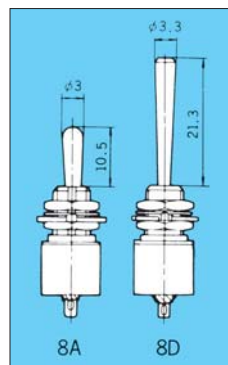


Table of Part Numbers

| Terminal Style | Number of poles | | | 1 pole | 2 poles | 3 poles | 4 poles |
|-----------------|--------------------|---------|------|---------------------------|---------------------------|------------|------------|
| | Switching Function | | | | | | |
| Solder Terminal | ON | — | ON | ☆ 8D1011-Z ▲ 8D1011C-Z | ★ 8D2011-Z ▲ 8D2011C-Z | ★ 8D3011-Z | ★ 8D4011-Z |
| | ON | — OFF — | ON | ★ 8D1021-Z ▲ 8D1021C-Z | ★ 8D2021-Z ▲ 8D2021C-Z | ★ 8D3021-Z | ★ 8D4021-Z |
| | (ON) | — OFF — | (ON) | ★ 8D1041-Z | ★ 8D2041-Z | — | — |
| | ON | — OFF — | (ON) | ★ 8D1051-Z | ★ 8D2051-Z | — | — |
| | ON | — | (ON) | ★ 8D1061-Z | ★ 8D2061-Z | — | — |
| PC Straight | ON | — | ON | ★ 8D1012-Z ▲ 8D1012C-Z | ★ 8D2012-Z ▲ 8D2012C-Z | ▲ 8D3012-Z | ▲ 8D4012-Z |
| | ON | — OFF — | ON | ▲ 8D1022-Z ▲ 8D1022C-Z | ★ 8D2022-Z ▲ 8D2022C-Z | ▲ 8D3022-Z | ▲ 8D4022-Z |
| | (ON) | — OFF — | (ON) | ▲ 8D1042-Z | ▲ 8D2042-Z | — | — |
| | ON | — OFF — | (ON) | ▲ 8D1052-Z | ▲ 8D2052-Z | — | — |
| | ON | — | (ON) | ★ 8D1062-Z | ▲ 8D2062-Z | — | — |

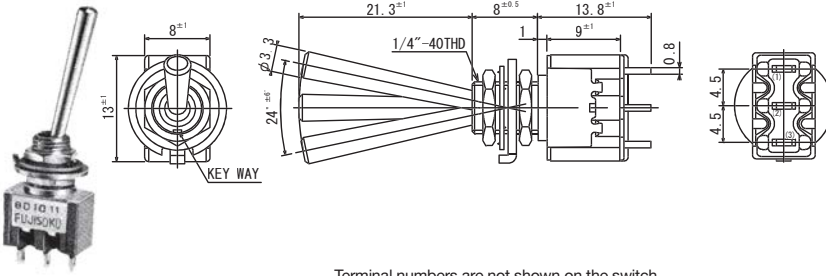
Standard Accessories

《Supplied with switch》

| Part Name | Hex Nut | Lockwasher | Locking Ring |
|------------|---------------|--------------|--------------|
| Part No. | 140008010241 | 140008030051 | 140008020062 |
| Dimensions | | | |
| Finish | Nickel plated | Zinc plated | Zinc plated |

- PC Hole Layouts Page 414.
- Panel Cut-Out Dimensions Page 414.
- Terminal Style Page 387.
- Soldering, Flux Cleaning and Packaging Spec. ... Page 413.

SPDT

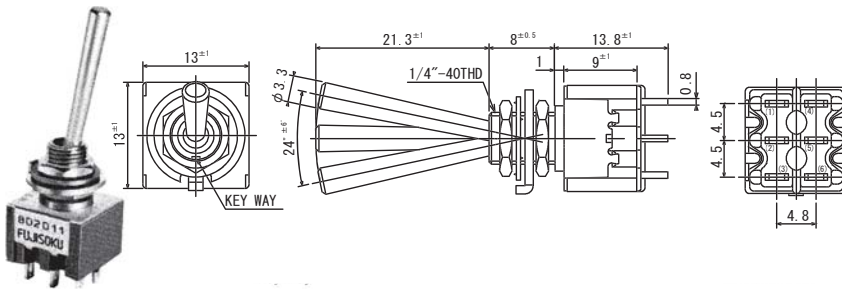


Terminal numbers are not shown on the switch.

| Switching function | Key way | Key way | Key way |
|----------------------|---------|---------|---------|
| Part No. | | | |
| 8D101■-Z | ON | — | ON |
| 8D102■-Z | ON | OFF | ON |
| 8D104■-Z | (ON) | OFF | (ON) |
| 8D105■-Z | ON | OFF | (ON) |
| 8D106■-Z | ON | — | (ON) |
| Connecting terminals | 2-3 | — | 2-1 |

■ : Please refer to "Table of Part Numbers" on P.396 for a list of full part numbers.

DPDT

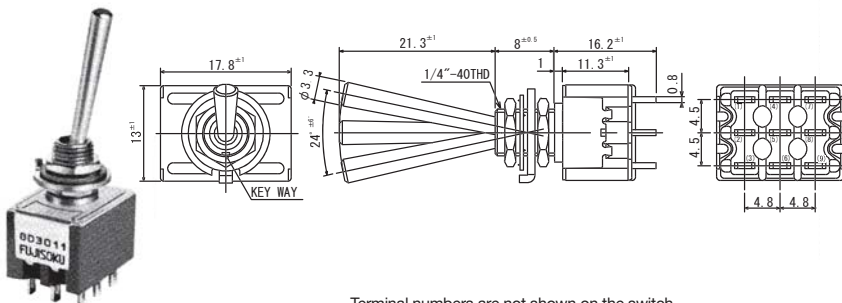


Terminal numbers are not shown on the switch.

| Switching function | Key way | Key way | Key way |
|----------------------|------------|---------|------------|
| Part No. | | | |
| 8D201■-Z | ON | — | ON |
| 8D202■-Z | ON | OFF | ON |
| 8D204■-Z | (ON) | OFF | (ON) |
| 8D205■-Z | ON | OFF | (ON) |
| 8D206■-Z | ON | — | (ON) |
| Connecting terminals | 2-3 5-6 | — | 2-1 5-4 |

■ : Please refer to "Table of Part Numbers" on P.396 for a list of full part numbers.

3PDT

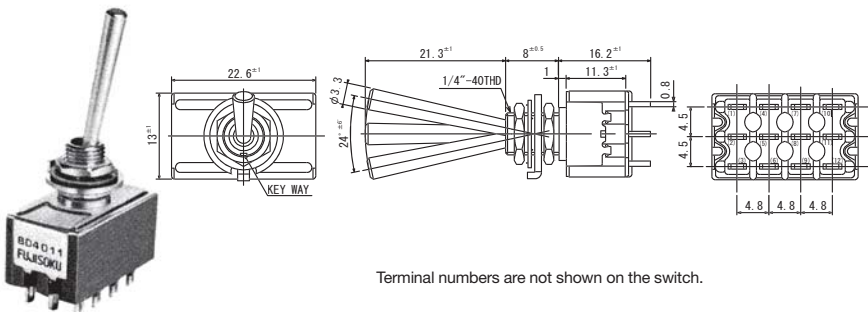


Terminal numbers are not shown on the switch.

| Switching function | Key way | Key way | Key way |
|----------------------|----------------|---------|----------------|
| Part No. | | | |
| 8D301■-Z | ON | — | ON |
| 8D302■-Z | ON | OFF | ON |
| Connecting terminals | 2-3 5-6 8-9 | — | 2-1 5-4 8-7 |

■ : Please refer to "Table of Part Numbers" on P.396 for a list of full part numbers.

4PDT



Terminal numbers are not shown on the switch.

| Switching function | Key way | Key way | Key way |
|----------------------|----------------------|---------|----------------------|
| Part No. | | | |
| 8D401■-Z | ON | — | ON |
| 8D402■-Z | ON | OFF | ON |
| Connecting terminals | 2-3 5-6 8-9 11-12 | — | 2-1 5-4 8-7 11-10 |

■ : Please refer to "Table of Part Numbers" on P.396 for a list of full part numbers.

■Precautions (8A • 8B • 8C • 8D • 8E • 8F • 8J • 8S • 8SS)

1. Soldering Specifications

(1) Manual soldering

Device : Solder iron

① 420°C Max. 3 sec. Max.

(2) Auto soldering

② 275°C Max. 6 sec. Max.

The above-stated soldering conditions shall apply only to switches with straight terminals. Auto soldering is not possible with right-angle terminals. Switches with right-angle terminals should be soldered manually according to the conditions specified in (1) above.

(3) When soldering two or more terminals to the common land, use the solder resist to isolate the terminals.

3. Mounting

- Do not bend the terminals before mounting the switch on the PC board.
- After mounting the switch, do not place the device in such a way that the device weight will be applied on to the actuator of the switch.
- For switches with straight terminals, solder the switch on the PC board after fixing the switch on the panel with a nut.

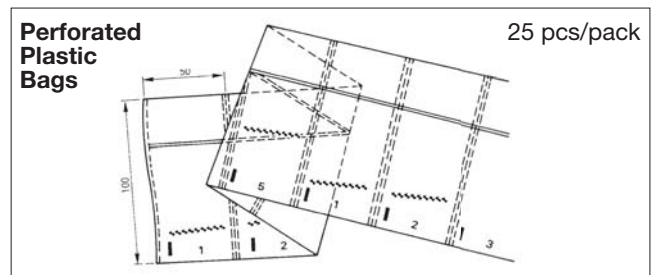
2. Flux Cleaning

(1) Solvent : Fluorine or Alcohol type.

(2) 8A/B/C/D/E/F/J/S series are not washable. To wash the PC board, clean the soldering surface of the PC board with a brush so that the switch is not exposed to the cleaning solution.

(3) Cleaning after soldering should be done after the terminal temperature falls to 90°C or below, or after leaving the switch for five minutes or longer at room temperature.

■Packaging Specification



(ON) : Momentary.

◆ 8 Series Toggles ◆

■ Panel Cut-Out Dimensions

| Series | 8A·8D·8J·8S | 8C | 8E | 8A·8D·8J·8S | 8C | 8E | 8F |
|-----------------|--|-------------|-------------|---|-------------|-------------|-----------|
| Panel thickness | 2.5 mm Max. | 2.4 mm Max. | 1.5 mm Max. | 3.5 mm Max. | 3.4 mm Max. | 2.5 mm Max. | 5 mm Max. |
| Dimensions | <p style="text-align: center;">With Locking Ring</p> | | | <p style="text-align: center;">Without Locking Ring</p> | | | |
| Series | 8B | | | | | | |
| Panel thickness | 5.9 mm Max. | | | 6.9 mm Max. | | | |
| Dimensions | <p style="text-align: center;">With Locking Ring</p> | | | <p style="text-align: center;">Without Locking Ring</p> | | | |

■ PC Hole Layouts

| Series | 8A · 8B · 8C · 8D · 8E · 8F · 8J · 8S |
|------------|--|
| Dimensions | <p style="text-align: center;">1-pole 2-pole</p> |

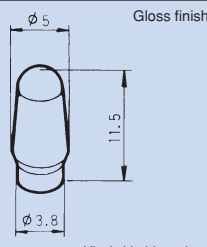
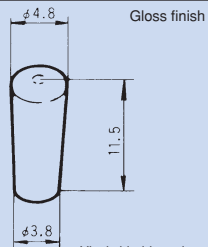
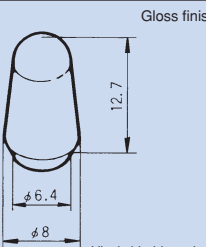
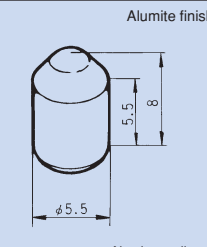
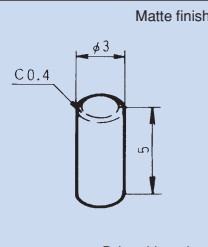
■ Standard Accessories

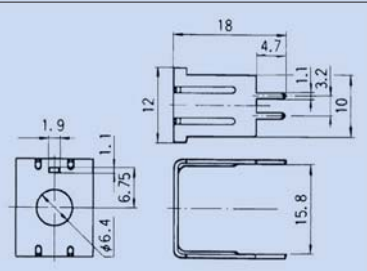
| Part Name | (Q'ty / switch) | | | | | | | |
|------------|-----------------|--------------|--------------|--------------|------------------------|---------------|--------------|--------------|
| | Dress Nut | Hex Nut | Lockwasher | Locking Ring | O-Ring | Hex Nut | Lockwasher | Locking Ring |
| Part No. | 140008010253 | 140008010241 | 140008030051 | 140008020062 | 14000610076 | 140008010243 | 140008030055 | 140008020065 |
| Dimensions | | | | | | | | |
| Finish | Nickel plated | | Zinc plated | | Nitrile rubber (Black) | Nickel plated | Zinc plated | |
| 8A | | 2 | 1 | 1 | | | | |
| 8B | | | | | | 2 | 1 | 1 |
| 8C | 1 | 1 | 1 | 1 | | | | |
| 8D | | 2 | 1 | 1 | | | | |
| 8E | | 2 | 1 | 1 | | | | |
| 8F | | 1 | 1 | | 1 | | | |
| 8J | | 2 | 1 | 1 | | | | |
| 8S | | 2 | 1 | 1 | | | | |

● Numbers in the above chart show the quantities of each accessories enclosed with the switch.

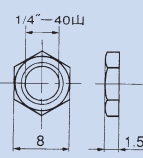
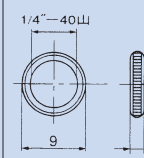
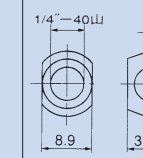
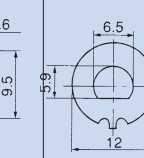
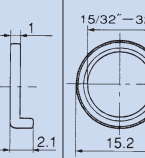
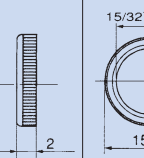
Optional Accessories

《Sold separately》

| Type | 8A · 8F · 8GA BT | 8A · 8F · 8GA BT | 8B | 8E | 8S · 8GS |
|------------|---|---|---|---|---|
| Part Name | Color Cap | | | | Color Tip |
| Dimensions |  |  |  |  |  |
| Silver | — | — | — | 140000470058 | — |
| White | 140000470030 | 140000470038 | 140000470063 | — | 140000470118 |
| Red | 140000470098 | 140000470100 | 140000470108 | 140000470060 | 140000470119 |
| Black | 140000470031 | 140000470039 | 140000470064 | 140000470059 | 140000470112 |
| Gray | 140000470037 | 140000470077 | 140000470102 | — | 140000470120 |

| | |
|------------|--|
| Type | 8A · 8C · 8D · 8J · 8S 1, 2 poles* |
| Part Name | Bracket |
| Part No. | 140000260715 |
| Dimensions |  |

※The Bracket cannot be used with switches with switching functions "10", "11", or "12" (ref. P.388). The size of the housings are different in switches with switching functions "10", "11", and "12" and the Bracket cannot be used.

| Type | 8A · 8C · 8D · 8E · 8J · 8N · 8S · 8R | | | 8F · 8P | 8B · 8Y | |
|------------|---|---|---|---|--|--|
| Part Name | Lock Nut | Round Nut | Pocketed Nut | Locking Ring | Round Nut | Round Nut |
| Part No. | 140008010276 | 140008010258 | 140008010274 | 140008020066 | 140008010272 | 140008010273 |
| Dimensions |  |  |  |  |  |  |
| Finish | Nickel | Chromium | Nickel | Zinc | Chromium | |

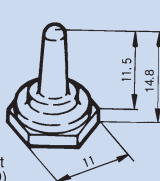
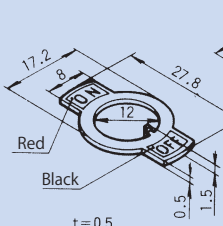
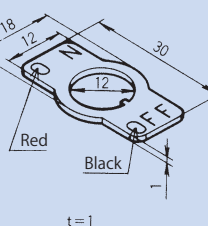
| Type | 8A | 8B | |
|------------|--|---|--|
| Part Name | Boot | Plate | Plate |
| Part No. | 140000470422 | 140008040021 | 140008040025 |
| Dimensions |  |  |  |

Table of 8 Series Toggles UL and CSA Listed

8 Series Toggles

| Poles | Switching Function | | | UL (※1.) | | | | | | | | CSA (※2.) | | | | | | | |
|---------|--------------------|------|----|----------|------|------|----|----|----|----|----|-----------|----|----|----|----|----|----|----|
| | | | | 8A | 8B | 8C | 8D | 8E | 8F | 8J | 8S | 8A | 8B | 8C | 8D | 8E | 8F | 8J | 8S |
| 1 pole | 101□ | ON | — | ON | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 102□ | ON | — | OFF | — | ON | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 104□ | (ON) | — | OFF | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 105□ | ON | — | OFF | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 106□ | ON | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 2 poles | 201□ | ON | — | ON | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 202□ | ON | — | OFF | — | ON | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 204□ | (ON) | — | OFF | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 205□ | ON | — | OFF | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 206□ | ON | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 210□ | ON | — | ON | — | ON | ○ | | | | | | | ○ | | | | | |
| | 211□ | ON | — | ON | — | (ON) | ○ | | | | | | | ○ | | | | | |
| 212□ | (ON) | — | ON | — | (ON) | ○ | | | | | | | ○ | | | | | | |
| 3 poles | 301□ | ON | — | ON | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 302□ | ON | — | OFF | — | ON | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 304□ | (ON) | — | OFF | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 305□ | ON | — | OFF | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 306□ | ON | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 4 poles | 401□ | ON | — | ON | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 402□ | ON | — | OFF | — | ON | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 404□ | (ON) | — | OFF | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 405□ | ON | — | OFF | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 406□ | ON | — | (ON) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 410□ | ON | — | ON | — | ON | ○ | | | | | | | ○ | | | | | |
| | 411□ | ON | — | ON | — | (ON) | ○ | | | | | | | ○ | | | | | |
| | 412□ | (ON) | — | ON | — | (ON) | ○ | | | | | | | ○ | | | | | |

(1) Terminal types: Solder terminal; Straight terminal

(2) **UL**-recognized switches: Solder terminals and straight terminals available for Single/Double/Three/Four Pole

(3) **CSA**-certified switches: Solder terminals and straight terminals available for Single Pole. Straight terminals available for Double/Three/Four Pole.

(4) UL, CSA marked switches available with additional charge.

(5) (※1.) **UL File No.E43275**
(※2.) **CSA File No.JR38341**

(6) As shown in the above chart, not all products are **UL**-recognized or **CSA**-certified. Please check with your local sales representative if you have any questions.