

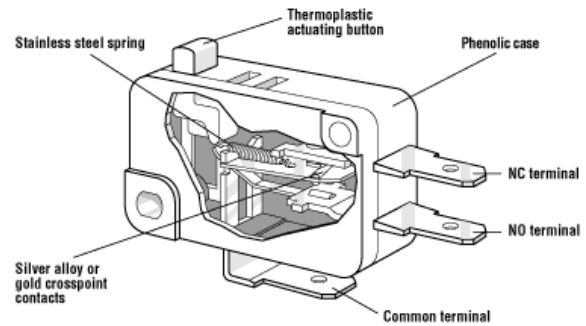
# MINIATURE Switch

# E21-E36 Series

Not recommended for new designs

Please review our D4 series

<http://switches-sensors.zf.com/us/product/miniature-d4/>



## Features

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• 8 Contact Ratings DC ratings optional</li> <li>• High temperature versions optional</li> </ul> | <ul style="list-style-type: none"> <li>• Standard or light force versions available</li> <li>• Agency approved long life versions optional</li> </ul> |
|---|---|

## Electrical Ratings and Operating Life

| Switch Series | According to UL 1054                                    |                               |
|---------------|---|-------------------------------|
|               | Nominal Load  | Electrical Life at Rated Load |
| E21           | 0.1A 125 VAC (0.25A, 30VDC optional)                    | 6000**                        |
| E22           | 3A 125/250 VAC, 1/10 HP 250 VAC (0.1A, 125VDC optional) | 6000                          |
| E23           | 5A ¼ HP, 125/250 VAC                                    | 6000                          |
| E31           | 1A 125 VAC  | 6000                          |
| E33           | 10A ½ HP 125/250 VAC (6A 30VDC optional)                | 6000**                        |
| E34           | 15A ½ HP 125/250 VAC                                    | 6000*                         |
| E35           | 20.1A ½ HP 125/250 VAC                                  | 6000                          |
| E36           | 25A 125/250 VAC; 1 HP 125 VAC, 2 HP 250 VAC             | 6000                          |

\* Indicates 100K UL Life available on AC versions optional. \*\* Indicates 100K UL Life available on AC and DC versions optional Contact Factory for new part number.

## Technical Specifications

**Temperature Rating:** -40°C to 85°C (130°C and 150°C optional. Not available on E36. Contact factory for special part numbers.)

**Flammability Rating:** UL94HB

**Mounting:** Recommended screw: #4-40 round head, UL approved. Recommended torque: 3 inch lbs. max

**UL File No.:** E23301

**RoHS:** Compliant

Specifications subject to change

## Material Specifications

**Case:** General Purpose Phenolic

**Common Terminal:** Silver Plated Brass (E21, E22, E23, E31, E33, E34, E35) Silver Plated Copper (E36)

**NO & NC Terminal:** Brass (E21, E22, E23, E31, E33, E34, E35) Copper (E36)

**Moving Blade:** Brass (E21, E33, E23) Silver Plated Beryllium Copper (E31, E33, E34, E35, E36)

**Actuating Button:** Thermoplastic Acetal

**Auxiliary Actuator:** Cold Rolled Steel (Nickel Plated) (E21 and E22 use Aluminum)

**Contacts:** Silver Alloy  
Gold Crosspoint: E21 and E31  
Fine Silver: E22

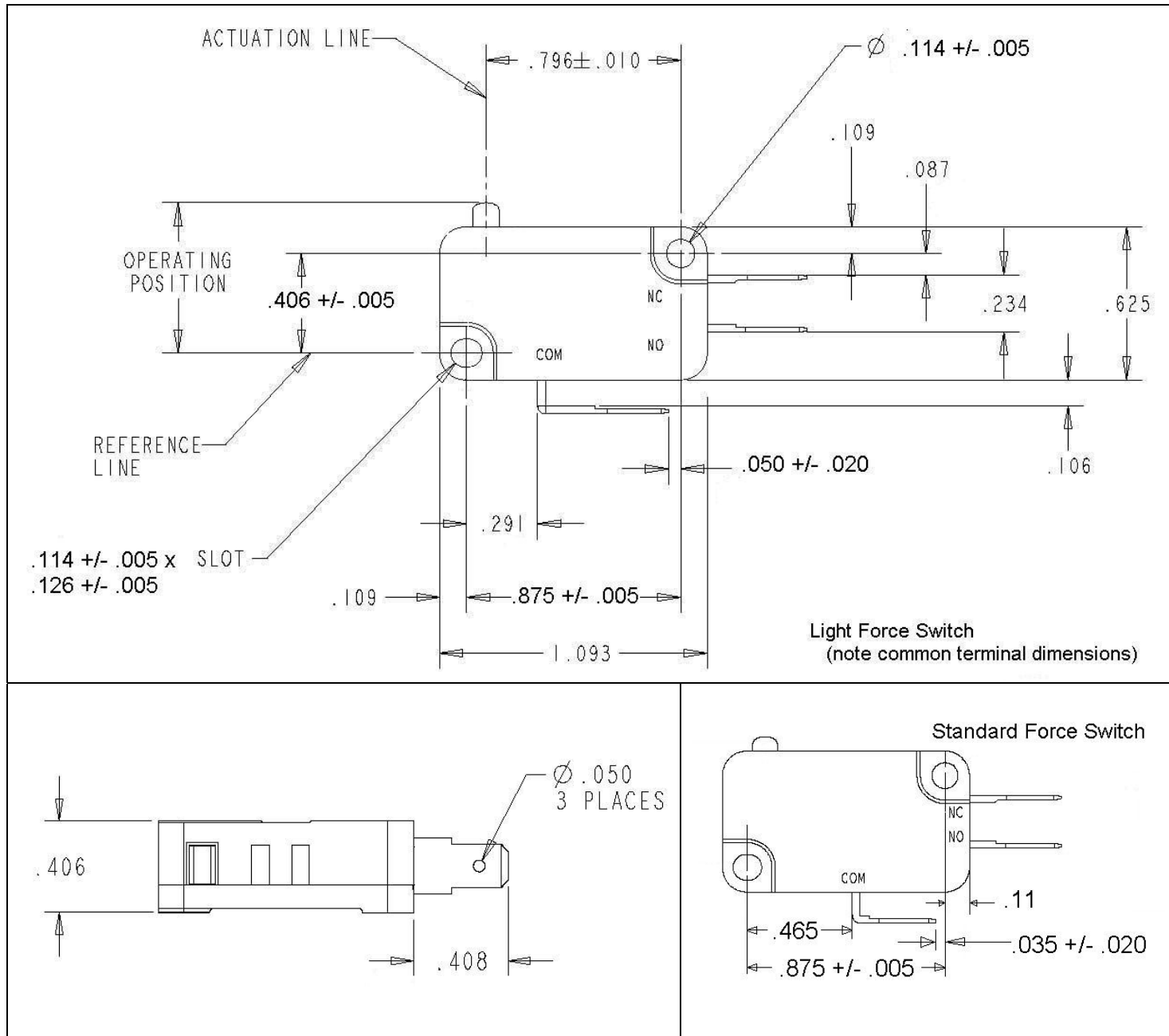


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# E21-E36 Series

Dimensions inches



Light Force Switch  
(note common terminal dimensions)

Standard Force Switch

Common terminal dimensions valid for 0.187" QC terminals only

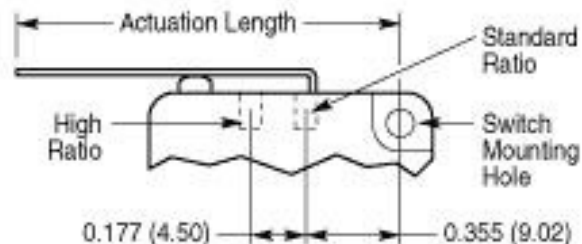


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# E21-E36 Series

## Actuators

Standard type integral hinged lever and roller actuators are available in choice of 2 mounting positions. Actuation lengths are dimensioned from the centerline of the switch mounting hole as shown.



| Plastic Actuator for -90N and -90NX switches   | Plastic Actuator for -50N and -50NX switches   |
|--|--|
| <p>Diagram illustrating the dimensions and labels for a plastic actuator for -90N and -90NX switches. The actuation length is 1.332 +/- .031. The operating position is .735 to .851. The actuation line is shown, along with a radius of R .09.</p> | <p>Diagram illustrating the dimensions and labels for a plastic actuator for -50N and -50NX switches. The actuation length is 1.382. The operating position is .555 to .645. The actuation line is shown, along with a reference line. The switch terminals are labeled COM, NC, and NO.</p> |
| Roller Actuator  | Straight Leaf Actuator   |
| <p>Diagram illustrating the dimensions and labels for a roller actuator. The dimensions are 0.182" (Ref) and 0.187" (Ref).</p>   | <p>Diagram illustrating the dimensions and labels for a straight leaf actuator. The dimensions are .180 and .025.</p>  |

Note: Plastic levers only available on 85°C rated switches



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## Actuator Specifications

| Item Number | Actuator | UL Rating  | Maximum Operating Force (grams) | Maximum Pretravel inches (mm) | Operating Point* inches (mm)        | Minimum Overtravel inches (mm) | Max. Movement Differential inches (mm) | Actuation Length** |
|-------------|----------|--|---------------------------------|-------------------------------|-------------------------------------|--------------------------------|--|--------------------|
| 0E2100AX    |          | 0.1A, 125VAC<br>(0.25A, 30VDC optional)                  | 15                              | 0.047 (1.19)                  | 0.578 +/- 0.020<br>(14.68 +/- 0.51) | .050<br>(1.27)                 | 0.010<br>(0.25)                        | N/A                |
| 0E2100K0    |          | 0.1A, 125VAC<br>(0.25A, 30VDC optional)                  | 75                              | 0.047 (1.19)                  | 0.806 +/- 0.030<br>(20.47 +/- 0.76) | 0.040<br>(1.02)                | 0.010<br>(0.25)                        | 0.810<br>(20.57)   |
| 0E2150H0    |          | 0.1A, 125VAC<br>(0.25A, 30VDC optional)                  | 35                              | 0.125 (3.18)                  | 0.600 +/- 0.045<br>(15.24 +/- 0.51) | 0.085<br>(2.16)                | 0.030<br>(0.76)                        | 1.40<br>(35.56)    |
| 0E2200AX    |          | 3A, 125/250VAC 1/10HP, 250VAC<br>(0.1A, 125VDC optional) | 15                              | 0.047 (1.19)                  | 0.578 +/- 0.020<br>(14.68 +/- 0.51) | .050<br>(1.27)                 | 0.010<br>(0.25)                        | N/A                |
| 0E2200K0    |          | 3A, 125/250VAC 1/10HP, 250VAC<br>(0.1A, 125VDC optional) | 75                              | 0.047 (1.19)                  | 0.806 +/- 0.030<br>(20.47 +/- 0.76) | 0.040<br>(1.02)                | 0.010<br>(0.25)                        | 0.810<br>(20.57)   |
| 0E2250HX    |          | 3A, 125/250VAC 1/10HP, 250VAC<br>(0.1A, 125VDC optional) | 8                               | 0.125 (3.18)                  | 0.600 +/- 0.045<br>(15.24 +/- 0.51) | 0.085<br>(2.16)                | 0.030<br>(0.76)                        | 1.40<br>(35.56)    |
| 0E2250K0    |          | 3A, 125/250VAC 1/10HP, 250VAC<br>(0.1A, 125VDC optional) | 35                              | 0.125 (3.18)                  | 0.806 +/- 0.045<br>(20.47 +/- 1.14) | 0.085<br>(2.16)                | 0.030<br>(0.76)                        | 1.34<br>(34.04)    |
| 0E2250KL    |          | 3A, 125/250VAC 1/10HP, 250VAC<br>(0.1A, 125VDC optional) | 25                              | 0.200 (5.08)                  | 0.806 +/- 0.075<br>(20.47 +/- 1.91) | 0.120<br>(3.05)                | 0.040<br>(1.02)                        | 1.516<br>(38.51)   |
| 0E2255HX    |          | 3A, 125/250VAC 1/10HP, 250VAC<br>(0.1A, 125VDC optional) | 4                               | 0.300 (7.62)                  | 0.600 +/- 0.100<br>(15.24 +/- 2.54) | 0.187<br>(4.75)                | 0.065<br>(1.65)                        | 2.757<br>(70.03)   |
| 0E2285HX    |          | 3A, 125/250VAC 1/10HP, 250VAC<br>(0.1A, 125VDC optional) | 2                               | 0.500 (12.70)                 | 0.600 +/- 0.175<br>(15.24 +/- 4.45) | 0.312<br>(7.92)                | 0.100<br>(2.54)                        | 2.932<br>(74.47)   |
| 0E2300A0    |          | 5A, 1/4HP, 125/250VAC                                    | 170                             | 0.047 (1.19)                  | 0.578 +/- 0.020<br>(14.68 +/- 0.51) | .050<br>(1.27)                 | 0.010<br>(0.25)                        | N/A                |
| 0E2300K0    |          | 5A, 1/4HP, 125/250VAC                                    | 170                             | 0.047 (1.19)                  | 0.806 +/- 0.030<br>(20.47 +/- 0.76) | 0.040<br>(1.02)                | 0.010<br>(0.25)                        | 0.810<br>(20.57)   |
| 0E2350H0    |          | 5A, 1/4HP, 125/250VAC                                    | 85                              | 0.125 (3.18)                  | 0.600 +/- 0.045<br>(15.24 +/- 0.51) | 0.085<br>(2.16)                | 0.030<br>(0.76)                        | 1.40<br>(35.56)    |
| 0E2350K0    |          | 5A, 1/4HP, 125/250VAC                                    | 86                              | 0.125 (3.18)                  | 0.806 +/- 0.045<br>(20.47 +/- 1.14) | 0.085<br>(2.16)                | 0.030<br>(0.76)                        | 1.34<br>(34.04)    |
| 0E2355HX    |          | 5A, 1/4HP, 125/250VAC                                    | 10                              | 0.300 (7.62)                  | 0.600 +/- 0.100<br>(15.24 +/- 2.54) | 0.187<br>(4.75)                | 0.065<br>(1.65)                        | 2.757<br>(70.03)   |
| 0E2385HX    |          | 5A, 1/4HP, 125/250VAC                                    | 6                               | 0.500 (12.70)                 | 0.600 +/- 0.175<br>(15.24 +/- 4.45) | 0.312<br>(7.92)                | 0.100<br>(2.54)                        | 2.932<br>(74.47)   |
| 0E3300A0    |          | 10A, 1/2HP, 125/250VAC<br>(6A, 30VDC optional)           | 285                             | 0.047 (1.19)                  | 0.578 +/- 0.020<br>(14.68 +/- 0.51) | .050<br>(1.27)                 | 0.010<br>(0.25)                        | N/A                |
| 0E3300AX    |          | 10A, 1/2HP, 125/250VAC<br>(6A, 30VDC optional)           | 75                              | 0.047 (1.19)                  | 0.578 +/- 0.020<br>(14.68 +/- 0.51) | .050<br>(1.27)                 | 0.010<br>(0.25)                        | N/A                |
| 0E3300K0    |          | 10A, 1/2HP, 125/250VAC<br>(6A, 30VDC optional)           | 285                             | 0.047 (1.19)                  | 0.806 +/- 0.030<br>(20.47 +/- 0.76) | 0.040<br>(1.02)                | 0.010<br>(0.25)                        | 0.810<br>(20.57)   |
| 0E3350H0    |          | 10A, 1/2HP, 125/250VAC<br>(6A, 30VDC optional)           | 144                             | 0.125 (3.18)                  | 0.600 +/- 0.045<br>(15.24 +/- 0.51) | 0.085<br>(2.16)                | 0.030<br>(0.76)                        | 1.40<br>(35.56)    |
| 0E3350HL    |          | 10A, 1/2HP, 125/250VAC<br>(6A, 30VDC optional)           | 86                              | 0.220 (5.59)                  | 0.600 +/- 0.075<br>(15.24 +/- 1.91) | 0.130<br>(3.30)                | 0.040<br>(1.02)                        | 1.580<br>(40.13)   |
| 0E3350K0    |          | 10A, 1/2HP, 125/250VAC<br>(6A, 30VDC optional)           | 144                             | 0.125 (3.18)                  | 0.806 +/- 0.045<br>(20.47 +/- 1.14) | 0.085<br>(2.16)                | 0.030<br>(0.76)                        | 1.34<br>(34.04)    |
| 0E3385HX    |          | 10A, 1/2HP, 125/250VAC<br>(6A, 30VDC optional)           | 10                              | 0.500 (12.70)                 | 0.600 +/- 0.175<br>(15.24 +/- 4.45) | 0.312<br>(7.92)                | 0.100<br>(2.54)                        | 2.932<br>(74.47)   |
| 0E3400A0    |          | 15A, 1/2HP, 125/250VAC                                   | 400                             | 0.047 (1.19)                  | 0.578 +/- 0.020<br>(14.68 +/- 0.51) | .050<br>(1.27)                 | 0.010<br>(0.25)                        | N/A                |
| 0E3400K0    |          | 15A, 1/2HP, 125/250VAC                                   | 400                             | 0.047 (1.19)                  | 0.806 +/- 0.030<br>(20.47 +/- 0.76) | 0.040<br>(1.02)                | 0.010<br>(0.25)                        | 0.810<br>(20.57)   |
| 0E3450HX    |          | 15A, 1/2HP, 125/250VAC                                   | 50                              | 0.125 (3.18)                  | 0.600 +/- 0.045<br>(15.24 +/- 0.51) | 0.085<br>(2.16)                | 0.030<br>(0.76)                        | 1.40<br>(35.56)    |
| 0E3450K0    |          | 15A, 1/2HP, 125/250VAC                                   | 200                             | 0.125 (3.18)                  | 0.806 +/- 0.045<br>(20.47 +/- 1.14) | 0.085<br>(2.16)                | 0.030<br>(0.76)                        | 1.34<br>(34.04)    |
| 0E3455HX    |          | 15A, 1/2HP, 125/250VAC                                   | 22                              | 0.300 (7.62)                  | 0.600 +/- 0.100<br>(15.24 +/- 2.54) | 0.187<br>(4.75)                | 0.065<br>(1.65)                        | 2.757<br>(70.03)   |
| 0E3485HX    |          | 15A, 1/2HP, 125/250VAC                                   | 13                              | 0.500 (12.70)                 | 0.600 +/- 0.175<br>(15.24 +/- 4.45) | 0.312<br>(7.92)                | 0.100<br>(2.54)                        | 2.932<br>(74.47)   |

\* Measured above reference line. Refer to dimensional drawing.

\*\* Actuator tolerance +/- 0.031" @ 0.787).

NOTE: E35 and E36 available in light force only.



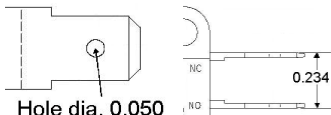
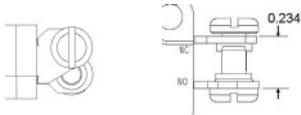

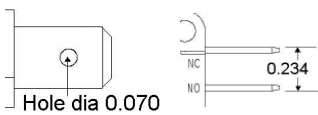
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# E21-E36 Series

## Terminals

|  |   |  |  |
|--|---|--|--|
|  <p>Hole dia. 0.050</p> <p>0.187 x 0.020 QC Terminals<br/>Suffix -00</p> |  <p>Screw Terminals (special order)<br/>Suffix -10</p> |  <p>Hole dia. 0.099</p> <p>Solder Terminals (special order)<br/>Suffix -20</p> |  <p>Hole dia 0.070</p> <p>0.250 x 0.032 QC Terminals<br/>Suffix -40</p> |
|--|---|--|--|

**Note:** 0.187" Quick Connect terminals are standard i.e. part number E21-00A  
To order 0.250" Quick Connect terminals 'add' the suffix to the part number, i.e. E21-40A

## Circuitry

| Terminal  | Standard Force |         |         | Light Force |         |         |
|-----------|----------------|---------|---------|-------------|---------|---------|
|           | SPDT           | SPST NO | SPST NC | SPDT        | SPST NO | SPST NC |
| QC 0.187" | -00A           | -01A    | -02A    | -00AX       | -01AX   | -02AX   |
| Screw     | -10A           | -11A    | -12A    | -10AX       | -11AX   | -12AX   |
| Solder    | -20A           | -21A    | -22A    | -20AX       | -21AX   | -22AX   |
| QC 0.250" | -40A           | -41A    | -42A    | -40AX       | -41AX   | -42AX   |

**Note:** 1. SPDT contact arrangement is standard. In general, normally open switches may be ordered by changing the suffix number from -00 to -01 and normally closed may be ordered by changing the suffix from -00 to -02. See above for assistance.  
2. E35 and E36 only available as light force with 0.250" QC terminals.

## Ordering Information

- Select the contact rating prefix you need (E21-E36).
- Combine the prefix with the corresponding terminal configuration. For example part number E21-00H will provide you with a gold crosspoint miniature switch with 0.187" QC terminals and a straight lever with a 0.865" actuation length
- To order a normally open version simply 'add 1' to the suffix to obtain E21-01H and normally closed 'add 2' for part number E21-02H.
- To order a E21-00H with .screw terminals, 'add' the new terminal code (-10) to the part number – E21-10H will be the resulting part number for a miniature switch with screw terminals and a straight lever with a 0.865" actuation length.

### Contact

Call, fax or visit our  
Website for more information.

**ZF Electronics Corporation**  
11200 88th Avenue  
Pleasant Prairie, WI 53158

The manufacturer accepts no  
liability for errors or non-availability,  
and reserves the right to change  
specifications without prior notice.

Technical data relates to product

<http://switches-sensors.zf.com/us/product/miniature-d4/>

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Last Updated: 061212

