

# Miniature Snap Switch

## Single Pole

### D4 Series



#### Features

- Choice of standard or light operating force
- Long life coil spring mechanism
- RoHS compliant
- Cadmium free
- Various aux actuators
- Various terminal types
- Agency approved extended life versions available

#### Standard Parts<sup>1</sup> (note "G2" suffix does not affect fit, form or function)

|           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|
| D413-R1AA | D429-R1TD | D433-R1AA | D443-R1LD | D449-R1LL | D453-R1RA |
| D413-R1LA | D429-R1AA | D433-R1LD | D443-R1MD | D449-R1MD | D453-R1RD |
| D413-R1LD | D429-R1LD | D433-R1RA | D443-R1RA | D449-R1ML | D459-R1AA |
| D413-R1RA | D429-R1LL | D433-R1RD | D443-R1RD | D449-R1RA | D459-R1LD |
| D419-R1AA | D429-R1MD | D439-R1LL | D449-R1AA | D449-R1RD | D459-R1LL |
| D423-R1RA | D429-R1ML | D439-V1ML | D449-R1LD | D453-B8AA | D459-R1ML |
| D423-R1RD |           | D443-R1AA |           | D453-R1AA |           |

<sup>1</sup>The part number configuration matrix below provides details to the part numbers above.

For configurable part numbers that are not listed above, not listed in your region, or for custom part numbers, contact the factory or your distributor. For information on crossing discontinued U.S. only part numbers, see D4 cross-reference chart at [www.switches-sensors.zf.com](http://www.switches-sensors.zf.com).

#### Part Number Breakdown

D413-R1AA

| Series | Contact Rating <sup>2</sup> | Configuration <sup>3</sup> |   |           |                        |   |           |   |           |                 |  |
|--------|-----------------------------|----------------------------|---|-----------|------------------------|---|-----------|---|-----------|-----------------|--|
|        |                             | 85 °C                      |   |           | 125 °C                 |   |           |   | 150 °C    |                 |  |
| D4     | 1                           | 0.1 A                      | 1 | SPST – NO | Standard Op. Force "Y" | G | SPST – NO | S | SPST – NO | Light Op. Force |  |
|        | 2                           | 3 A                        | 2 | SPST – NC |                        | H | SPST – NC | T | SPST – NC |                 |  |
|        | 3                           | 5 A                        | 3 | SPDT      |                        | M | SPDT      | U | SPDT      |                 |  |
|        | 4                           | 10 A                       | 7 | SPST – NO | Light Op. Force "X"    | N | SPST – NO |   |           |                 |  |
|        | 5                           | 15 A                       | 8 | SPST – NC |                        | P | SPST – NC |   |           |                 |  |
|        | 8                           | 21 A                       | 9 | SPDT      |                        | R | SPDT      |   |           |                 |  |

<sup>2</sup>UL AC current rating; see table on reverse for complete details

<sup>3</sup>D48 only available with light operating force

#### Terminal Type mm (inches)

|    |                                              |    |                                           |
|----|----------------------------------------------|----|-------------------------------------------|
| A1 | Welding                                      | R1 | 4.8 x 0.5 (0.187 x 0.020) QC, straight*   |
| B8 | Short solder                                 | R3 | 4.8 x 0.5 (0.187 x 0.020) QC, dog leg**   |
| P4 | 1.2 x 0.5 (0.047 x 0.020) PCB, underside*    | S1 | Solder with temp stop                     |
| P5 | 1.2 x 0.5 (0.047 x 0.020) PCB, rear*         | V1 | 6.3 x 0.8 (0.250 x 0.032) QC, straight    |
| PA | 1.2 x 0.5 (0.047 x 0.020) PCB, housing side* | V3 | 6.3 x 0.8 (0.250 x 0.032) QC, dog leg     |
| PB | 1.2 x 0.5 (0.047 x 0.020) PCB, cover side*   | W9 | Screw*                                    |
| Q1 | 4.8 x 0.8 (0.187 x 0.032) QC, straight*      | X5 | 1.5 x 0.8 (0.059 x 0.032) QC, 2.5 mm grid |
| Q3 | 4.8 x 0.8 (0.187 x 0.032) QC, dog leg*       | Y5 | 6.3 x 0.8 (0.250 x 0.032) QC, 5 mm grid   |

\*not available for D48

\*\*not available for D45 or D48

#### Actuator Type mm (inches)

| Actuation length |                          |              | Actuation length |                                |              |
|------------------|--------------------------|--------------|------------------|--------------------------------|--------------|
| AA               | Button                   | N/A          | MA               | Lever, high ratio              | 25.7 (1.01)  |
| JA               | SS lever, standard ratio | 21.2 (0.835) | MD               | Lever, high ratio              | 40.1 (1.58)  |
| JD               | SS lever, standard ratio | 35.6 (1.4)   | ML               | Lever, high ratio              | 74.4 (2.93)  |
| JL               | SS lever, standard ratio | 69.9 (2.75)  | RA               | Roller, standard ratio         | 20.6 (0.811) |
| KA               | SS lever, high ratio     | 25.7 (1.01)  | RD               | Roller, standard ratio         | 34.1 (1.34)  |
| KD               | SS lever, high ratio     | 40.1 (1.58)  | SA               | Roller, simulated, rear mount  | 20.6 (0.811) |
| KL               | SS lever, high ratio     | 74.4 (2.93)  | TA               | Roller, high ratio             | 25.1 (0.988) |
| LA               | Lever, standard ratio    | 21.2 (0.835) | TD               | Roller, high ratio             | 38.6 (1.52)  |
| LD               | Lever, standard ratio    | 35.6 (1.4)   | UA               | Roller, simulated, front mount | 25.1 (0.988) |
| LL               | Lever, standard ratio    | 69.9 (2.75)  |                  |                                |              |

For actuator details, see D4 actuator reference sheet at <http://switches-sensors.zf.com/us/>

[www.switches-sensors.zf.com](http://www.switches-sensors.zf.com) ZF Electronics Systems Pleasant Prairie, LLC ("ZF") acquired the rights to the CHERRY branded switches and sensors in 2008. Although ZF divested its interest in the CHERRY name in 2015, the switches and sensors remain unchanged and are now sold under the ZF brand.

Page 1 of 2, Last update 2018-03-16, Specifications subject to change without notice.



## Electrical Specifications – Contact Ratings

| Contact | EN61058 <sup>4</sup>                                  | UL1054                                            |
|---------|-------------------------------------------------------|---------------------------------------------------|
| 1       | 0.1 (0.5) A, 250 VAC; 0.5 A, 30 VDC; 1 (1) A, 250 VAC | 0.1 A, 125/250 VAC; 0.5 A, 30 VDC; 1 A, 125 VAC   |
| 2       | 3 (1) A, 250 VAC                                      | 3 A, 125/250 VAC; 1/10 HP, 250 VAC                |
| 3       | 6 (2) A, 250 VAC                                      | 5 A, 125/250 VAC; ¼ HP, 250 VAC                   |
| 4       | 10 (3) A, 250 VAC                                     | 10 A, 125/250 VAC; 6 A, 30 VDC; ½ HP, 125/250 VAC |
| 5       | 16 (4) A, 250 VAC                                     | 15 A, 125/250 VAC; ½ HP, 125-250 VAC              |
| 8       | 21 (8) A, 250 VAC                                     | 21 A, 250 VAC; 1 HP, 125 VAC; 2 HP, 250 VAC       |

UL file number E314201

<sup>4</sup>D45 with R1 terminals are not 61508 certified

## Environmental and Mechanical Specifications

|                                                       |                                                            |                     |
|-------------------------------------------------------|------------------------------------------------------------|---------------------|
| Operating Temperature                                 | -40 °C to 85, 125 or 150 °C (-40 °F to 185, 257 or 302 °F) |                     |
| Flammability Rating                                   | UL 94V-0                                                   |                     |
| Operating life – electrical life at rated load, 85 °C |                                                            |                     |
| Contact                                               | EN61058                                                    | UL1054 <sup>5</sup> |
| 1                                                     | 50,000                                                     | 6,000               |
| 2                                                     | 50,000                                                     | 6,000               |
| 3                                                     | 50,000                                                     | 6,000               |
| 4                                                     | 50,000                                                     | 6,000               |
| 5                                                     | 50,000                                                     | 6,000               |
| 7                                                     | 10,000                                                     | 6,000               |

<sup>5</sup>Extended life available

## Material Specifications

|                    |                                                                               |
|--------------------|-------------------------------------------------------------------------------|
| Case               | Polyamide (PA) 85 °C, Thermoplastic Polyester (PET) 125 or 150 °C             |
| Cover              | Polyamide (PA) 85 °C, Thermoplastic Polyester (PET) 125 or 150 °C             |
| Actuating Button   | Thermoplastic Acetyl (POM) 85 °C, Thermoplastic Polyester (PET) 125 or 150 °C |
| Contacts           | Gold Cross Point (D41), Silver (D42), Silver Alloy (D43-D48)                  |
| Terminals          | Brass                                                                         |
| Auxiliary Actuator | Stainless Steel or Cold-Rolled Steel (Nickel Plated)                          |
| Moving Blade       | Silver Plated Brass                                                           |

## Environmental Specifications

|                     |                                                  |
|---------------------|--------------------------------------------------|
| Ambient Temperature | -40 °C to 85 °C/120 °C (-40 °F to 185 °F/248 °F) |
| Operating Force     | 45 – 400 cN (model dependent, without actuator)  |
| Total Travel        | 1.6 mm                                           |
| Ingress Protection  | IP40                                             |

## Dimensions mm (inches) and terminal configurations

