

## Enclosed Limit Switches

## ZE/ZV/ZV2

Large Switching Capacity and Long Service Life

- 15-amp, 125 VAC switching capacity
- Wide selection of actuators
- Rugged diecast housing
- Sealed (booted) switches meet NEMA types 1, 2, 3, 4 and 5
- Three mounting styles available:
  - Side mounting (ZE)
  - Diagonal side mounting (ZV2) is ideal for gang mounting several switches
  - Flanged base mounting (ZV)



## Ordering Information

### ■ SIDE-MOUNTING SWITCHES

| Actuators                | General-purpose | Sealed (booted) |
|--------------------------|-----------------|-----------------|
| Plunger                  | ZE-Q-2S         | ZE-N-2S         |
| Roller plunger           | ZE-Q22-2S       | ZE-N22-2S       |
| Cross roller plunger     | ZE-Q21-2S       | ZE-N21-2S       |
| Roller arm lever         | ZE-QA2-2S       | ZE-NA2-2S       |
| One-way action arm lever | ZE-QA277-2S     | ZE-NA277-2S     |
| Rod lever                | ZE-QCL-2S       | ZE-NCL-2S       |
| Coil spring              | —               | ZE-NJ-2S        |

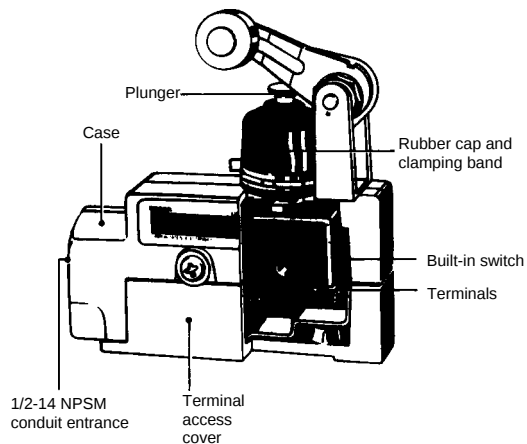
### ■ DIAGONAL SIDE-MOUNTING SWITCHES

| Actuators                | General-purpose | Sealed (booted) |
|--------------------------|-----------------|-----------------|
| Plunger                  | ZV2-Q-2S        | ZV2-N-2S        |
| Roller plunger           | ZV2-Q22-2S      | ZV2-N22-2S      |
| Cross roller plunger     | ZV2-Q21-2S      | ZV2-N21-2S      |
| Roller arm lever         | ZV2-QA2-2S      | ZV2-NA2-2S      |
| One-way action arm lever | ZV2-QA277-2S    | ZV2-NA277-2S    |
| Rod lever                | ZV2-QCL-2S      | ZV2-NCL-2S      |
| Coil spring              | —               | ZV2-NJ-2S       |

### ■ FLANGED BASE-MOUNTING SWITCHES

| Actuators                | General-purpose | Sealed (booted) |
|--------------------------|-----------------|-----------------|
| Plunger                  | ZV-Q-2S         | ZV-N-2S         |
| Roller plunger           | ZV-Q22-2S       | —               |
| Cross roller plunger     | ZV-Q21-2S       | —               |
| Roller arm lever         | ZV-QA2-2S       | ZV-NA2-2S       |
| One-way action arm lever | ZV-QA277-2S     | ZV-NA277-2S     |
| Rod lever                | ZV-QCL-2S       | ZV-NCL-2S       |
| Coil spring              | —               | ZV-NJ-2S        |

## Construction



## Specifications

### ■ RATINGS

#### Maximum Carrying Currents

| Rated voltage | Non-inductive load (amps) |      |           |      | Inductive load (amps) |      |            |      | Inrush current (amps) |         |
|---------------|---------------------------|------|-----------|------|-----------------------|------|------------|------|-----------------------|---------|
|               | Resistive load            |      | Lamp load |      | Inductive load        |      | Motor load |      | NC                    | NO      |
|               | NC                        | NO   | NC        | NO   | NC                    | NO   | NC         | NO   |                       |         |
| 125 VAC       | 15                        | 15   | 3         | 1.5  | 15                    | 15   | 5          | 2.5  | 30 max.               | 15 max. |
| 250 VAC       | 15                        | 15   | 2.5       | 1.25 | 15                    | 15   | 3          | 1.5  |                       |         |
| 480 VAC       | 10                        | 10   | 1.5       | 0.75 | 6                     | 6    | 1.5        | 0.75 |                       |         |
| 125 VDC       | 0.5                       | 0.5  | 0.5       | 0.5  | 0.05                  | 0.05 | 0.05       | 0.05 |                       |         |
| 250 VDC       | 0.25                      | 0.25 | 0.25      | 0.25 | 0.03                  | 0.03 | 0.03       | 0.03 |                       |         |

Note:

1. Inductive load has a power factor of 0.4 minimum (AC) and a time constant of 7 msec (DC).
2. Lamp load has an inrush current of 10 times the steady-state current, while motor load has an inrush current of 6 times the steady-state current.

### ■ CHARACTERISTICS

|                               |                        |                                                                                     |
|-------------------------------|------------------------|-------------------------------------------------------------------------------------|
| Enclosure rating              | UL                     | Types 3, 4, and 13                                                                  |
|                               | NEMA                   | Types 1, 2, 3, 4, 5 for "-N types"; Type 1 for "-Q" types; Type 13 for ZV2-Q models |
|                               | IEC 144                | IP65 for "-N types"; IP50 for "-Q types"                                            |
| Mechanical life               |                        | 10 million operations min.; 100,000 operations min. for ZE-NRN-S and ZV-NRN-S       |
| Ambient operating temperature |                        | -10° to 80°C (14° to 176°F)                                                         |
| Vibration                     | Malfunction durability | 10 to 55 Hz, 1.5 mm (0.06 in) double amplitude                                      |
| Shock                         | Malfunction durability | 20 G                                                                                |
|                               | Mechanical durability  | 100 G                                                                               |

## ■ OPERATING CHARACTERISTICS

**Legend:** OF = Operating Force (max.); RF = Reset Force (min.); OT = Overtravel (min.); PT = Pretravel;

MD = Movement Differential (max.); OP = Operating Position

### ZE-Q General Purpose and ZE-N Sealed, Side Mounting Switches

| Part number | Description                     | OF                                | RF                 | OT                   | PT                    | MD                    | OP                              |
|-------------|---------------------------------|-----------------------------------|--------------------|----------------------|-----------------------|-----------------------|---------------------------------|
| ZE-Q-2S     | Pin plunger                     | 250 to 350 g<br>(8.8 to 12.3 oz.) | 114 g<br>(4.0 oz.) | 5.5 mm<br>(0.217 in) | 0.4 mm<br>(0.016 in)  | 0.05 mm<br>(0.002 in) | 38.2 ±0.8 mm<br>(1.50 ±0.03 in) |
| ZE-Q22-2S   | Roller plunger                  | 250 to 350 g<br>(8.8 to 12.3 oz.) | 114 g<br>(4.0 oz.) | 3.6 mm<br>(0.142 in) | 0.5 mm<br>(0.020 in)  | 0.05 mm<br>(0.002 in) | 49.7 ±1 mm<br>(1.96 ±0.04 in)   |
| ZE-Q21-2S   | Cross roller plunger            | 250 to 350 g<br>(9.8 to 12.3 oz.) | 114 g<br>(4.0 oz.) | 3.6 mm<br>(0.142 in) | 0.5 mm<br>(0.020 in)  | 0.05 mm<br>(0.002 in) | 49.7 ±1 mm<br>(1.96 ±0.04 in)   |
| ZE-QA2-2S   | Roller arm lever                | 570 g<br>(20.1 oz.)               | 170 g<br>(6.0 oz.) | 6 mm<br>(0.236 in)   | 4 mm<br>(0.157 in)    | 0.4 mm<br>(0.016 in)  | —                               |
| ZE-QA277-2S | One-way action arm lever        | 570 g<br>(20.1 oz.)               | 170 g<br>(6.0 oz.) | 6 mm<br>(0.236 in)   | 4 mm<br>(0.157 in)    | 0.4 mm<br>(0.016 in)  | —                               |
| ZE-QCL-2S   | Rod lever                       | 153 g<br>(5.4 oz.)                | 45 g<br>(1.6 oz.)  | 22 mm<br>(0.866 in)  | 15 mm<br>(0.591 in)   | 1.5 mm<br>(0.059 in)  | —                               |
| ZE-N-2S     | Sealed pin plunger              | 800 g<br>(28.2 oz.)               | 240 g<br>(8.5 oz.) | 5 mm<br>(0.197 in)   | 2 mm<br>(0.079 in)    | 0.1 mm<br>(0.004 in)  | 45.8 ±0.8 mm<br>(1.80 ±0.03 in) |
| ZE-N22-2S   | Sealed roller plunger           | 500 g<br>(17.6 oz.)               | 100 g<br>(3.5 oz.) | 3.5 mm<br>(0.138 in) | 1 mm<br>(0.039 in)    | 0.12 mm<br>(0.005 in) | 49.7 ±0.8 mm<br>(1.96 ±0.03 in) |
| ZE-N21-2S   | Sealed cross roller plunger     | 500 g<br>(17.6 oz.)               | 100 g<br>(3.5 oz.) | 3.5 mm<br>(0.138 in) | 1 mm<br>(0.039 in)    | 0.12 mm<br>(0.005 in) | 49.7 ±0.8 mm<br>(1.96 ±0.03 in) |
| ZE-NA2-2S   | Sealed roller arm lever         | 640 g<br>(22.6 oz.)               | 230 g<br>(8.1 oz.) | 6 mm<br>(0.236 in)   | 5 mm<br>(0.197 in)    | 0.4 mm<br>(0.016 in)  | —                               |
| ZE-NA277-2S | Sealed one-way action arm lever | 640 g<br>(22.6 oz.)               | 230 g<br>(8.1 oz.) | 6 mm<br>(0.236 in)   | 5 mm<br>(0.197 in)    | 0.4 mm<br>(0.016 in)  | —                               |
| ZE-NCL-2S   | Sealed rod lever                | 170 g<br>(6.0 oz.)                | 60 g<br>(2.1 oz.)  | 22 mm<br>(0.866 in)  | 18.5 mm<br>(0.728 in) | 1.5 mm<br>(0.059 in)  | —                               |
| ZE-NJ-2S    | Sealed coil spring              | 150 g<br>(5.3 oz.)                | —                  | —                    | 15°                   | —                     | —                               |

### ZV2-Q General Purpose and ZV2-N Sealed, Diagonal Side Mounting Switches

| Part number  | Description                     | OF                                | RF                 | OT                   | PT                    | MD                    | OP                              |
|--------------|---------------------------------|-----------------------------------|--------------------|----------------------|-----------------------|-----------------------|---------------------------------|
| ZV2-Q-2S     | Pin plunger                     | 250 to 350 g<br>(8.8 to 12.3 oz.) | 114 g<br>(4.0 oz.) | 5.5 mm<br>(0.217 in) | 0.4 mm<br>(0.016 in)  | 0.05 mm<br>(0.002 in) | 63.7 ±0.8 mm<br>(2.51 ±0.03 in) |
| ZV2-Q22-2S   | Roller plunger                  | 250 to 350 g<br>(8.8 to 12.3 oz.) | 114 g<br>(4.0 oz.) | 3.6 mm<br>(0.142 in) | 0.5 mm<br>(0.020 in)  | 0.05 mm<br>(0.002 in) | 75.2 ±0.8 mm<br>(2.96 ±0.03 in) |
| ZV2-Q21-2S   | Cross roller plunger            | 250 to 350 g<br>(9.8 to 12.3 oz.) | 114 g<br>(4.0 oz.) | 3.6 mm<br>(0.142 in) | 0.5 mm<br>(0.020 in)  | 0.05 mm<br>(0.002 in) | 75.2 ±0.8 mm<br>(2.96 ±0.03 in) |
| ZV2-QA2-2S   | Roller arm lever                | 570 g<br>(20.1 oz.)               | 170 g<br>(6.0 oz.) | 6 mm<br>(0.236 in)   | 4 mm<br>(0.157 in)    | 0.4 mm<br>(0.016 in)  | —                               |
| ZV2-QA277-2S | One-way action arm lever        | 570 g<br>(20.1 oz.)               | 170 g<br>(6.0 oz.) | 6 mm<br>(0.236 in)   | 4 mm<br>(0.157 in)    | 0.4 mm<br>(0.016 in)  | —                               |
| ZV2-QCL-2S   | Rod lever                       | 153 g<br>(5.4 oz.)                | 45 g<br>(1.6 oz.)  | 22 mm<br>(0.866 in)  | 15 mm<br>(0.591 in)   | 1.5 mm<br>(0.059 in)  | —                               |
| ZV2-N-2S     | Sealed pin plunger              | 800 g<br>(28.2 oz.)               | 240 g<br>(8.5 oz.) | 5 mm<br>(0.197 in)   | 2 mm<br>(0.079 in)    | 0.1 mm<br>(0.004 in)  | 71.4 ±0.8 mm<br>(2.81 ±0.03 in) |
| ZV2-N22-2S   | Sealed roller plunger           | 500 g<br>(17.6 oz.)               | 100 g<br>(3.5 oz.) | 3.5 mm<br>(0.138 in) | 1 mm<br>(0.039 in)    | 0.12 mm<br>(0.005 in) | 35.7 ±0.8 mm<br>(1.41 ±0.03 in) |
| ZV2-N21-2S   | Sealed cross roller plunger     | 500 g<br>(17.6 oz.)               | 100 g<br>(3.5 oz.) | 3.5 mm<br>(0.138 in) | 1 mm<br>(0.039 in)    | 0.12 mm<br>(0.005 in) | 35.7 ±0.8 mm<br>(1.41 ±0.03 in) |
| ZV2-NA2-2S   | Sealed roller arm lever         | 640 g<br>(22.6 oz.)               | 230 g<br>(8.1 oz.) | 6 mm<br>(0.236 in)   | 5 mm<br>(0.197 in)    | 0.4 mm<br>(0.016 in)  | —                               |
| ZV2-NA277-2S | Sealed one-way action arm lever | 640 g<br>(22.6 oz.)               | 230 g<br>(8.1 oz.) | 6 mm<br>(0.236 in)   | 5 mm<br>(0.197 in)    | 0.4 mm<br>(0.016 in)  | —                               |
| ZV2-NCL-2S   | Sealed rod lever                | 170 g<br>(6.0 oz.)                | 60 g<br>(2.1 oz.)  | 22 mm<br>(0.866 in)  | 18.5 mm<br>(0.728 in) | 1.5 mm<br>(0.059 in)  | —                               |
| ZV2-NJ-2S    | Sealed coil spring              | 150 g<br>(5.3 oz.)                | —                  | —                    | 15°                   | —                     | —                               |