

# TF Series Miniature Snap-acting Switches

## Features/Benefits

- Broad range of operating forces
- Ratings up to 21 AMPS
- Wide variety of actuator styles
- Quick connect terminations

## Typical Applications

- Motor controls
- Thermostatics
- Portable tools



## Specifications

CONTACT RATING: From low level\* to 21 AMPS @ 277 V AC.  
ELECTRICAL LIFE: 300,000 cycles at 10 AMPS @ 250 V AC, consult Customer Service Center for typical life of higher rated switches.  
INSULATION RESISTANCE: 1,000 M ohm min.  
DIELECTRIC STRENGTH: 1,500 Vrms min. @ sea level.  
OPERATING TEMPERATURE: -40°F to 185°F (-40°C to 85°C).  
OPERATING FORCE: From 15 to 400 grams at actuator button available.  
MOUNTING: Torque screws 2-5 in/lbs.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max. Standard electrical life per UL 1054, rated for 6,000 operations.

## Materials

SWITCH HOUSING: Thermoplastic (UL 94V-0).  
ACTUATOR BUTTON: Thermoplastic (UL 94V-0).  
SPRING: Copper alloy.  
PIVOT: Brass alloy.  
MOVABLE CONTACTS: Gold alloy for ratings 1 AMP or less.  
Fine silver for ratings greater than 1 AMP up to 15 AMPS.  
Precious metal alloy for ratings greater than 15 AMPS.  
STATIONARY CONTACTS: Gold alloy for ratings 1 AMP or less.  
Fine silver for ratings greater than 1 AMP.  
TERMINALS: Brass alloy for ratings up to 10 AMPS.  
Copper alloy for ratings greater than 10 AMPS.

**NOTE:** Specifications and materials listed above are switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages J-6 through J-10. For additional options not shown in catalog, consult Customer Service Center.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                                                                                                  |             |                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                                                 |             |                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------|-------------|----------------------------------------------------------|
| <div><div>T</div><div>F</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | <div></div>                                                                                                                                                                                      | <div></div> | <div></div>                                                                                                                                                                                                                                                                                                                                                                                                                        | <div></div> | <div></div>                                     | <div></div> | <div></div>                                              |
| <b>Series</b><br>TF SP, Mom.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | <b>Operating Force</b><br>CJ 5.29 oz./150 grams<br>CC .53 oz./15 grams<br>CD .88 oz./25 grams<br>CF 1.76 oz./50 grams<br>CG 2.65 oz./75 grams<br>EC 7.94 oz./225 grams<br>EE 14.11 oz./400 grams |             | <b>Electrical Rating</b><br>J6 15 A, 277 V AC; 1/2 HP, 125, 250 V AC;<br>5 A, 125 V AC "L", 0.5 A, 125 V DC;<br>0.25 A, 250 V DC<br>F5 1 A, 125 V AC; 1 A, 30 V DC<br>H8 5 A, 277 V AC; 1/10 HP, 125, 250 V AC<br>J3 21 A, 277 V AC; 1 HP, 125 V AC; 2 HP,<br>250 V AC; 5 A, 125 V AC "L"<br>K6 11 A, 277 V AC; 1/3 HP, 125, 250 V AC;<br>0.5 A, 125 V DC; 0.25 A, 250 V DC<br>L3 20 A, 250 V AC; 1 HP, 125 V AC;<br>2 HP 250 V AC |             | <b>Mounting Style</b><br>S Standard<br>V Metric |             | <b>Circuitry</b><br>C SPDT<br>W SPST N.C.<br>Y SPST N.O. |
| <b>Actuator</b><br>P00 Pin plunger<br>A10 .81" lever roller, high force<br>A15 1.34" lever roller, high force<br>A20 1.05" lever roller, low force<br>A25 1.56" lever roller, low force<br>T10 .84" lever, high force<br>T13 1.34" simulated roller, high force<br>T14 1.29" simulated roller, high force<br>T15 1.40" lever, high force<br>T16 2.34" lever, high force<br>T18 2.75" lever, high force<br>T20 1.10" lever, low force<br>T23 1.56" simulated roller, low force<br>T24 1.50" simulated roller, low force<br>T25 1.62" lever, low force<br>T26 2.57" lever, low force<br>T28 2.97" lever, low force<br>WPO Wide pin plunger |  | <b>Terminations</b><br>40 .187" quick connect<br>4A .250" quick connect<br>5A .250" offset quick connect<br>5B .187" offset quick connect                                                        |             |                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                                                 |             |                                                          |

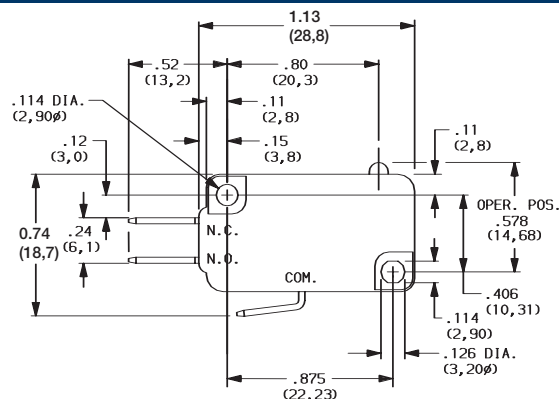
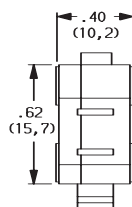


Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

TF Series  
Miniature Snap-acting Switches

SERIES

TF MINIATURE SNAP-ACTING SWITCHES – SP MOMENTARY



OPERATING FORCE

| OPTION CODE | BASIC SWITCH OPERATING FORCE (OZ./GRAMS) |
|-------------|------------------------------------------|
| CC          | .53<br>15                                |
| CD          | .88<br>25                                |
| CF          | 1.76<br>50                               |
| CG          | 2.65<br>75                               |
| CJ          | 5.29<br>150                              |
| EC          | 7.94<br>225                              |
| EE*         | 14.11<br>400                             |

\*Minimums may apply, consult Customer Service Center.

Operating Force option 'CC' not available with 'T18 & T26' Actuator options.  
Operating force varies with actuator option, see ACTUATOR option section.

ELECTRICAL RATING

| OPTION CODE | RoHS COMPLIANT * | RoHS COMPATIBLE * | CONTACT MATERIAL |                    | ELECTRICAL RATING       |
|-------------|------------------|-------------------|------------------|--------------------|--------------------------------------------------------------------------------------------------------------|
|             |                  |                   | MOVABLE CONTACT  | STATIONARY CONTACT |                                                                                                              |
| F5          | Yes              | Yes               | Gold alloy       | Gold alloy         | From low level* to 1 AMP @ 125 V AC, 1 AMP @ 30 V DC.                                                        |
| H8          | Yes              | Yes               | Fine Silver      | Fine Silver        | 5 AMPS @ 277 V AC; 1/10 HP @ 125 & 250 V AC.                                                                 |
| J3          | Yes              | Yes               |                  |                    | 21 AMPS @ 277 V AC; 1 HP @ 125 V AC; 2 HP @ 250 V AC; 5 AMPS @ 125 V AC "L".                                 |
| J6          | Yes              | Yes               |                  |                    | 15 AMPS @ 277 V AC; 1/2 HP @ 125 & 250 V AC; 5 AMPS @ 125 V AC "L". 0.5 AMP @ 125 V DC; 0.25 AMP @ 250 V DC. |
| K6          | Yes              | Yes               |                  |                    | 11 AMPS @ 277 V AC; 1/3 HP @ 125 & 250 V AC; 0.5 AMP @ 125 V DC; 0.25 AMP @ 250 V DC.                        |
|             |                  |                   | Silver alloy     |                    |                                                                                                              |
| L3          | Yes              | Yes               |                  |                    | 20 AMPS @ 250 V AC; 1 HP @ 125 V AC; 2 HP @ 250 V AC                                                         |

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

All models   
Consult Customer Service center for availability and delivery of nonstandard ratings.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.



Third Angle Projection

Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change



# TF Series Miniature Snap-acting Switches

## ELECTRICAL RATING

| INTERNATIONAL RATING SYMBOLS |                                                                                                              |
|------------------------------|--------------------------------------------------------------------------------------------------------------|
| μ                            | Microgap construction (less than 3 mm).                                                                      |
| ~                            | Alternating current.                                                                                         |
| T__                          | Maximum rated use temperature.                                                                               |
| 50E3                         | Cycles over 50,000 at rated current.                                                                         |
| 10E3                         | Cycles over 10,000 at rated current.                                                                         |
| 10(3)                        | Current Rating: First number represents resistive rating; second number represents inductive (motor) rating. |

| ELECTRICAL RATING | AMPS (REF.) | OPERATING FORCE |         |         |         |          |          |          |
|-------------------|-------------|-----------------|---------|---------|---------|----------|----------|----------|
|                   |             | CC (15)         | CD (25) | CF (50) | CG (75) | CJ (150) | EC (225) | EE (400) |
| F5                | 1           | •               | •       | •       | •       | •        | •        |          |
| H8                | 5           | •               | •       | •       | •       | •        | •        | •        |
| J3                | 21          | X               | X       | X       | X       | •        | •        | •        |
| J6                | 15          | X               | X       | X       | X       | •        | •        | •        |
| K6                | 11          | X               | •       | •       | •       | •        | •        | •        |
| L3                | 20          | X               | X       | X       | X       | •        | •        | •        |

All models 

Consult Customer Service center for availability and delivery of nonstandard ratings.

\* Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

• AVAILABLE

x NOT AVAILABLE

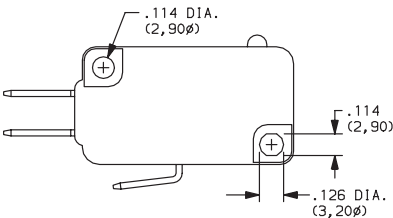
\*\* Available with 4A & 5A terminations only, see page J-10.



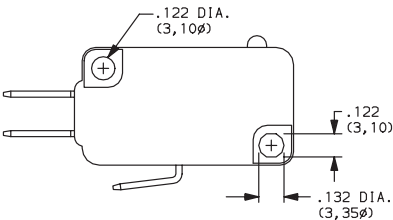
Snap-acting

## MOUNTING STYLE

**S** STANDARD  
For 4-40 screw size



**V** Metric  
For 3 mm screw size



Third Angle  
Projection

Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# TF Series Miniature Snap-acting Switches

ACTUATOR 

| OPTION CODE | FIG. | DIM. A         | DIM. B        | DIM. C                        | DIM. D             |
|-------------|------|----------------|---------------|-------------------------------|--------------------|
| <b>P00</b>  | 1    | .80<br>(20,3)  | —             | .578 ± .015<br>(14,68 ± 0,38) | —                  |
| <b>A10</b>  | 2    | .81<br>(20,6)  | .32<br>(8,1)  | .810 ± .020<br>(20,57 ± 0,51) | .19 dia.<br>(4,80) |
| <b>A15</b>  | 2    | 1.34<br>(34,0) | .32<br>(8,1)  | .810 ± .030<br>(20,57 ± 0,76) | .19 dia.<br>(4,80) |
| <b>A20</b>  | 2    | 1.05<br>(26,7) | .54<br>(13,7) | .810 ± .050<br>(20,57 ± 1,27) | .19 dia.<br>(4,80) |
| <b>A25</b>  | 2    | 1.56<br>(39,6) | .54<br>(13,7) | .810 ± .075<br>(20,57 ± 1,91) | .19 dia.<br>(4,80) |
| <b>T10</b>  | 3    | .84<br>(21,3)  | .32<br>(8,1)  | .600 ± .020<br>(15,24 ± 0,51) | —                  |
| <b>T15</b>  | 3    | 1.40<br>(35,6) | .32<br>(8,1)  | .600 ± .040<br>(15,24 ± 1,02) | —                  |
| <b>T16</b>  | 3    | 2.34<br>(59,4) | .32<br>(8,1)  | .600 ± .065<br>(15,24 ± 1,65) | —                  |
| <b>T18</b>  | 3    | 2.75<br>(69,9) | .32<br>(8,1)  | .600 ± .080<br>(15,24 ± 2,03) | —                  |
| <b>T20</b>  | 3    | 1.10<br>(27,9) | .54<br>(13,7) | .600 ± .050<br>(15,24 ± 1,27) | —                  |
| <b>T25</b>  | 3    | 1.62<br>(41,1) | .54<br>(13,7) | .600 ± .070<br>(15,24 ± 1,78) | —                  |
| <b>T26</b>  | 3    | 2.57<br>(65,3) | .54<br>(13,7) | .600 ± .150<br>(15,24 ± 3,81) | —                  |
| <b>T28</b>  | 3    | 2.97<br>(75,4) | .54<br>(13,7) | .600 ± .187<br>(15,24 ± 4,75) | —                  |
| <b>T13</b>  | 4    | 1.34<br>(34,0) | .32<br>(8,1)  | .810 ± .030<br>(20,57 ± 0,76) | .19 dia.<br>(4,80) |
| <b>T14</b>  | 4    | 1.29<br>(32,8) | .32<br>(8,1)  | .730 ± .030<br>(18,54 ± 0,76) | .19 dia.<br>(6,40) |
| <b>T23</b>  | 4    | 1.56<br>(39,6) | .54<br>(13,7) | .810 ± .065<br>(20,57 ± 1,65) | .19 dia.<br>(4,80) |
| <b>T24</b>  | 4    | 1.50<br>(38,1) | .54<br>(13,7) | .730 ± .060<br>(18,54 ± 1,52) | .25 dia.<br>(6,40) |
| <b>WP0</b>  | 5    | .80<br>(20,3)  | —             | .635 ± .015<br>(16,13 ± 0,38) | —                  |

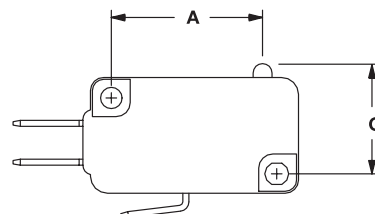


FIG. 1  
Pin Plunger

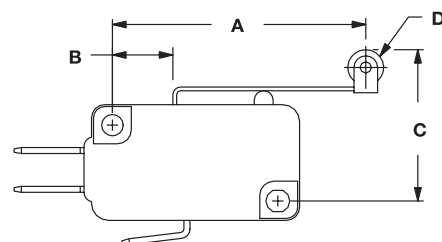


FIG. 2  
Lever Roller

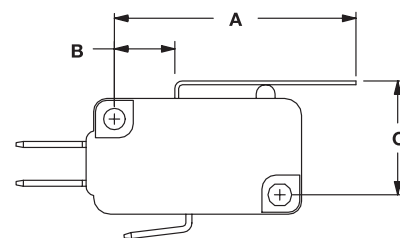


FIG. 3  
Lever

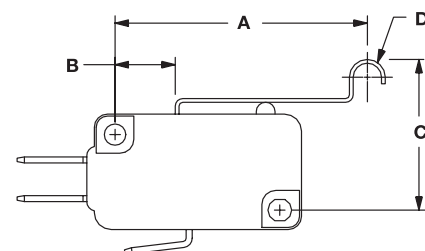


FIG. 4  
Simulated Roller

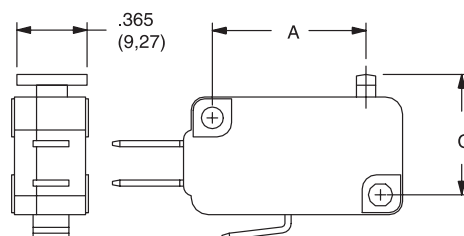
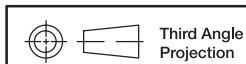


FIG. 5  
Wide Pin



Third Angle  
Projection

Dimensions are shown: Inch (mm)  
Specifications and dimensions subject to change

**C&K**

Snap-acting



# TF Series Miniature Snap-acting Switches

ACTUATOR 

## SWITCH CHARACTERISTICS

| OPTION CODE | MAXIMUM OPERATING FORCE (OZ./GRAMS) |            |            |            |             |             |              | MINIMUM RELEASE FORCE (OZ./GRAMS) |           |           |            |            |            |             | MAXIMUM DIFFERENTIAL TRAVEL | MAXIMUM PRETRAVEL | MINIMUM OVERTRAVEL |
|-------------|-------------------------------------|------------|------------|------------|-------------|-------------|--------------|-----------------------------------|-----------|-----------|------------|------------|------------|-------------|-----------------------------|-------------------|--------------------|
|             | CC (15)                             | CD (25)    | CF (50)    | CG (75)    | CJ (150)    | EC (225)    | EE (400)     | CC (15)                           | CD (25)   | CF (50)   | CG (75)    | CJ (150)   | EC (225)   | EE (400)    | ALL FORCES                  | ALL FORCES        | ALL FORCES         |
| A10         | .63<br>18                           | 1.06<br>30 | 2.29<br>65 | 3.17<br>90 | 6.35<br>180 | 7.94<br>225 | 14.11<br>400 | .21<br>6                          | .35<br>10 | .35<br>10 | .53<br>15  | .71<br>20  | 1.98<br>56 | 3.88<br>110 | .015<br>(0,38)              | .060<br>(1,52)    | .030<br>(0,76)     |
| A15         | .28<br>8                            | .42<br>12  | 1.06<br>30 | 1.59<br>45 | 3<br>85     | 4.59<br>130 | 7.94<br>225  | .07<br>2                          | .14<br>4  | .14<br>4  | .18<br>5   | .35<br>10  | .71<br>20  | 2.82<br>80  | .030<br>(0,76)              | .100<br>(2,54)    | .065<br>(1,65)     |
| A20         | 0.53<br>15                          | 0.71<br>20 | 1.41<br>40 | 2.12<br>60 | 4.23<br>120 | 6<br>170    | 9.7<br>275   | 0.07<br>2                         | 0.11<br>3 | 0.11<br>3 | 0.18<br>5  | 0.42<br>12 | 0.71<br>20 | 1.41<br>40  | 0.025<br>(0,64)             | 0.12<br>(3,05)    | 0.055<br>(1,40)    |
| A25         | .18<br>5                            | .28<br>8   | .56<br>16  | .85<br>24  | 1.69<br>48  | 2.65<br>75  | 4.41<br>125  | .04<br>1                          | .07<br>2  | .07<br>2  | .07<br>2   | .21<br>6   | .35<br>10  | .71<br>20   | .050<br>(1,27)              | .250<br>(6,35)    | .120<br>(3,05)     |
| P00         | .53<br>15                           | .88<br>25  | 1.76<br>50 | 2.65<br>75 | 5.29<br>150 | 7.94<br>225 | 14.11<br>400 | .21<br>6                          | .35<br>10 | .35<br>10 | .53<br>15  | 1.23<br>35 | 1.98<br>56 | 3.88<br>110 | .010<br>(0,25)              | .047<br>(1,19)    | .050<br>(1,27)     |
| T10         | .63<br>18                           | 1.06<br>30 | 2.29<br>65 | 3.17<br>90 | 6.35<br>180 | 7.94<br>225 | 14.11<br>400 | .21<br>6                          | .35<br>10 | .35<br>10 | .53<br>15  | .71<br>20  | 1.98<br>56 | 3.88<br>110 | .015<br>(0,38)              | .060<br>(1,52)    | .030<br>(0,76)     |
| T13         | .28<br>8                            | .42<br>12  | 1.06<br>30 | 1.59<br>45 | 3<br>85     | 4.59<br>130 | 7.94<br>225  | .07<br>2                          | .14<br>4  | .14<br>4  | .18<br>5   | .35<br>10  | .71<br>20  | 2.82<br>80  | .030<br>(0,76)              | .100<br>(2,54)    | .065<br>(1,65)     |
| T14         | .28<br>8                            | .42<br>12  | 1.23<br>35 | 1.76<br>50 | 3.17<br>90  | 4.76<br>135 | 7.94<br>225  | .07<br>2                          | .14<br>4  | .14<br>4  | .18<br>5   | .35<br>10  | .71<br>20  | 2.82<br>80  | .030<br>(0,76)              | .100<br>(2,54)    | .060<br>(1,52)     |
| T15         | .25<br>7                            | .42<br>12  | 1.06<br>30 | 1.41<br>40 | 2.82<br>80  | 4.41<br>125 | 7.94<br>225  | .07<br>2                          | .14<br>4  | .14<br>4  | .18<br>5   | .28<br>8   | .63<br>18  | 2.82<br>80  | .030<br>(0,76)              | .110<br>(2,79)    | .065<br>(1,65)     |
| T16         | .18<br>5                            | .28<br>8   | .53<br>15  | .78<br>22  | 1.59<br>45  | 2.47<br>70  | 4.23<br>120  | .04<br>1                          | .07<br>2  | .07<br>2  | .07<br>2   | .28<br>8   | .35<br>10  | .71<br>20   | .045<br>(1,14)              | .250<br>(6,35)    | .125<br>(3,18)     |
| T18         | N/A                                 | .21<br>6   | .42<br>12  | .71<br>20  | 1.41<br>40  | 2.12<br>60  | 3.53<br>100  | N/A                               | .04<br>1  | .04<br>1  | .07<br>2   | .18<br>5   | .28<br>8   | .56<br>16   | .062<br>(1,57)              | .300<br>(7,62)    | .155<br>(3,94)     |
| T20         | .53<br>15                           | .71<br>20  | 1.41<br>40 | 2.12<br>60 | 4.23<br>120 | 6<br>170    | 9.70<br>275  | .21<br>6                          | .35<br>10 | .35<br>10 | .53<br>15  | .71<br>20  | 1.98<br>56 | 3.88<br>110 | .030<br>(0,76)              | .140<br>(3,56)    | .060<br>(1,52)     |
| T23         | .18<br>5                            | .28<br>8   | .56<br>16  | .85<br>24  | 1.69<br>48  | 2.65<br>75  | 4.41<br>125  | .04<br>1                          | .07<br>2  | .07<br>2  | .07<br>2   | .21<br>6   | .35<br>10  | .71<br>20   | .050<br>(1,27)              | .250<br>(6,35)    | .120<br>(3,05)     |
| T24         | 0.18<br>5                           | 0.28<br>8  | 0.56<br>16 | 0.88<br>25 | 1.76<br>50  | 2.65<br>75  | 4.76<br>135  | 0.04<br>1                         | 0.07<br>2 | 0.07<br>2 | 0.11<br>3  | 0.21<br>6  | 0.35<br>10 | 0.71<br>20  | .005<br>(1,27)              | 0.23<br>(5,84)    | 0.11<br>(2,79)     |
| T25         | .18<br>5                            | .28<br>8   | .53<br>15  | .88<br>25  | 1.59<br>45  | 2.47<br>70  | 4.23<br>120  | .04<br>1                          | .07<br>2  | .07<br>2  | .07<br>2   | .21<br>6   | .35<br>10  | .99<br>28   | .055<br>(1,40)              | .250<br>(6,35)    | .125<br>(3,18)     |
| T26         | N/A                                 | .14<br>4   | .28<br>8   | .42<br>24  | .85<br>24   | 1.27<br>36  | 2.26<br>64   | N/A                               | .04<br>1  | .04<br>1  | .05<br>1.5 | .12<br>3.5 | .21<br>6   | .39<br>11   | .100<br>(2,54)              | .500<br>(12,70)   | .235<br>(5,97)     |
| T28         | N/A                                 | N/A        | N/A        | 0.42<br>12 | 0.71<br>20  | 1.06<br>30  | 1.94<br>55   | N/A                               | N/A       | N/A       | 0.04<br>1  | 0.11<br>3  | 0.18<br>5  | 0.32<br>9   | 0.12<br>(3,05)              | .0560<br>(14,22)  | 0.285<br>(7,24)    |
| WP0         | .53<br>15                           | .88<br>25  | 1.76<br>50 | 2.65<br>75 | 5.29<br>150 | 7.94<br>225 | 14.11<br>400 | .21<br>6                          | .35<br>10 | .35<br>10 | .53<br>15  | 1.23<br>35 | 1.97<br>56 | 3.88<br>110 | .010<br>(0,25)              | .047<br>(1,19)    | .030<br>(0,51)     |

**NOTE:** For basic switch operating forces, see page J-6.

### HIGH FORCE, LOW MOTION PIVOT POSITION



Available with actuators A10, A15, T10, T13, T14, T15, T16 and T18.

### LOW FORCE, HIGH MOTION PIVOT POSITION



Available with actuators A20, A25, T20, T23, T24, T25, T26, and T28.

**NOTE:** Lever actuator options are available in either of two pivot positions. Levers located in the forward pivot position have lower forces and higher motions. Levers located in the rear pivot position have higher forces and lower motions.



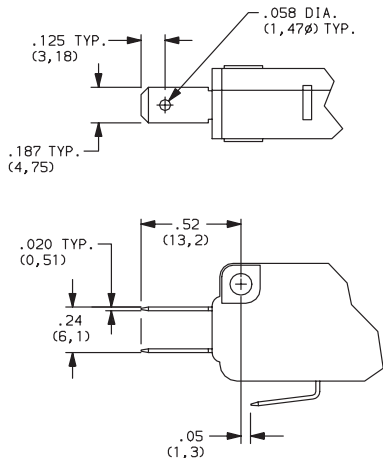
Dimensions are shown: Inches (mm)

Specifications and dimensions subject to change

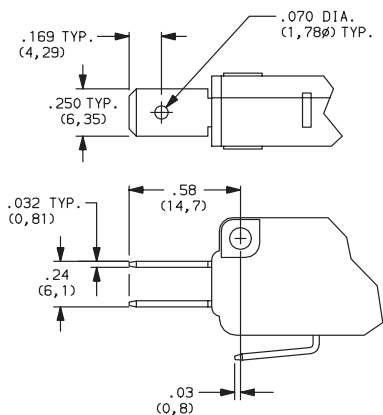
# TF Series Miniature Snap-acting Switches

## TERMINATIONS

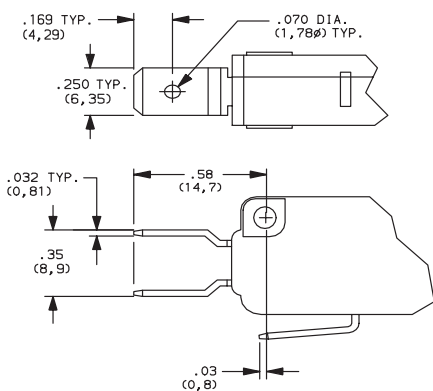
40 .187" QUICK CONNECT



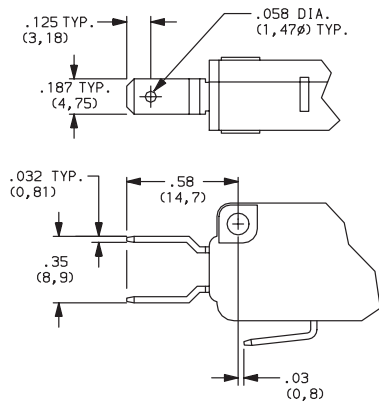
4A .250" QUICK CONNECT



5A OFFSET .250" QUICK CONNECT



5B OFFSET .187" QUICK CONNECT



## CIRCUITRY

- C** SPDT (Single Pole, Double Throw)
- W** SPST N.C. (Single Pole, Single Throw, Normally Closed)
- Y** SPST N.O. (Single Pole, Single Throw, Normally Open)