



# ITW SWITCHES SNAP ACTION SWITCHES

Design, development and manufacture of switch solutions

 PUSH BUTTON

 SNAP ACTION

 ACTUATORS

 SLIDE

 ROTARY

 CUSTOM ASSEMBLIES

 MILITARY / AEROSPACE



**ITW Switches**  
SENSORS, SWITCHES, ELECTRONIC CONTROLS



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# LICON — SNAP ACTION SWITCHES

|   |                 |
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## Series 11

### MINIATURE 10 AMP DOUBLE-BREAK SNAP ACTION SWITCHES

This rugged miniature switch features the Butterfly® double-break snap action switch mechanism. It is ideal for tough applications where high current capability and Butterfly® reliability are needed.



#### APPLICATIONS

- Welding guns
- Pipeline valve actuator
- Discrete length tape dispenser machines
- Lift trucks
- Electrical contractors

#### KEY FEATURES:

- Gold or silver contacts
- Variety of terminals configurations and styles available
- UL recognized and CSA certified
- Reset style switch available
- Roller lever and overtravel plunger actuator are available

ACTUAL SIZE

#### ORDERING INFORMATION:

##### Switches

| Part Number         | Terminals             |
|---------------------|-----------------------|
| <b>11-104</b>       | End Solder            |
| <b>11-204</b>       | #4 Screw              |
| <b>11-304</b>       | Side Solder           |
| <b>11-314 Reset</b> | Side Solder           |
| <b>11-504</b>       | Quick Disconnect .250 |

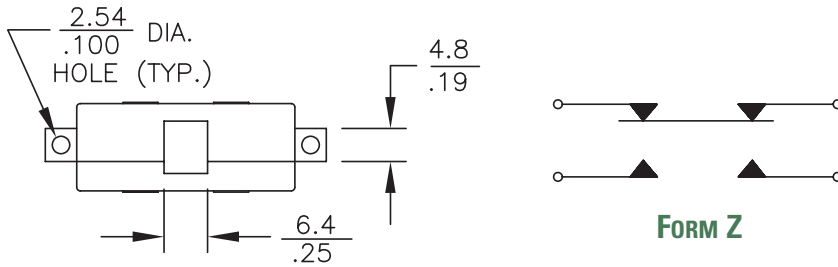
##### Actuators (see page 68 for additional specifications)

| Part Number                    | Oper. Force | Release Force | Pretravel | Overtravel | Movement Diff. | Operating Point |
|--------------------------------|-------------|---------------|-----------|------------|----------------|-----------------|
| <b>71-1040</b><br>Roller Lever | 3.5 oz max  | 2 oz min      | .093 max  | .062 min   | .030 ± .015    | .671 ± .031     |
| <b>71-2010</b><br>Over Travel  | 8 ± 3 oz    | 4 oz min      | .050 max  | .215 min   | .020 ± .005    | .828 ± .015     |

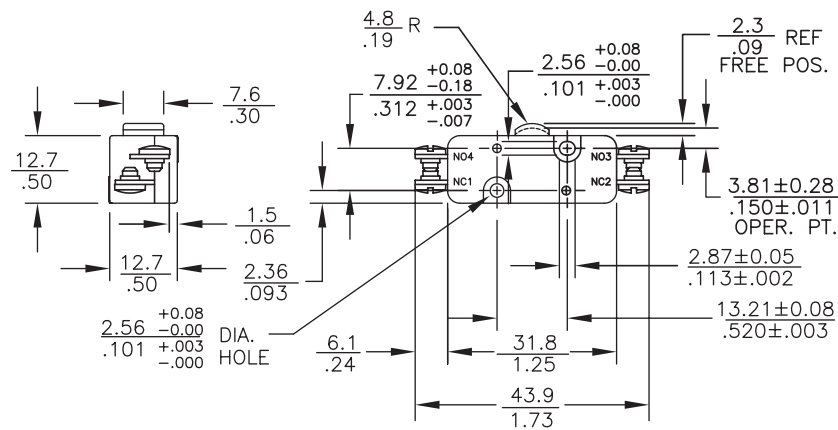
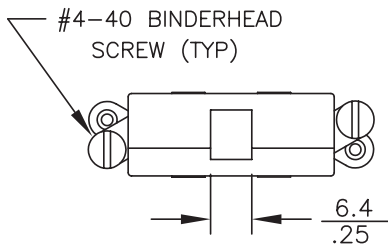
#### STANDARDS / AGENCY / RATINGS:



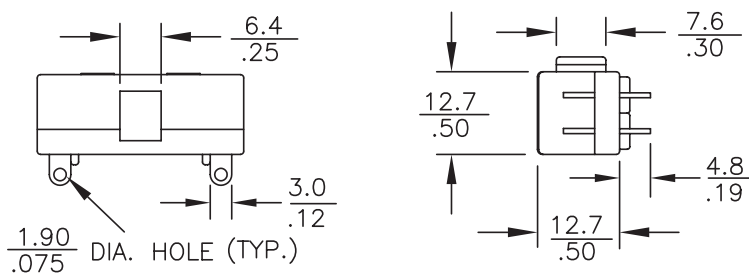
**END SOLDER**



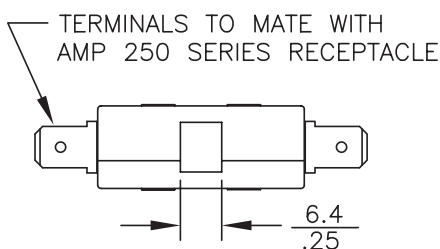
**# 4 SCREW**



**SIDE SOLDER**



**QUICK DISCONNECT**



**MECHANICAL / ELECTRICAL CHARACTERISTICS:**

- Pretravel:**  
0.050 inches max
- Overtravel:**  
0.015 inches min
- Operating Force:**  
8 oz + 3 oz
- Release Force:**  
4 oz min
- Movement Differential:**  
0.020 ± 0.007 inches
- Operating Point:**  
0.150 ± 0.011 inches  
(from mounting hold centers)
- Circuit:**  
SPDT-DB (Form Z)

**Electrical Ratings (Typical):**

| Circuitry                                   | 125/250 VAC                                | 28 VDC                   |
|---|--|--------------------------|
| SPST-DB<br>NC (Form Y)<br>or<br>NO (Form X) | 10 amp<br>(75-80% PF)<br>1/2 HP<br>125 VAC | 10 amp Ind<br>15 amp Res |
| SPDT-DB<br>(Form Z)                         | 3/4 HP<br>250 VAC                          | 7 amp Ind<br>10 amp Res  |
| SPDT-SB<br>(Form C)                         |  | 4 amp Ind<br>6 amp Res   |



## Series 14

### HEAVY DUTY 20 AMP DOUBLE-BREAK SWITCHES

This rugged single-pole double-break Butterfly® switch will handle up to 20 amps. Ideal for high-current applications which require long life and reliability.



### APPLICATIONS

- Train car door operators
- Bus door operators
- Pendant controls
- Lift trucks
- Heavy industrial machinery

### KEY FEATURES:

- Available in standard or heavy duty mounting
- Semirefactory contacts and offset #6 screw terminals with cup washers are standard
- Sealed button actuator is available
- Button, overtravel plunger or pivoted lever actuator are available
- UL recognized and CSA certified

### ORDERING INFORMATION:

| Part Number | Mounting   | Operating Force | Release Force | Pretravel | Overtravel | Movement Differential | Operating Point | Actuator Style           |
|-------------|------------|-----------------|---------------|-----------|------------|-----------------------|-----------------|--------------------------|
| 14-124      | Standard   | 12 ± 3 oz       | 4 oz min      | .074 max  | .030 min   | .020 ± .007           | .808 ± .013     | Standard Button Actuator |
| 14-12404    | Heavy Duty | 12 ± 3 oz       | 4 oz min      | .074 max  | .030 min   | .021 ± .007           | .090 ± .053     | Standard Button Actuator |
| 14-324      | Standard   | 12 ± 3 oz       | 4 oz min      | .074 max  | .219 min   | .020 ± .007           | .830 ± .036     | Overtravel Panel Mount   |
| 14-724      | Standard   | 5 ± 2 oz        | 2 oz min      | .156 max  | .060 min   | .046 ± .017           | 1.406 ± .034    | Roller Lever Actuator    |

### Electrical Ratings:

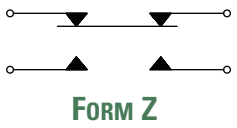
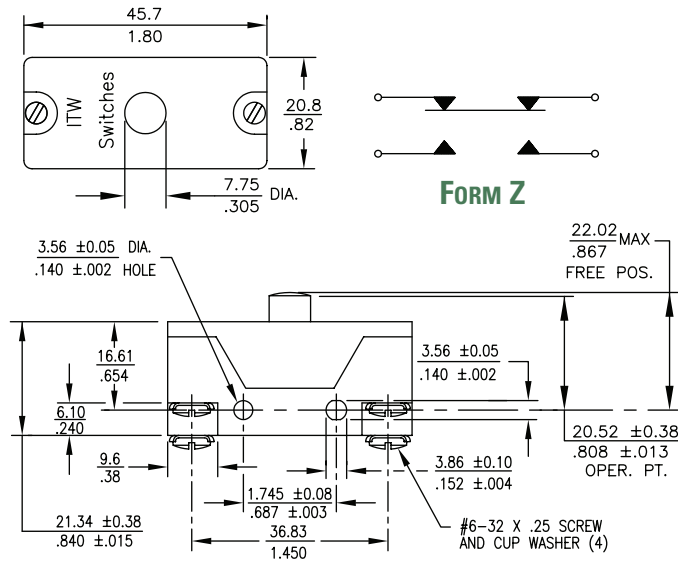
| Circuitry       | Volts | AC     |         | DC   |      |
|-----------------|-------|--------|---------|------|------|
|                 |       | Steady | In-Rush | SPDT | SPST |
| SPDT-DB(Form Z) | 28    | 20     | 80      | 10.0 | 25.0 |
| SPDT-DB(Form Z) | 125   | 20     | 80      | —    | —    |
| SPDT-DB(Form Z) | 250   | 20     | 80      | —    | —    |
| SPDT-DB(Form Z) | 480   | 20     | 50      | —    | —    |

UL recognized. Amps @ 125/250/480 VAC 78-80%PF and CSA Certified File No. 16388.  
1 HP 125 VAC, 2 HP 250 VAC. Materials recognized by UL for use at temperatures not exceeding 105° C (220° F)

### STANDARDS / AGENCY / RATINGS:



STANDARD BUTTON ACTUATOR



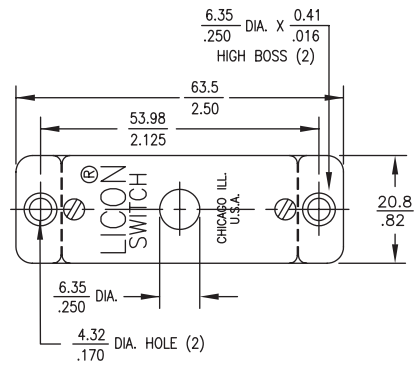
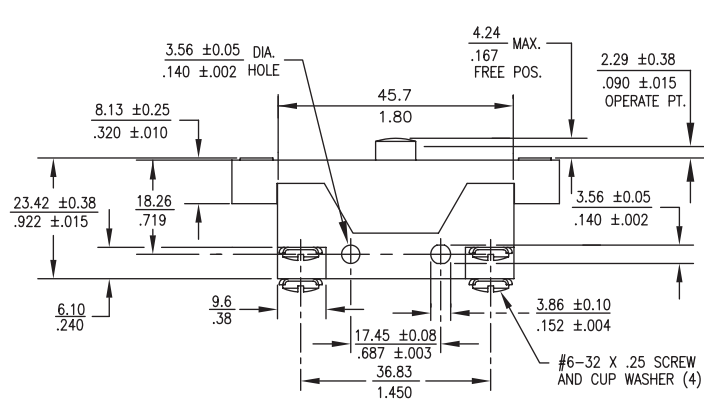
**MECHANICAL / ELECTRICAL CHARACTERISTICS:**

**Circuit:**  
SPDT-DB (Form Z)

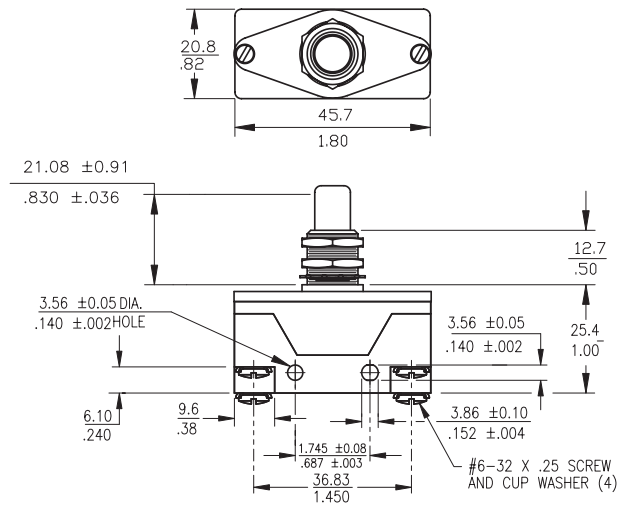
**Terminal:**  
#6 screw with cup washer

**Electrical Ratings :**  
See chart on left

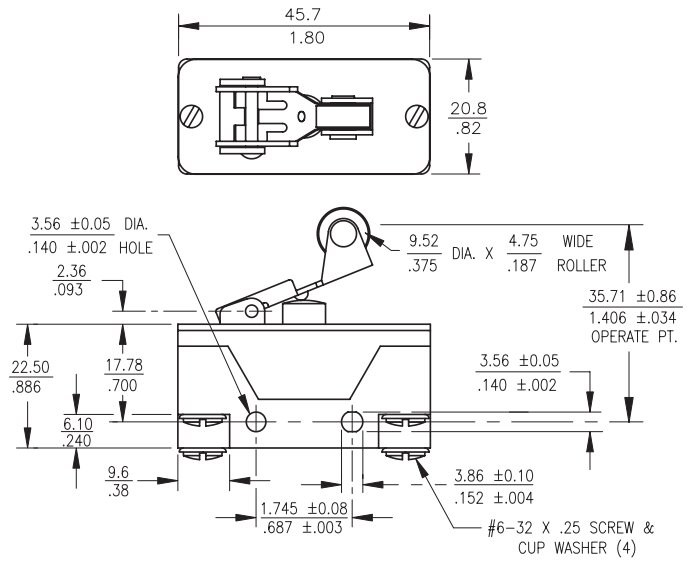
STANDARD BUTTON ACTUATOR—HEAVY DUTY MOUNTING



OVERTRAVEL PANEL MOUNT



ROLLER LEVER



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## Series 16

### SUB-MINIATURE 10.1 AMP DOUBLE-BREAK SNAP ACTION SWITCHES

Series 16 switches feature the Butterfly® double-break momentary switch mechanism. This offers the capability of handling high (or low) current loads in a small switch and gives the options of controlling two circuits with the Form Z switch circuitry.

#### APPLICATIONS

- Lift truck seat switch
- Aircraft contactor or actuator
- Sump pump float switch
- Valve actuator
- Industrial equipment and machinery
- Office equipment

#### KEY FEATURES:

- Gold or silver contacts
- Meets MIL-PRF-8805/7
- UL recognized and CSA certified: 10.1 amps @ 125/250 VAC
- Variety of terminal configurations and styles
- Roller lever, lever, short roller lever and bushing mount actuator are available

ACTUAL SIZE

#### ORDERING INFORMATION:

| Part Number  | Circuit       | Temperature Index | Contacts    | Terminals      | RoHS Compliant |
|--------------|---------------|-------------------|-------------|----------------|----------------|
| 16-104       | SPDT (Form Z) | To 275°F Ambient  | Silver **   | End Solder     | ✓              |
| 16-188051    | SPDT (Form Z) | To 275°F Ambient  | Gold Plated | End Solder     | ✓              |
| 16-204       | SPDT (Form Z) | To 275°F Ambient  | Silver **   | End Screw      | —              |
| 16-304       | SPDT (Form Z) | To 275°F Ambient  | Silver **   | Side Solder    | ✓              |
| 16-404       | SPDT (Form Z) | To 275°F Ambient  | Silver **   | Bottom Solder  | ✓              |
| 16-40401     | SPDT (Form Z) | To 275°F Ambient  | Gold Plated | Bottom Solder  | ✓              |
| 16-4044*     | SPDT (Form Z) | To 275°F Ambient  | Silver **   | Bottom Solder  | ✓              |
| 16-40441*    | SPDT (Form Z) | To 275°F Ambient  | Gold Plated | Bottom Solder  | ✓              |
| 16-488051    | SPDT (Form Z) | To 275°F Ambient  | Gold Plated | Bottom Solder  | —              |
| 16-530004*** | SPDT (Form Z) | To 275°F Ambient  | Silver **   | Bottom QC .110 | ✓              |

\* Thermoplastic case and cover.

\*\* For electrical loads under 250mA, consult factory.

\*\*\* Mounts easily to Series 76-95 Switches.

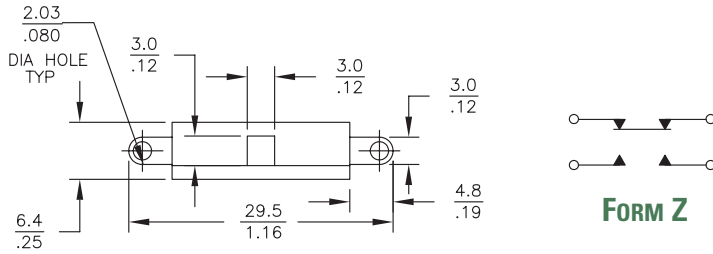
#### Actuators (see page 69 for additional specifications)

| Part Number                   | Switch Series | Oper. Force         | Release Force | Pretravel | Overtravel | Movement Diff. |
|-------------------------------|---------------|---------------------|---------------|-----------|------------|----------------|
| 76-1200<br>Roller Lever       | 16            | 4 oz max            | 1 oz min      | .125 max  | .025 min   | .045 ± .011    |
| 76-1210<br>Lever              | 16            | 2.5 oz max          | 1 oz min      | .125 max  | .025 min   | .047 ± .013    |
| 76-1220<br>Short Roller Lever | 16            | 5 + 3 oz - 2 oz min | 2 oz min      | .050 max  | .023 min   | .020 ± .005    |
| 76-22604<br>Bushing Mount     | 16            | 5 oz                | —             | .050 max  | .156 MIN   | —              |

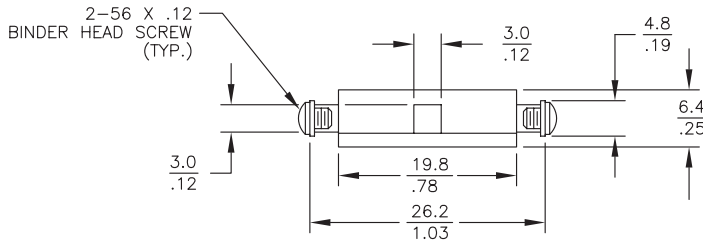
#### STANDARDS / AGENCY / RATINGS:



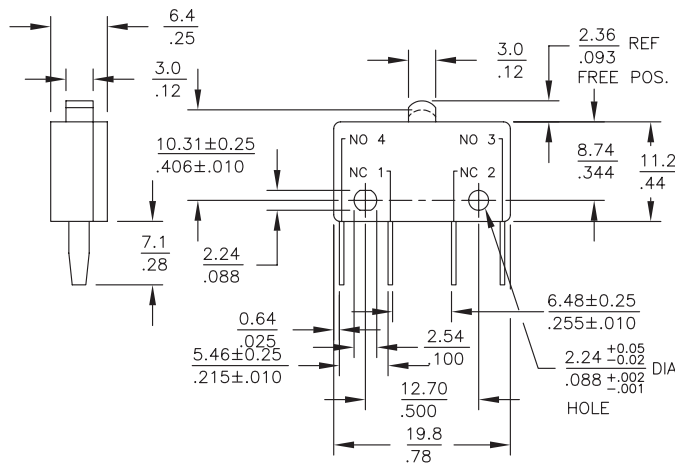
**END SOLDER**



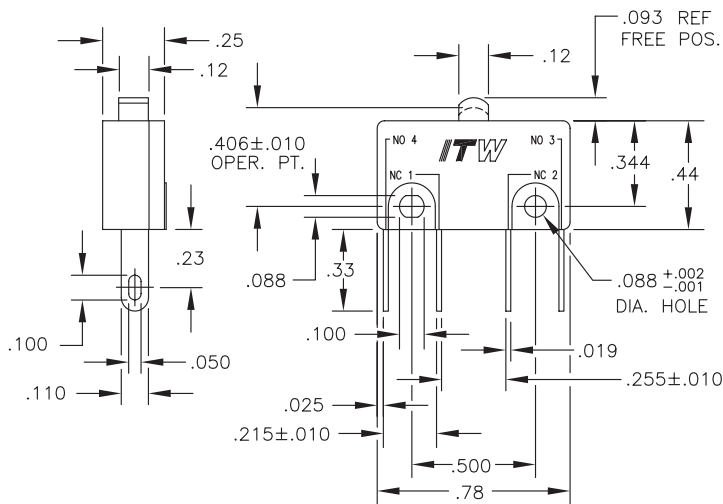
**END SCREW**



**QC TAPER TAB**



**BOTTOM QC .110**



**MECHANICAL / ELECTRICAL CHARACTERISTICS:**

**Pretravel:**  
0.050 inches max

**Overtravel:**  
0.012 inches min

**Operating Force:**  
5 oz + 3 oz - 2 oz

**Release Force:**  
2 oz min

**Movement Differential:**  
0.020 inches ± 0.005

**Operating Point:**  
0.406 inches ± 0.010  
(from mounting hold centers)

**Circuit:**  
SPDT-DB (Form Z)

**Temperature Index:**  
-54°C to +135°C  
(-65°F to +275°F)

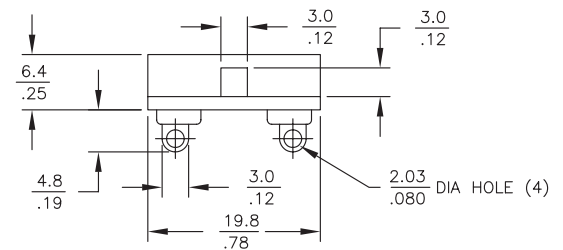
**MIL-PRF-8805/7 QPL listed:**  
16-188051 MS25476-1  
16-488051 MS27217-1

**Electrical Rating @ 28VDC:**

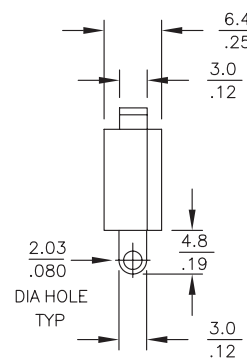
|                     |      | Sea Level | 70,000 Feet |
|---------------------|------|-----------|-------------|
| Form Z<br>2 Circuit | Res  | 10A       | 10A         |
|                     | Ind* | 5A        | 2A          |
|                     | Lamp | 3A        | —           |

\*L/R = .026

**SIDE SOLDER**



**BOTTOM SOLDER**





## Series KAP 16

### SUB-MINIATURE 10.1 AMP DOUBLE-BREAK SNAP ACTION SWITCHES

Similar to Series 16 switches with improved materials and performance. Ideal for critical applications where long life and reliability are needed.

#### APPLICATIONS

- Lift truck seat switch
- Aircraft contactor
- Sump pump float switch
- Aircraft actuator
- Valve actuator
- Industrial equipment and machinery
- Office equipment
- Medical equipment

#### KEY FEATURES:

- Enhanced gold contacts for high or low power applications
- Thermoplastic case sealed to prevent flux intrusion
- Meets MIL-PRF-8805 requirements
- Roller lever, lever, short roller lever and bushing mount actuator are available.



ACTUAL SIZE

#### ORDERING INFORMATION:

##### Switches

| Part Number   | Contacts      | Terminals |
|---------------|---------------|-----------|
| <b>16-110</b> | Enhanced Gold | End       |
| <b>16-111</b> | Silver        | End       |
| <b>16-410</b> | Enhanced Gold | Bottom    |

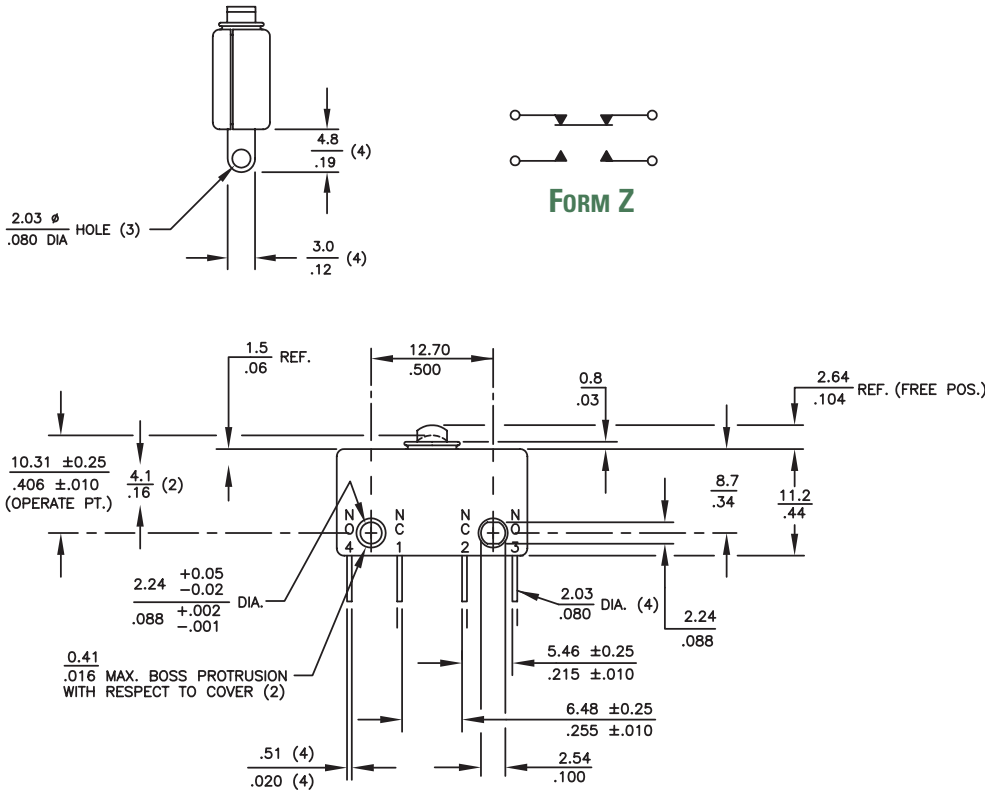
##### Actuator (see page 69 for additional specifications)

| Part Number                          | Switch Series | Oper. Force         | Release Force | Pretravel | Overtravel | Movement Diff. |
|--------------------------------------|---------------|---------------------|---------------|-----------|------------|----------------|
| <b>76-1200</b><br>Roller Lever       | 16            | 4 oz max            | 1 oz min      | .125 max  | .025 min   | .045 ± .011    |
| <b>76-1210</b><br>Lever              | 16            | 2.5 oz max          | 1 oz min      | .125 max  | .025 min   | .047 ± .013    |
| <b>76-1220</b><br>Short Roller Lever | 16            | 5 + 3 oz - 2 oz min | 2 oz min      | .050 max  | .023 min   | .020 ± .005    |
| <b>76-22604</b><br>Bushing Mount     | 16            | 5 oz                | —             | .050 max  | .156 min   | —              |

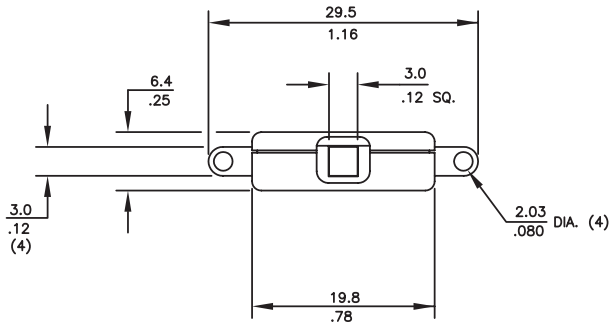
#### STANDARDS / AGENCY / RATINGS:



**BOTTOM SOLDER**



**END SOLDER**



**MECHANICAL / ELECTRICAL CHARACTERISTICS:**

- Pretravel:**  
0.050 inches max
- Overtravel:**  
0.012 inches min
- Operating Force:**  
5 oz + 3 oz - 2 oz
- Release Force:**  
2 oz min
- Movement Differential:**  
0.020 inches ± 0.005
- Operating Point:**  
0.406 inches ± 0.010  
(from mounting hole centers)
- Circuit:**  
SPDT-DB (Form Z)
- Temperature Index:**  
-65°C to +125°C  
(-85°F to +257°F)

**Electrical Rating @ 28VDC:**

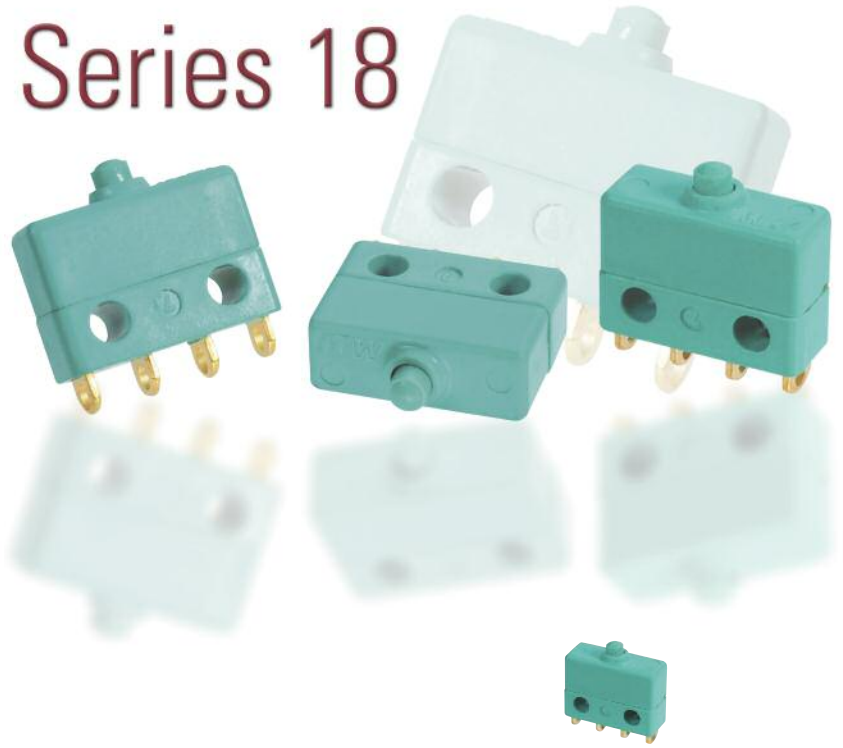
|                     |      | Sea Level | 70,000 Feet |
|---------------------|------|-----------|-------------|
| Form Z<br>2 Circuit | Res  | 10A       | 10A         |
|                     | Ind* | 5A        | 2A          |
|                     | Lamp | 3A        | —           |

\*L/R = .026

## Series 18

### ULTRA SUB-MINIATURE 7 AMP DOUBLE-BREAK SNAP ACTION SWITCHES

Series 18 switches feature the Butterfly® double-break momentary switch mechanism. This very small package can carry a full 7 amp load (or low current load).



ACTUAL SIZE

### APPLICATIONS

- Industrial valve controls
- Aircraft rotary actuator
- Aircraft linear actuator
- Float control pumps
- Spool valves
- Medical equipment
- Aircraft fuel valves
- Pressure switches

### KEY FEATURES:

- Gold contacts
- Solder terminals
- Meets MIL-S-8805/76
- UL recognized and CSA certified: 7 amps @ 125/250 VAC
- Lever and roller actuator are available

### ORDERING INFORMATION:

#### Switches

| Part Number                     | Contacts    | Terminals  | RoHS Compliant |
|---------------------------------|-------------|------------|----------------|
| <b>18-40421</b>                 | Gold Plated | End Solder | ✓              |
| <b>18-488051</b><br>(MS27257-1) | Gold Plated | End Solder | ✓              |

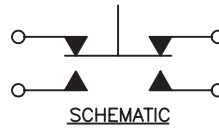
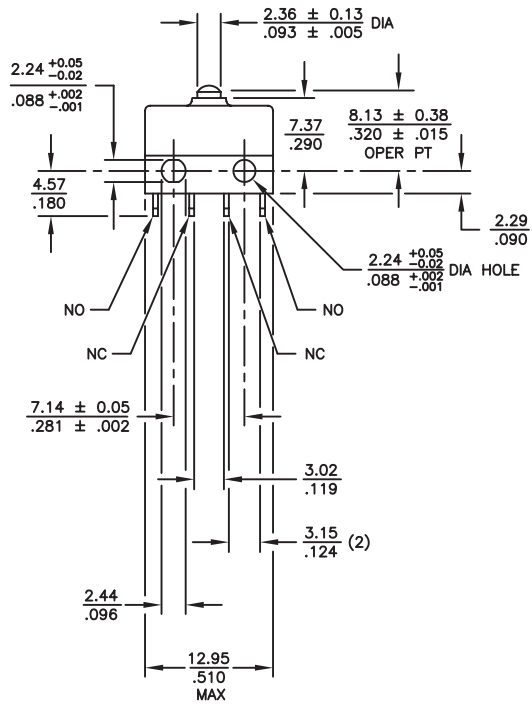
#### Actuator (see page 70 for additional specifications)

| Part Number                    | Oper. Force | Release Force | Pretravel | Overtravel | Movement Diff. | Operating Point |
|--------------------------------|-------------|---------------|-----------|------------|----------------|-----------------|
| <b>78-3000</b><br>Spring Lever | 6 ± 2 oz    | 2 oz min      | .125 max  | .030 min   | .030 ± .015    | .325 ± .030     |
| <b>78-3100</b><br>Roller Lever | 6 ± 2 oz    | 2 oz min      | .125 max  | .030 min   | .035 ± .015    | .560±.030       |

### STANDARDS / AGENCY / RATINGS:



PRODUCT DRAWINGS

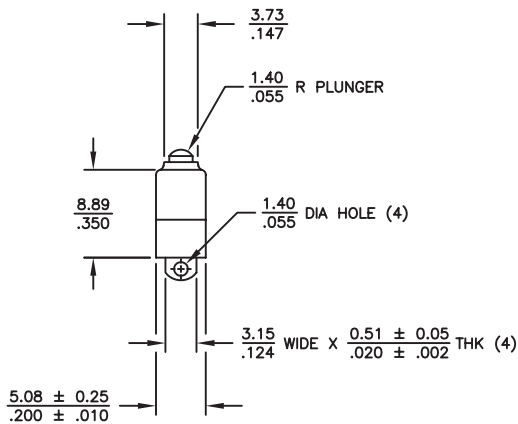


MECHANICAL / ELECTRICAL CHARACTERISTICS:

- Pretravel:**  
0.030 inches max
- Overtravel:**  
0.006 inches min
- Operating Force:**  
5 oz + 3 oz - 2 oz
- Release Force:**  
1.5 oz min
- Movement Differential:**  
0.015 inches ± 0.005
- Operating Point:**  
0.320 inches ± 0.015  
(from mounting hole centers)
- Circuit:**  
SPDT-DB (Form Z)
- MIL-PRF-8805/77 QPL listed:**  
18-488051 MS27257-1
- Electrical Rating @ 28VDC:**

| Circuitry           | Current                 |
|---------------------|-------------------------|
| 2 Circuit (SPDT-DB) | 5 amp Res<br>3 amp Ind* |
| 1 Circuit (SPST)    | 8 amp Res<br>7 amp Ind* |

\*L/R = .026



## Series 19

### 5-AMP SUB-MINIATURE SWITCHES

This fully sealed snap action switch series is ideal for applications in harsh environments where ingress of water and dust must be prevented.



### APPLICATIONS

- Industrial equipment
- Battery chargers for cordless tools
- Medical equipment
- Welding guns

### KEY FEATURES:

- Insert molded terminals—fully sealed base
- Meets IP67
- BEAB and ENEC approvals
- SPDT (Form C) circuitry
- Choice of actuator
- Silver or gold contacts
- Non-flammable switch UL94-V0 rated materials

ACTUAL SIZE

### ORDERING INFORMATION:

| Part Number | Contacts | Actuator Style* | Terminal Style       | Sealed | RoHS Compliant | IP67 Compliant |
|-------------|----------|-----------------|----------------------|--------|----------------|----------------|
| 19N402      | Silver   | Plunger         | Solder               | Yes    | ✓              | ✓              |
| 19N402L18   | Silver   | Leaf lever      | Solder               | Yes    | ✓              | ✓              |
| 19N402R15   | Silver   | Roller lever    | Solder               | Yes    | ✓              | ✓              |
| 19N403      | Silver   | Plunger         | Solder               | No     | ✓              | —              |
| 19N412      | Gold     | Plunger         | Solder               | Yes    | ✓              | ✓              |
| 19N502      | Silver   | Plunger         | P.C.                 | Yes    | ✓              | ✓              |
| 19N503      | Silver   | Plunger         | P.C.                 | No     | ✓              | —              |
| 19N512      | Gold     | Plunger         | P.C.                 | Yes    | ✓              | ✓              |
| 19N602      | Silver   | Plunger         | Q.C.                 | Yes    | ✓              | ✓              |
| 19N603      | Silver   | Plunger         | Q.C.                 | No     | ✓              | —              |
| 19N702      | Silver   | Plunger         | Wire Leads           | Yes    | ✓              | ✓              |
| 19N712      | Gold     | Plunger         | Wire Leads           | Yes    | ✓              | ✓              |
| 19N703      | Silver   | Plunger         | Wire Leads           | No     | ✓              | —              |
| 19N713      | Silver   | Plunger         | Wire Leads           | No     | ✓              | —              |
| 19N920      | Gold     | Plunger         | P.C. Right Angle (L) | Yes    | —              | ✓              |
| 19N922      | Gold     | Lever           | P.C. Right Angle (R) | Yes    | —              | ✓              |

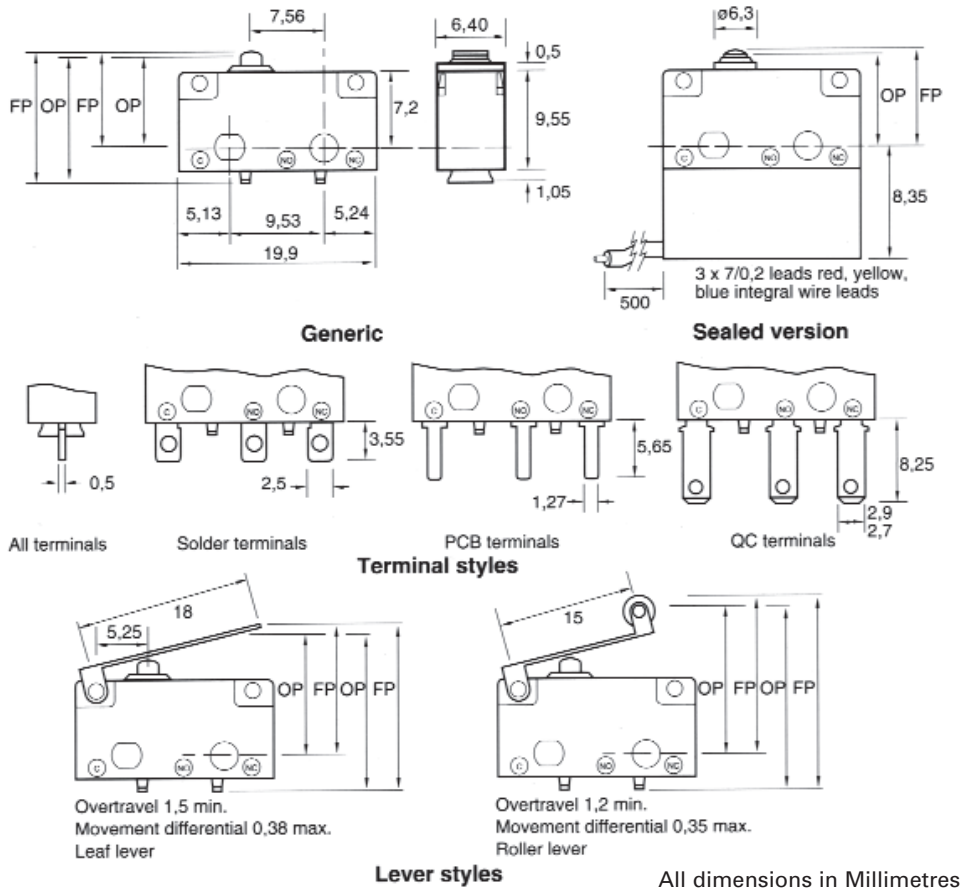
\*Note: Lever and roller lever actuator are available as options on most switches. Consult factory.

### STANDARDS / AGENCY / RATINGS:





PRODUCT DRAWINGS



MECHANICAL / ELECTRICAL CHARACTERISTICS:

- Overtravel:**  
.2mm (min) depress to case
- Movement differential:**  
.1mm reference
- Mechanical life:**  
10,000,000 operations
- Operating force:**  
2.0 N (203.9 gf) sealed  
1.5 N (153.0 gf) sealed
- Ingress protection:**  
IP67

- Temperature:**  
-40°C to +125°C  
(-40°F to +257°F)
- Body material:**  
Nylon 46
- Contacts:**  
Silver—Silver nickel alloy  
Gold—5 microns of gold on copper/nickel

- Terminals:**  
QC — Brass  
PCB — Tin plated brass  
Solder — Brass

- Electrical Rating (Silver):**  
250VAC (res.) — 5A (Max)  
250VAC (ind.) — 1A (Max)  
28VDC (res.) — 3A (Max)  
28VDC (ind.) — 1A (Max)
- Electrical Rating (Gold):**  
28VDC (res.) — 100mA (Max)

- Electrical Life (nominal):**  
100,000 operations
- Dielectric strength:**  
1000 VAC

- Insulation resistance:**  
1 G Ohm

- Contact resistance (initial):**  
20m Ω (max) gold,  
50m Ω (max) silver

- Contact bounce:**  
5 millisecond (max),  
1 millisecond per each pulse

BUTTON / LEVER POSITIONS:

Free position (F.P)

|  |                              |
|--|------------------------------|
| Standard switch to mounting holes..... | 0.360 inches / 9,14mm (max)  |
| Standard switch to PCB.....            | 0.486 inches / 12,35mm (max) |
| Sealed switch to mounting holes.....   | 0.368 inches / 9,35mm (max)  |
| Leaf lever to mounting holes.....      | 0.492 inches / 12,50mm (max) |
| Leaf lever to PCB.....                 | 0.618 inches / 15,70mm (max) |
| Roller lever to mounting holes.....    | 0.677 inches / 17,20mm (max) |
| Roller lever to PCB.....               | 0.803 inches / 20,40mm (max) |

Operating point (O.P)

|  |                                     |
|--|-------------------------------------|
| Standard switch to mounting holes..... | 0.330 inches ±.016 / 8,40mm ± 0,40  |
| Standard switch to PCB.....            | 0.457 inches ±.016 / 11,60mm ± 0,40 |
| Sealed switch to mounting holes.....   | 0.335 inches±.016 / 8,50mm ± 0,40   |
| Leaf lever to mounting holes.....      | 0.400 inches±.054 / 10,15mm ± 1,37  |
| Leaf lever to PCB.....                 | 0.527 inches ±.054 / 13,38mm ± 1,37 |
| Roller lever to mounting holes.....    | 0.610 inches ±.045 / 15,50mm ± 1,14 |
| Roller lever to PCB.....               | 0.719 inches ±.045 / 18,25mm ± 1,14 |

Designs and specifications are subject to change without notice due to product improvement.

## Series 22

### MINIATURE 10 AMP DOUBLE-POLE / SIMULTANEOUS SNAP ACTION SWITCHES

This rugged double-pole double-break Butterfly® mechanism switch can be configured for Form XX, Form YY or Form ZZ switching. This unique design is ideal for your toughest applications where reliability is a must.



ACTUAL SIZE

### APPLICATIONS

- Pressure control sensors
- Pendant controls
- Door openers for transit equipment
- Valve actuator
- Lift trucks
- Interlock kiosk

### KEY FEATURES:

- Gold or silver contacts
- UL recognized and CSA certified
- Variety of terminal styles
- Roller lever and overtravel plunger actuator are available

### ORDERING INFORMATION:

#### Switches

| Part Number   | Terminals             |
|---------------|-----------------------|
| <b>22-104</b> | End Solder            |
| <b>22-204</b> | #4 Screw              |
| <b>22-304</b> | Side Solder           |
| <b>22-504</b> | Quick Disconnect .250 |

#### Actuator (see page 71 for additional specifications)

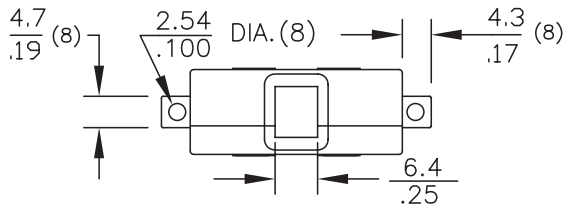
| Part Number                        | Oper. Force | Release Force | Pretravel | Overtravel | Movement Diff. | Operating Point |
|------------------------------------|-------------|---------------|-----------|------------|----------------|-----------------|
| <b>72-1160</b><br>Roller Lever (1) | 10 oz max   | 1.5 oz min    | .150 max  | .035 min   | .070 ± .015    | 1.0 ± .031      |
| <b>72-2080</b><br>Over Travel (2)  | 17 ± 5 oz   | 4 oz min      | .060 max  | .215 min   | .030 ± .007    | .828±.031       |

(1) When used with 22-104 basic switch or 22-204 basic switch  
 (2) When used with 22-304 basic switch

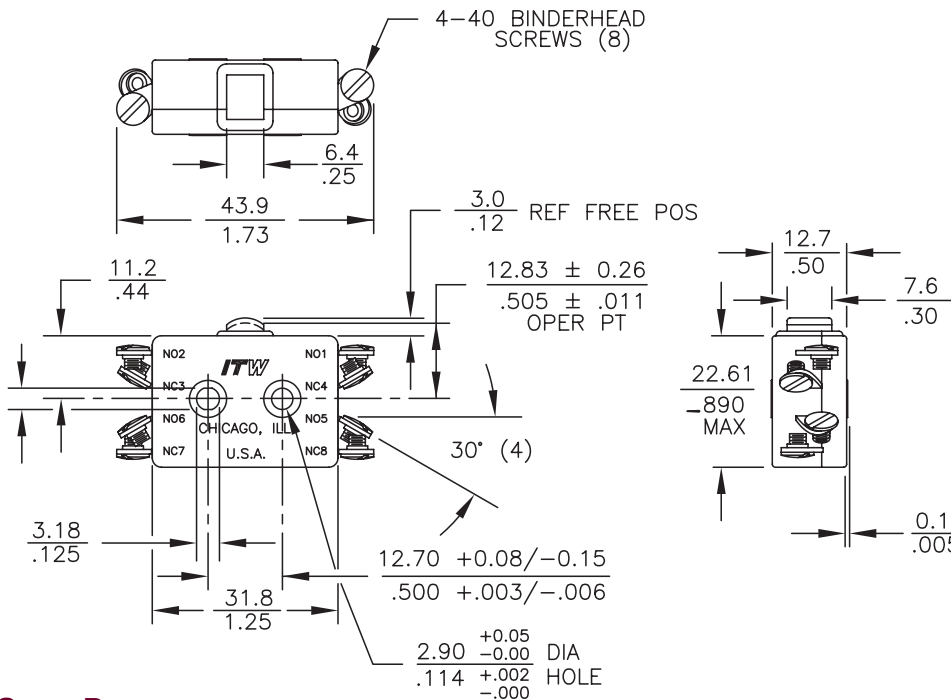
### STANDARDS / AGENCY / RATINGS:



## END SOLDER



## #4 SCREW



## MECHANICAL / ELECTRICAL CHARACTERISTICS:

**Pretravel:**  
0.060 inches max

**Overtravel:**  
0.015 inches min

**Operating Force:**  
17 ± 5 oz

**Release Force:**  
4 oz min

**Movement Differential:**  
0.030 inches ± .009

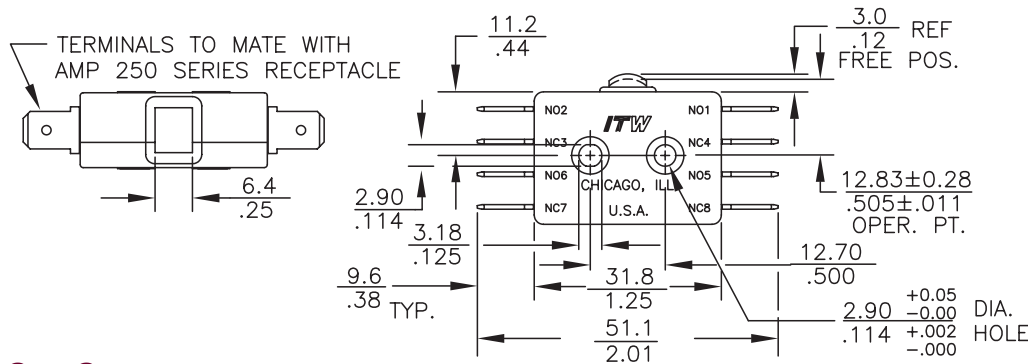
**Operating Point:**  
0.505 inches ± .011  
(from mounting hole centers)

**Circuit:**  
DPDT-DB (Form ZZ)

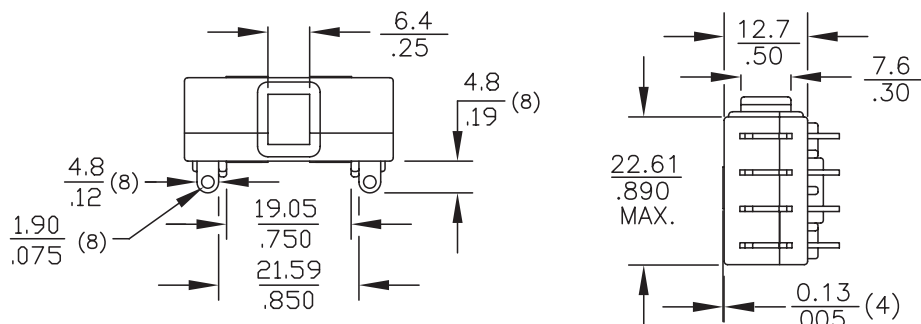
**Electrical Ratings:**

| Circuitry                        | 125/250 VAC                             | 28 VDC                   |
|----------------------------------|---|--------------------------|
| DPST-DB NO or NC (Form XX or YY) | 10 amp (75-80% PF)<br>1/2 HP<br>125 VAC | 10 amp Ind<br>15 amp Res |
| DPDT-DB (Form ZZ)                | 3/4 HP<br>250 VAC                       | 7 amp Ind<br>10 amp Res  |

## QUICK DISCONNECT



## SIDE SOLDER



## Series 26

### SUB-MINIATURE 8 AMP DOUBLE POLE SNAP ACTION SWITCHES

This unique design has a DPDT-DB (Form ZZ) contact arrangement, or can be wired externally to provide two commons to form standard DPDT (Form CC) circuitry. This switch can control up to 4 isolated circuits.



### APPLICATIONS

- Aircraft rotary actuator
- Aircraft valve actuator
- Circuit breakers
- Aircraft contractors
- Industrial machinery

### KEY FEATURES:

- Gold or silver contacts
- Meets MIL-PRF-8805/77
- End or side terminals available
- UL recognized and CSA certified: 8 amps @ 125/250 VAC
- Roller lever, lever, short roller lever and bushing mount actuator are available

ACTUAL SIZE ACTUAL SIZE

### ORDERING INFORMATION:

#### Switches

| Part Number      | Simultaneity      | Contacts    | Terminals   | RoHS Compliant |
|------------------|-------------------|-------------|-------------|----------------|
| <b>26-804</b>    | Simultaneous*     | Silver**    | End Solder  | ✓              |
| <b>26-888051</b> | Ref. M8805/77-001 | Gold Plated | End Solder  | —              |
| <b>26-904</b>    | Simultaneous*     | Silver**    | Side Solder | ✓              |
| <b>26-988051</b> | Ref. M8805/77-002 | Gold Plated | Side Solder | —              |

\* Within .004" of plunger travel.  
 \*\* For electrical loads under 250 mA, consult factory.

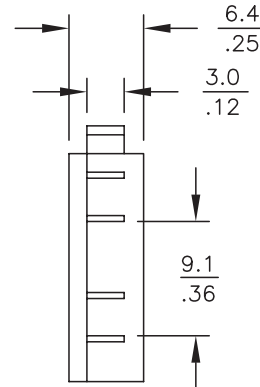
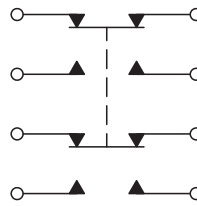
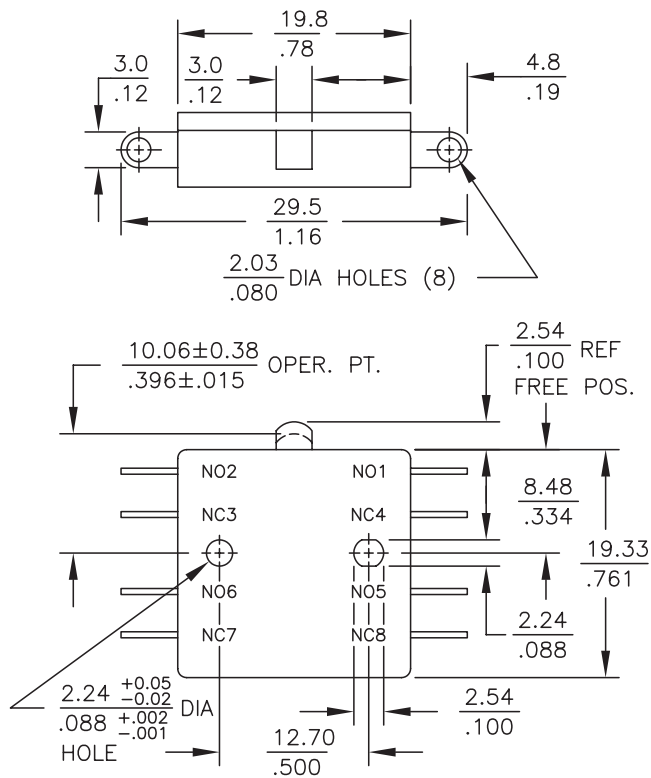
#### Actuator (see page 72 for additional specifications)

| Part Number                          | Switch Series | Oper. Force | Release Force | Pretravel | Overtravel | Movement Diff.     |
|--------------------------------------|---------------|-------------|---------------|-----------|------------|--------------------|
| <b>76-1200</b><br>Roller Lever       | 26            | 8 oz max    | 1 1/2 oz min  | .130 max  | .026 min   | .054 ± .022        |
| <b>76-1210</b><br>Lever              | 26            | 7 oz max    | 2 oz min      | .155 max  | .025 min   | .065 max           |
| <b>76-1220</b><br>Short Roller Lever | 26            | 16 oz max   | 5 oz min      | .050 max  | .012 min   | .020 ± .010 - .005 |
| <b>76-22604</b><br>Bushing Mount     | 16            | 5 oz        | —             | .050 max  | .156 min   | —                  |

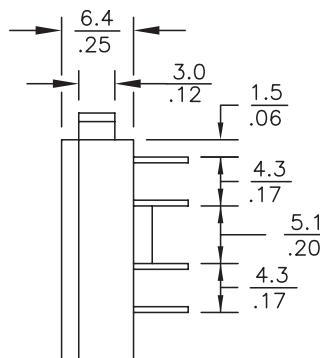
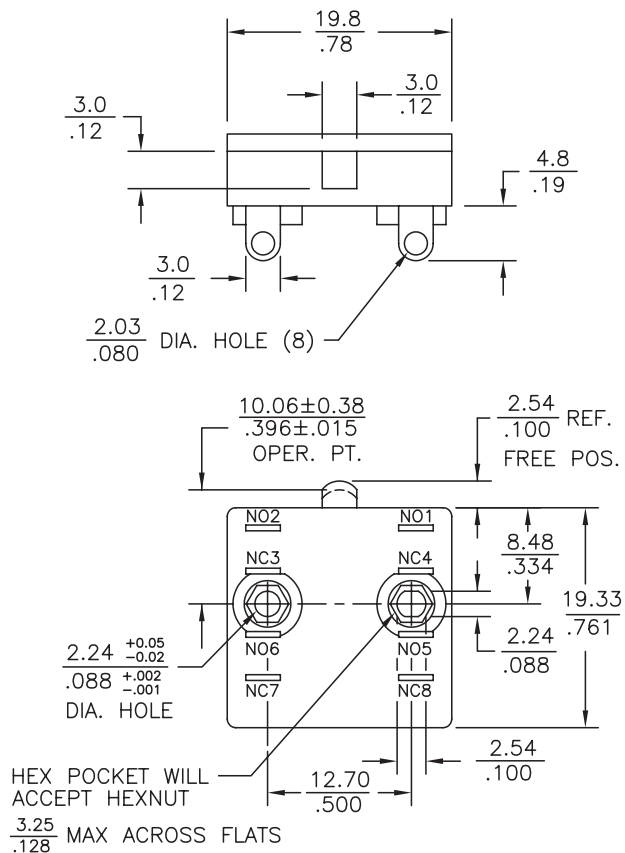
### STANDARDS / AGENCY / RATINGS:



END SOLDER



SIDE SOLDER



MECHANICAL / ELECTRICAL CHARACTERISTICS:

- Pretravel:**  
0.050 inches (Max)
- Overtravel:**  
0.012 inches (Min)
- Operating Force:**  
12 ± 4 oz
- Release Force:**  
5 oz (Min)
- Movement Differential:**  
0.020 inches ± .010 / .005
- Operating Point:**  
0.396 inches ± .015  
(from mounting hole centers)
- Circuit:**  
DPDT-DB (Form ZZ)
- Temperature Index:**  
To 275°F Ambient
- MIL-PRF-8805/7 QPL listed:**  
26-888051 M8805/77-001  
26-988051 M8805/77-002

Electrical Ratings:

| Circuitry            | Current          | Voltage                         |
|----------------------|------------------|---------------------------------|
| DPDT-DB<br>(Form ZZ) | 8 Amps<br>5 Amps | 125/250 VAC 75-80% PF<br>28 VDC |



## Series KAP 26

### SUB-MINIATURE 8 AMP DOUBLE POLE/SIMULTANEOUS SNAP ACTION SWITCHES

Similar to Series 26 with improved materials and performance. Ideal for critical applications where long life and reliability are needed.



#### APPLICATIONS

- Aircraft rotary actuators
- Aircraft valve actuators
- Circuit breakers
- Aircraft contractors
- Industrial machinery
- Medical equipment

#### KEY FEATURES:

- Enhanced gold contacts for high or low power applications
- Thermoplastic case sealed to prevent flux intrusion
- Meets MIL-PRF-8805/77
- End or side terminals available
- Roller lever, lever, short roller lever and bushing mount actuators are available

ACTUAL SIZE

#### ORDERING INFORMATION:

##### Switches

| Part Number   | Simultaneity  | Contacts      | Terminals  |
|---------------|---------------|---------------|------------|
| <b>26-810</b> | Simultaneous* | Enhanced Gold | End Solder |

\* Within .002" of plunger travel.

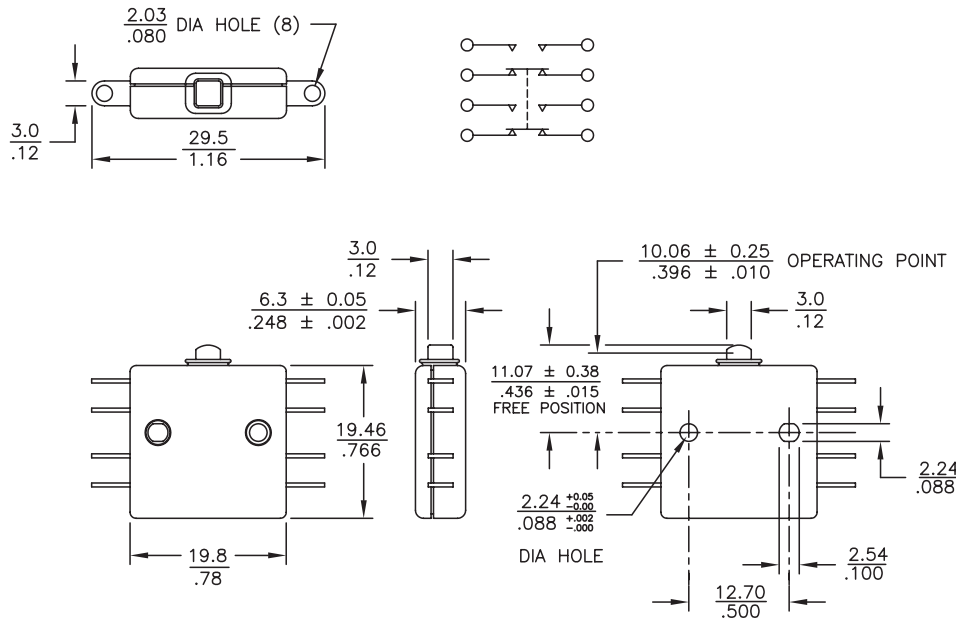
##### Actuator (see page 72 for additional specifications)

| Part Number                          | Switch Series | Oper. Force | Release Force | Pretravel | Overtravel | Movement Diff.     |
|--------------------------------------|---------------|-------------|---------------|-----------|------------|--------------------|
| <b>76-1200</b><br>Roller Lever       | 26            | 8 oz max    | 1 1/2 oz min  | .130 max  | .026 min   | .054 ± .022        |
| <b>76-1210</b><br>Lever              | 26            | 7 oz max    | 2 oz min      | .155 max  | .025 min   | .065 max           |
| <b>76-1220</b><br>Short Roller Lever | 26            | 16 oz max   | 5 oz min      | .050 max  | .012 min   | .020 ± .010 - .005 |

#### STANDARDS / AGENCY / RATINGS:



END TERMINATION



MECHANICAL / ELECTRICAL CHARACTERISTICS:

- Pretravel:** 0.060 inches (Max)
- Overtravel:** 0.020 inches (Min)
- Operating Force:** 18 ± 5 oz
- Release Force:** 5 oz (Min)
- Movement Differential:** 0.025 inches ± .010
- Operating Point:** 0.396 inches ± .010 (from mounting hole centers)
- Circuit:** DPDT-DB (Form ZZ)
- Temperature Index:** -85°F to +275°F Ambient
- MIL-PRF-8805 QPL Listed:** 26-810 M8805/77-003
- Electrical Ratings:** See chart to the left

Electrical rating, 26-810:

| Load             | Sea Level      |                 |                          |                           | 70,000 Ft.     |                 |
|------------------|----------------|-----------------|--------------------------|---------------------------|----------------|-----------------|
|                  | 28 VDC<br>DPDT | 28 VDC<br>4 CKT | 115 VAC<br>60 HZ<br>DPDT | 115 VAC<br>60 HZ<br>4 CKT | 28 VDC<br>DPDT | 28 VDC<br>4 CKT |
| <b>Resistive</b> | 8 amp          | 8 amp           | 6 amp                    | 4 amp                     | 8 amp          | 8 amp           |
| <b>Inductive</b> | 6 amp          | 4 amp           | 4 amp                    | 4 amp                     | 2 amp          | 1 amp           |
| <b>Lamp</b>      | 0.5 amp        | 0.5 amp         | 2 amp                    | 1 amp                     | —              | —               |

## Series 65

### SEALED 10 AMP SUB-MINIATURE SWITCHES

These rugged metal enclosed sealed switches use the Butterfly® switch mechanism providing long-life, durability and reliability. These switches are ideal for demanding military and industrial applications.

### APPLICATIONS

- Aircraft valves
- Wheelchair lifts
- Machine tools
- Missiles and missile launchers
- Heavy industrial equipment

### KEY FEATURES:

- Meets the (watertight) requirements per MIL-PRF-8805 enclosure design symbol 3
- Gold contacts
- Variety of actuators available
- Solder terminals standard or wire leads available
- Temperature rating: -55°C to +85°C (-65°F to +185°F)
- MIL-PRF-8805 QPL listed switches available



ACTUAL SIZE

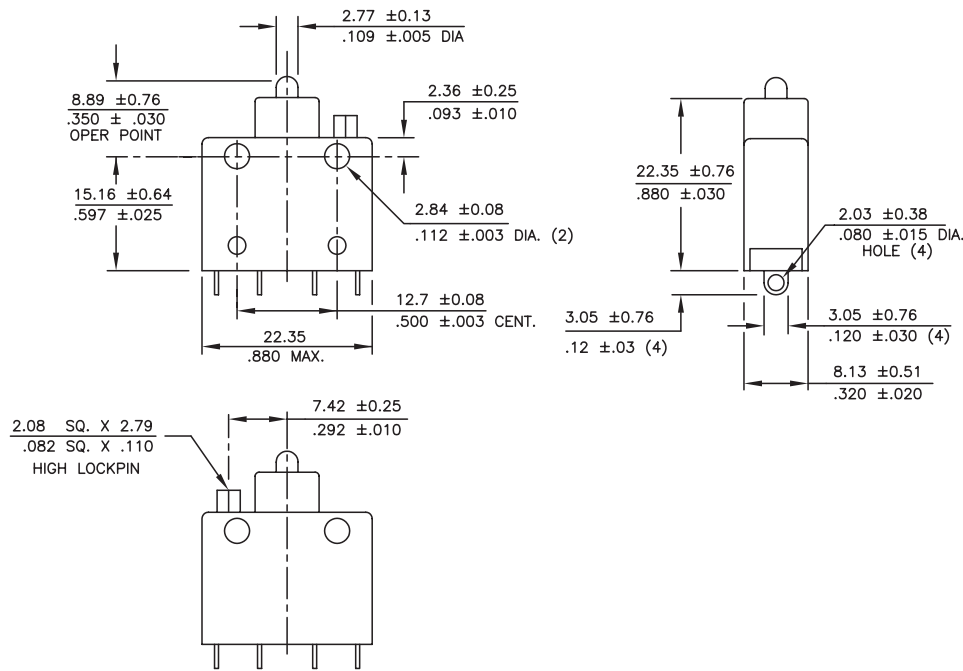
### ORDERING INFORMATION:

| Part Number | Actuator     | P.T.     | O.T.     | O.F.      | R.F.     | M.D.      |
|-------------|--------------|----------|----------|-----------|----------|-----------|
| 65-201000   | Pin plunger  | .050 max | .012 min | 24 ± 8 oz | 8 oz min | .010-.030 |
| 65-301000   | Roller lever | .115 max | .025 min | 16 oz max | 5 oz min | .058 max  |
| 65-401000   | Over travel  | .070 max | .187 min | 36 oz max | 8 oz min | .010-.030 |

### STANDARDS / AGENCY / RATINGS:



## PIN PLUNGER



## MECHANICAL / ELECTRICAL CHARACTERISTICS:

### Circuit:

SPDT-DB (Form Z)

### Temperature range:

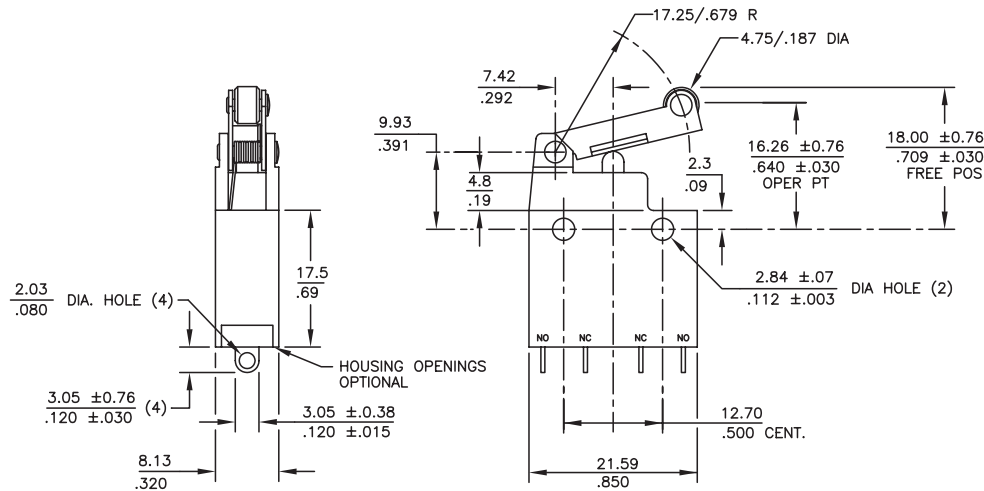
-55°C to +85°C

(-65°F to +185°F)

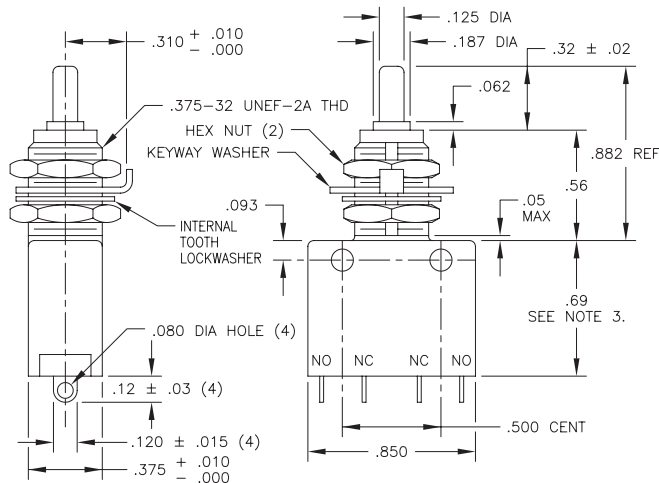
### Electrical Ratings (Typical):

| Circuitry        | 125/250 VAC | 28 VDC   |
|------------------|-------------|----------|
| SPDT-DB (Form Z) | 10 A        | 5 A Ind. |

## ROLLER LEVER



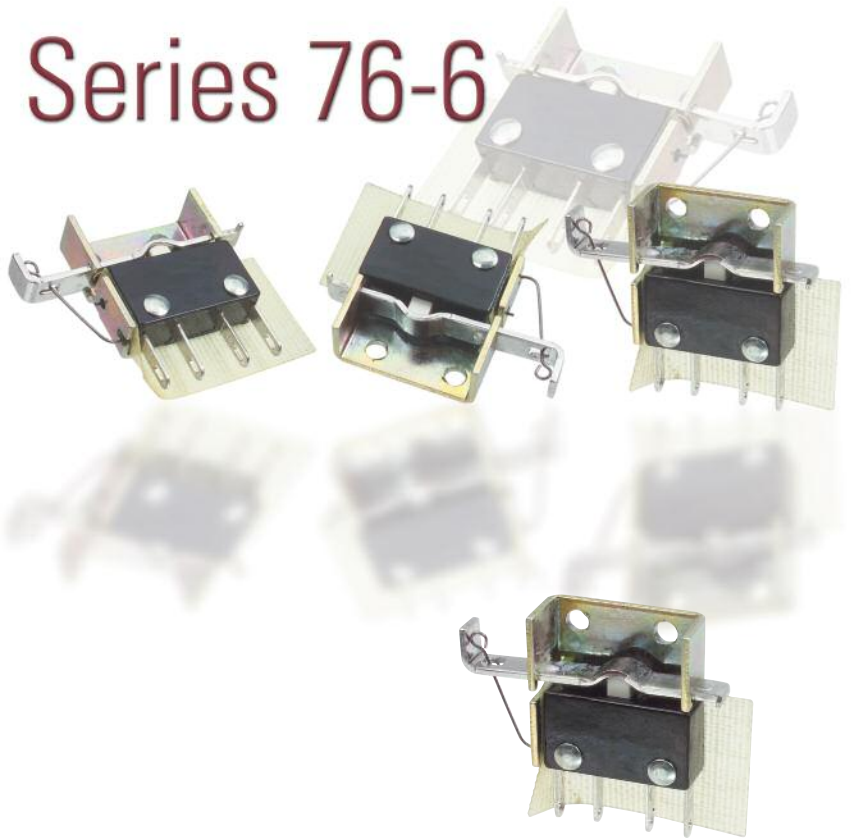
## OVER TRAVEL



## Series 76-6

### DOOR INTERLOCK SWITCHES FOR CABINET, SERVICE DOOR SAFETY

Door interlocks use 10 amp Butterfly® switch mechanisms to provide long life and reliability.



ACTUAL SIZE

### APPLICATIONS

- Computer door interlocks
- Audio-Visual equipment
- Oil exploration equipment
- Seismographic sending
- Process control enclosures
- Remote enclosure for telephone switches

### KEY FEATURES:

- Protection for testing and servicing electronic equipment
- Automatic interruption of power
- Manual set allows continuation of power for testing
- Restores power with closing of door or drawer
- UL recognized

### ORDERING INFORMATION:

| Part Number    | CIRCUIT       | 125/250 VAC | 28 VDC IND | TERMINALS              |
|----------------|---------------|-------------|------------|------------------------|
| <b>76-6005</b> | SPDT (Form Z) | 5A *        | 3A         | Bottom Solder/ .110 QC |

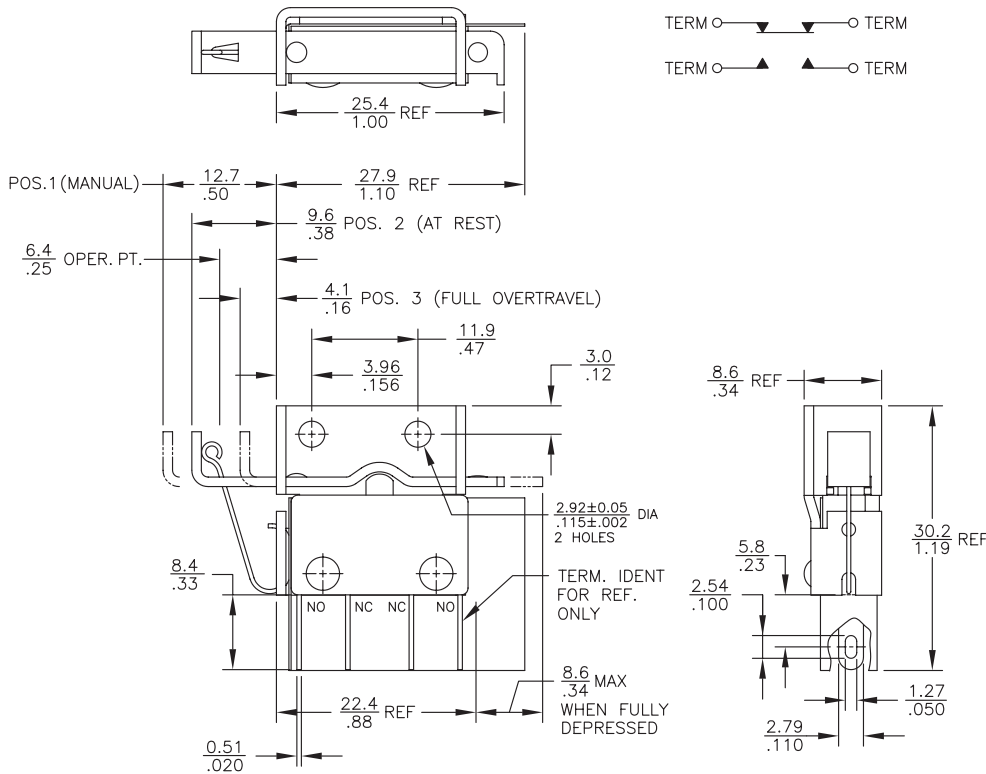
\* 75-80% Power Factor  
\*\* Contact Factory for Minimums

### STANDARDS / AGENCY / RATINGS:





## PRODUCT DRAWINGS



## MECHANICAL / ELECTRICAL CHARACTERISTICS:

**Circuit:**  
SPDT-DB

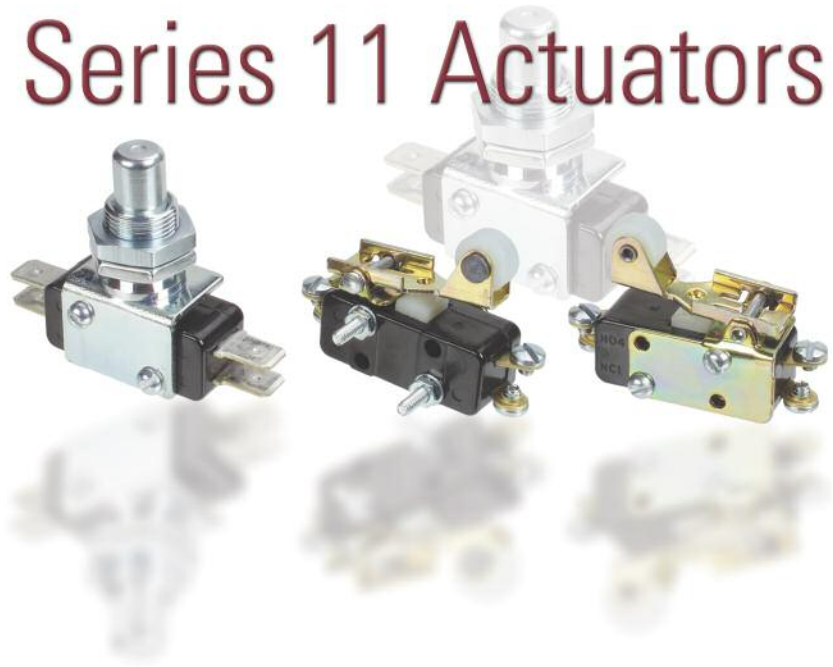
### Electrical Ratings:

| Circuitry   | Current | Voltage       |
|-------------|---------|---------------|
| Form X or Y | 10 Amps | 125/250 VAC * |
|             | 10 Amps | 28 VDC IND    |
| Form Z      | 5 Amps  | 125/250 VAC   |
|             | 3 Amps  | 28 VDC IND    |

\* UL and CSA Listed 75% PF

SEE PAGE 46  
FOR SWITCHES

# Series 11 Actuators



## KEY FEATURES:

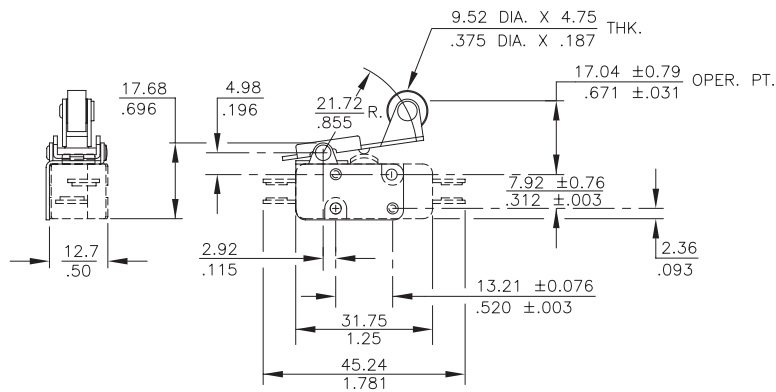
- Roller Lever
- Overtravel

## MECHANICAL CHARACTERISTICS\*:

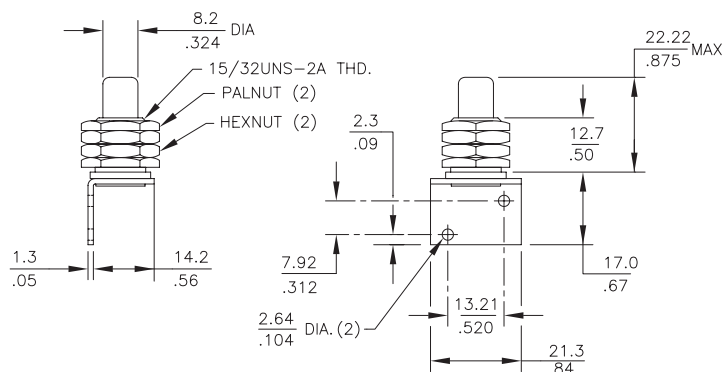
| Part Number                          | Oper. Force | Release Force | Pretravel | Overtravel | Movement Diff. | Operating Point |
|--------------------------------------|-------------|---------------|-----------|------------|----------------|-----------------|
| <b>71-1040</b><br>Roller Lever       | 3.5 oz max  | 2 oz min      | .093 max  | .062 min   | .030 ± .015    | .671 ± .031     |
| <b>71-2010</b><br>Overtravel Plunger | 8 ± .3 oz   | 4 oz min      | .050 max  | .215 min   | .020 ± .005    | .828 ± .015     |

\*Mechanical characteristics when used with Basic Switch 11-104.

## 71-1040



## 71-2010



# Series 16 Actuators

SEE PAGES 50 & 52  
FOR SWITCHES



**KEY FEATURES:**

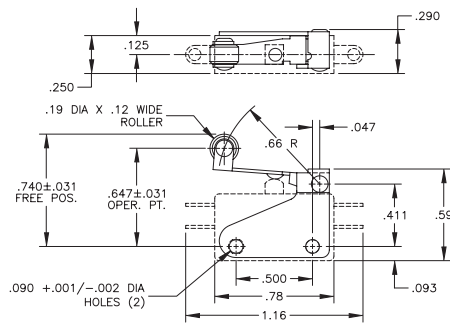
- Roller Lever
- Short Roller Lever
- Lever
- Bushing Mount

**MECHANICAL CHARACTERISTICS:**

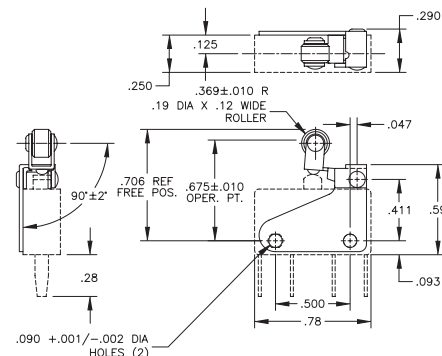
| Part Number                          | Switch Series | Oper. Force         | Release Force | Pretravel | Overtravel | Movement Diff. |
|--------------------------------------|---------------|---------------------|---------------|-----------|------------|----------------|
| <b>76-1200</b><br>Roller Lever       | 16            | 4 oz max            | 1 oz min      | .125 max  | .025 min   | .045 ± .011    |
| <b>76-1210</b><br>Lever              | 16            | 2.5 oz max          | 1 oz min      | .125 max  | .025 min   | .047 ± .013    |
| <b>76-1220</b><br>Short Roller Lever | 16            | 5 + 3 oz - 2 oz min | 2 oz min      | .050 max  | .023 min   | .020 ± .005    |
| <b>76-22604</b><br>Bushing Mount     | 16            | 5 oz                | —             | .050 max  | .156 min   | —              |

Notes: (1) Characteristics may vary depending on type of basic switch used in assembly. (2) All actuators supplied with mounting hardware.

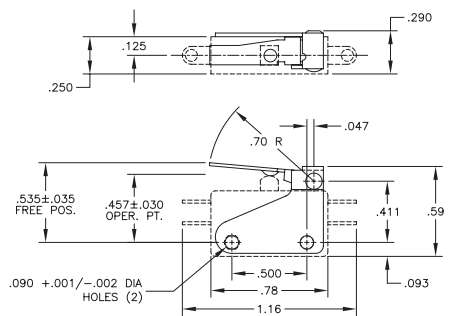
**76-1200**



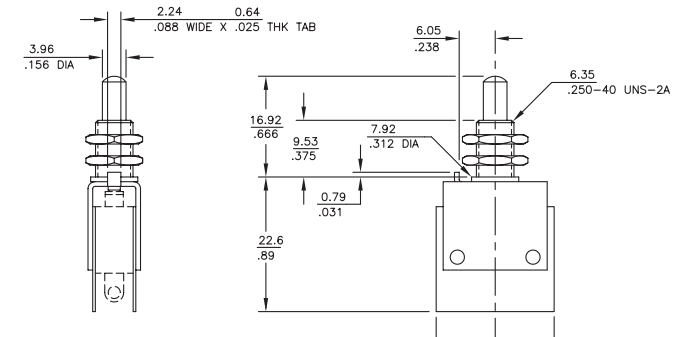
**76-1220**



**76-1210**



**76-22604**



SEE PAGE 54  
FOR SWITCHES

# Series 18 Actuators



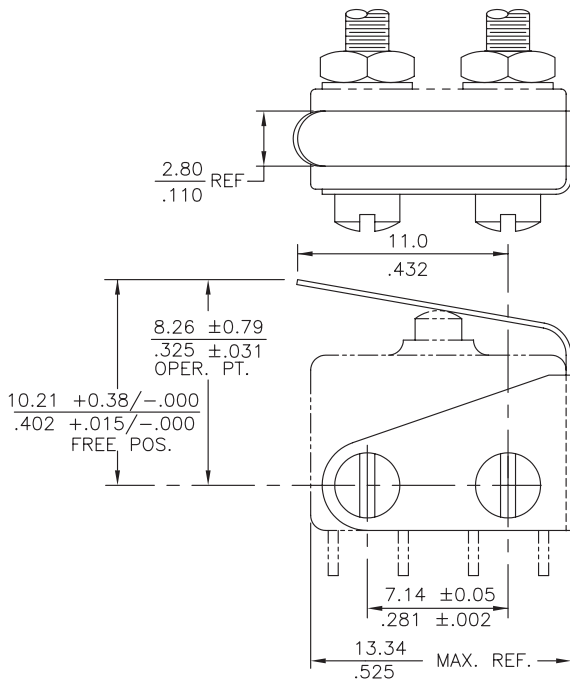
## KEY FEATURES:

- Spring Lever
- Roller Lever

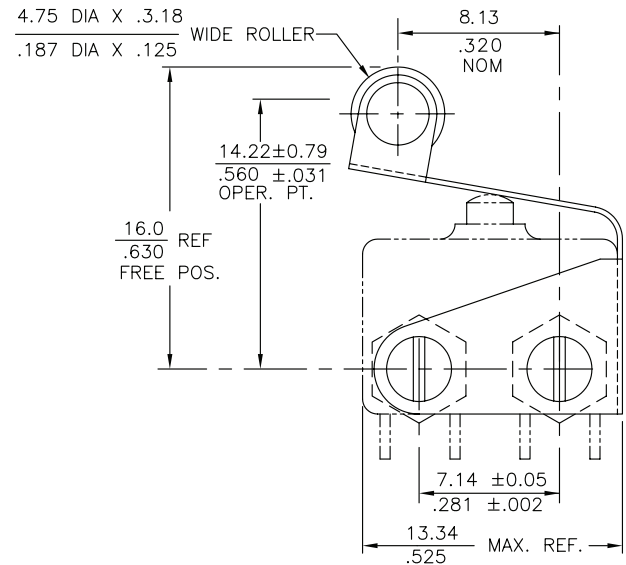
## MECHANICAL CHARACTERISTICS:

| Part Number                    | Oper. Force | Release Force | Pretravel | Overtravel | Movement Diff. | Operating Point |
|--------------------------------|-------------|---------------|-----------|------------|----------------|-----------------|
| <b>78-3000</b><br>Spring Lever | 6 ± 2 oz    | 2 oz min      | .125 max  | .030 min   | .030 ± .015    | .325 ± .030     |
| <b>78-3100</b><br>Roller Lever | 6 ± 2 oz    | 2 oz min      | .125 max  | .030 min   | .035 ± .015    | .560 ± .030     |

## 78-3000



## 78-3100



# Series 22 Actuators

SEE PAGE 58  
FOR SWITCHES



**KEY FEATURES:**

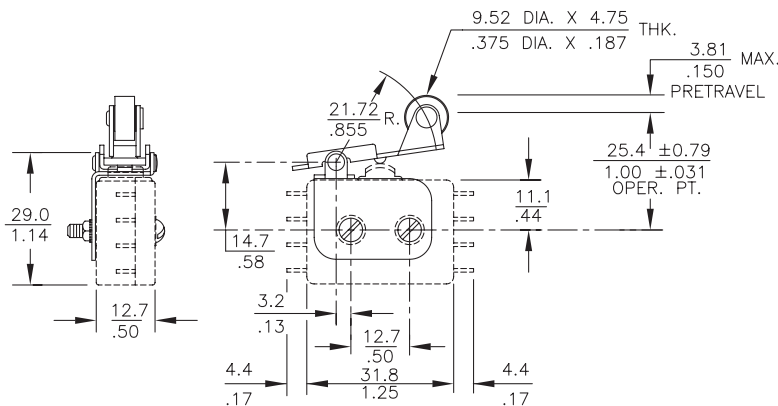
- Roller Lever
- Overtravel

**MECHANICAL CHARACTERISTICS:**

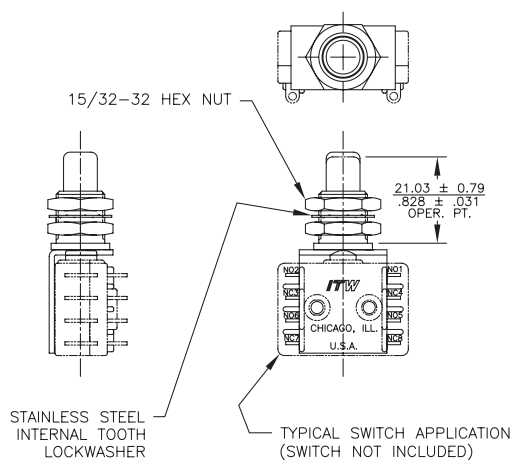
| Part Number                        | Oper. Force | Release Force | Pretravel | Overtravel | Movement Diff. | Operating Point |
|------------------------------------|-------------|---------------|-----------|------------|----------------|-----------------|
| <b>72-1160</b><br>Roller Lever (1) | 10 oz max   | 1.5 oz min    | .150 max  | .035 min   | .070 ± .015    | 1.0 ± .031      |
| <b>72-2080</b><br>over travel (2)  | 17 ± 5 oz   | 4 oz min      | .060 max  | .215 min   | .030 ± .007    | .828 ± .031     |

(1) When used with 22-104 basic switch or 22-204 basic switch. (2) When used with 22-304 basic switch

**72-1160**



**72-2080**





SEE PAGE 60 & 62  
FOR SWITCHES

# Series 26 Actuators



## KEY FEATURES:

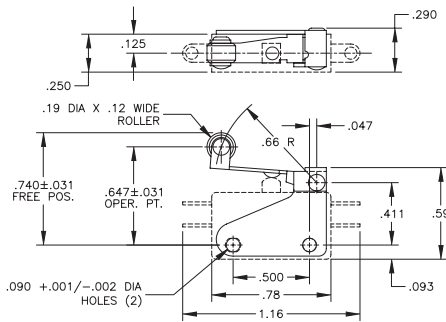
- Roller Lever
- Short Roller Lever
- Lever
- Bushing Mount

## MECHANICAL CHARACTERISTICS:

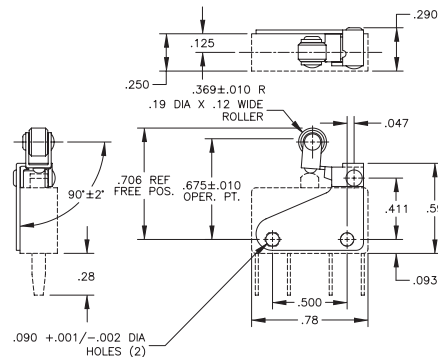
| Part Number                          | Switch Series | Oper. Force | Release Force | Pretravel | Overtravel | Movement Diff. |
|--------------------------------------|---------------|-------------|---------------|-----------|------------|----------------|
| <b>76-1200</b><br>Roller Lever       | 26            | 8 oz max    | 1.5 oz min    | .130 max  | .026 min   | .054 ± .022    |
| <b>76-1210</b><br>Lever              | 26            | 7 oz max    | 2 oz min      | .155 max  | .025 min   | .065 max       |
| <b>76-1220</b><br>Short Roller Lever | 26            | 16 oz max   | 5 oz min      | .050 max  | .012 min   | .010 ± .005    |
| <b>76-22604</b><br>Bushing Mount     | 16            | 5 oz        | —             | .050 max  | .156 min   | —              |

Notes: (1) Characteristics may vary depending on type of basic switch used in assembly. (2) All actuators supplied with mounting hardware.

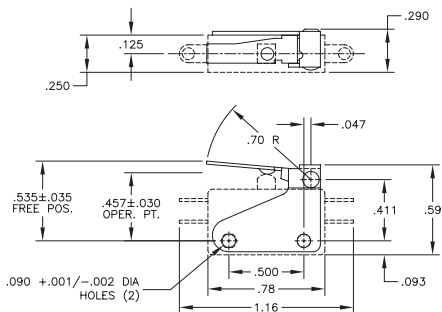
### 76-1200



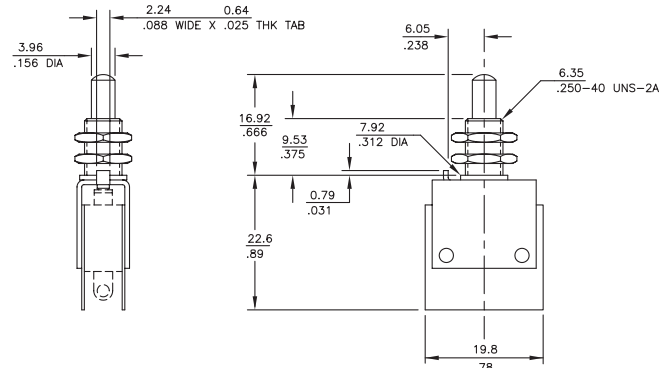
### 76-1220



### 76-1210



### 76-22604





## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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