








# Product Catalog

Design, development and manufacture of switch solutions

-  **PUSH BUTTON**
-  **SNAP ACTION**
-  **ACTUATORS**
-  **SLIDE**
-  **ROTARY**
-  **CUSTOM ASSEMBLIES**
-  **MILITARY / AEROSPACE**



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



[WWW.ITWSWITCHES.COM](http://WWW.ITWSWITCHES.COM)

800.544.3354

# ITW Switches

2550 Millbrook Drive, Buffalo Grove, IL 60089  
800.544.3354 • 847.876.9400 • 847.876.9440 (Fax)  
[www.itwswitches.com](http://www.itwswitches.com)

**Smithers Quality Assessments, Inc.**  
CERTIFICATE OF APPROVAL  
This is to Certify that the Quality Management System of:


**ITW SWITCHES**  
2550 Millbrook Drive  
Buffalo Grove, Illinois 60089


has been assessed and approved in accordance with the requirements AS9104A by Smithers Quality Assessments, an accredited Aerospace Registration Management Program Certification Body, to the following quality management system standards and requirements:

**AS9100 Revision B**

The Quality Management System is Applicable to:  
Design and Manufacture of engineered switches, sensors and assemblies.


Approval Certificate Number: 11.067.2  
Original Approval: March 8, 2011\*  
Current Certificate: March 8, 2011  
Certificate Expires: July 1, 2014

  
The use of the accreditation mark indicates accreditation in respect of those activities covered by The Accreditation Certificate Number 11.067.2

  
on behalf of SQA - J. Michael Hochschwender, President

The approval is subject to the company maintaining its system to the required standards which Smithers Quality Assessments, Inc., 425 W. Market St., Akron, Ohio 44303

\*Originally certified July 10, 1997, by another accredited registrar



Form SQA 13.0a AS9100 Revise: 01/21/11  
14005 (1/2010) - Single Side  
Current Certificate Revision Date: March 8, 2011

**Smithers Quality Assessments, Inc.**  
CERTIFICATE OF APPROVAL  
This is to Certify that the Quality Management System of:

**ITW SWITCHES**  
2550 Millbrook Drive  
Buffalo Grove, Illinois 60089

has been assessed and approved by Smithers Quality Assessments, Inc., to the following quality management system standards and requirements:

**ISO 9001:2008 with Design**

The Quality Management System is Applicable to:  
Design and Manufacture of engineered switches, sensors and assemblies.

Approval Certificate Number: 11.067.3  
Original Approval: March 8, 2011\*  
Current Certificate: March 8, 2011  
Certificate Expires: March 7, 2014

  
The use of the accreditation mark indicates accreditation in respect of those activities covered by The Accreditation Certificate Number 11.067.3

  
on behalf of SQA - J. Michael Hochschwender, President

The approval is subject to the company maintaining its system to the required standards which will be monitored by Smithers Quality Assessments, Inc., 425 W. Market St., Akron, Ohio 44303-2059

\*Originally certified July 10, 1997, by another accredited registrar



Form SQA 13.1a ISO 14005 (1/2010) - Single Side  
Revise: 01/21/11  
Current Certificate Revision Date: March 8, 2011

## INTERNATIONAL LOCATIONS

### ITW Electronic Business Asia Co., Limited

Box 26140  
A4-32 Kaohsiung Export Processing Zone  
Kaohsiung, Taiwan  
Republic of China  
886 (7) 811-9206 (Phone)  
886 (7) 811-1795 (Fax)  
[www.itwasia.com.tw](http://www.itwasia.com.tw)

### ITW Switches and Switch Panels

Norway Road  
Hilsea, Portsmouth, England PO3 5HT  
44 (0) 23 92 694971 (Phone)  
44 (0) 23 92 666352 (Fax)  
[www.itwswitches.co.uk](http://www.itwswitches.co.uk)



<b>Table Of Contents</b> .....	<b>ii – iii</b>
<b>About ITW Switches</b> .....	<b>iv</b>
<b>Switch Characteristics</b> .....	<b>v</b>
<b>Switch Circuitry</b> .....	<b>v</b>
<b>Pushbutton Switches</b> .....	<b>2 – 43</b>
<b>Series 034: Sub-Miniature T-05 Space Saver</b> .....	<b>2 – 3</b>
<b>Series 39: 0.25 amp Miniature LED Lighted</b> .....	<b>4 – 5</b>
<b>Series 39-4 and 39-5 Mr. Clean®</b> .....	<b>6 – 7</b>
<b>Series 39-8: Surface Mount Miniature</b> .....	<b>8 – 9</b>
<b>Series 47: Low Cost Sealed Switch</b> .....	<b>10 – 11</b>
<b>Series 48: Electro-Mechanical Miniature Sealed</b> .....	<b>12 – 13</b>
<b>Series 48: Miniature Hall-Effect Sealed</b> .....	<b>14 – 15</b>
<b>Series 48M-EM: Panel Sealed Metal Electro-Mechanical Pushbutton</b> .....	<b>16 – 17</b>
<b>Series 48M-SS: Panel Sealed Metal Solid-State (Hall-Effect) Pushbutton</b> .....	<b>18 – 19</b>
<b>Series 49: Miniature Sealed ESD Resistant</b> .....	<b>20 – 21</b>
<b>Series 49-59: Fully Sealed with Wire Leads</b> .....	<b>22 – 23</b>
<b>Series 49-59: Panel Sealed with Terminals</b> .....	<b>24 – 25</b>
<b>Series 57: Vandal Resistant Miniature Sealed</b> .....	<b>26 – 27</b>
<b>Series 57M-EM: Miniature Panel Sealed Metal Electro-Mechanical Pushbutton</b> .....	<b>28 – 29</b>
<b>Series 57M-SS: Miniature Panel Sealed Metal Solid-State (Hall-Effect) Pushbutton</b> .....	<b>30 – 31</b>
<b>Series 58M-EM: Fully Sealed Metal Electro-Mechanical Pushbutton</b> .....	<b>32 – 33</b>
<b>Series 58M-SS: Fully Sealed Metal Solid-State (Hall-Effect) Pushbutton</b> .....	<b>34 – 35</b>
<b>Series 59: Miniature Panel Sealed Metal</b> .....	<b>36 – 37</b>
<b>Series 76-59: Extra Tough Sealed</b> .....	<b>38 – 39</b>
<b>Series 76-95: 10 amp Vandal Resistant</b> .....	<b>40 – 41</b>
<b>Series 76-97: Panel Sealed Switch</b> .....	<b>42 – 43</b>

<b>Snap Action Switches</b> .....	<b>46 – 67</b>
<b>Series 11: Miniature 10 amp Double-Break</b> .....	<b>46 – 47</b>
<b>Series 14: Heavy Duty 20 amp Double-Break</b> .....	<b>48 – 49</b>
<b>Series 16: Sub-Miniature 10.1 amp Double-Break</b> .....	<b>50 – 51</b>
<b>Series KAP 16: Sub-Miniature 10.1 amp Double-Break</b> .....	<b>52 – 53</b>
<b>Series 18: Ultra Sub-Miniature 7 amp Double-Break</b> .....	<b>54 – 55</b>
<b>Series 19: 5-amp Sub-Miniature</b> .....	<b>56 – 57</b>
<b>Series 22: Miniature 10 amp Double-Pole</b> .....	<b>58 – 59</b>
<b>Series 26: Sub-Miniature 8 amp Double Pole</b> .....	<b>60 – 61</b>
<b>Series KAP 26: Sub-Miniature 8 amp</b> .....	<b>62 – 63</b>
<b>Series 65: Sealed 10 amp Sub-Miniature</b> .....	<b>64 – 65</b>
<b>Series 76-6: Door Interlock Switch</b> .....	<b>66 – 67</b>
<b>Actuators Series 11 (See Page 46 for Switches)</b> .....	<b>68</b>
<b>Actuators Series 16 (See Pages 50 &amp; 52 for Switches</b> .....	<b>69</b>
<b>Actuators Series 18 (See Page 54 for Switches)</b> .....	<b>70</b>
<b>Actuators Series 22 (See Page 58 for Switches)</b> .....	<b>71</b>
<b>Actuators Series 26 (See Page 60 &amp; 62 for Switches)</b> .....	<b>72</b>
<b>Slide Switches</b> .....	<b>74 – 77</b>
<b>Series 23: Mini Mike™ Miniature</b> .....	<b>74 – 75</b>
<b>Series SE1022: Double Pole Line Voltage Selector</b> .....	<b>76 – 77</b>
<b>Rotary Switches</b> .....	<b>78 – 79</b>
<b>Series 030: Sub-Miniature T-05 Space Saver</b> .....	<b>78 – 79</b>
<b>Custom Switches and Sensors</b> .....	<b>80 – 81</b>
<b>Military Approved and QPL Switches (Cage Code 04426)</b> .....	<b>82 – 83</b>
<b>Cross Reference (Part Number to Page)</b> .....	<b>84 – 85</b>

ITW Switches is a division of Illinois Tool Works (ITW), a diverse manufacturing corporation with more than 850 operating divisions worldwide. Our value proposition, combined with our global reach, broad product offerings, innovative technologies and financial stability make ITW Switches an ideal choice among manufacturers today.

## EXPERIENCE

ITW Switches has manufactured electronic and electro-mechanical switches, sensors and assemblies for over 54 years. Founded as the Licon division of ITW in 1954, we also offer the strengths of Chicago Switch, UID, and RCL switches. Providing customized solutions to demanding customer requirements is our forte. Some of the markets served: Military / Aerospace, Transportation, Heavy Transport and Industrial Controls.

## ENGINEERING EXCELLENCE

ITW's experienced engineers have modern tools at their disposal, including 3-D Modeling, and Rapid Prototype capabilities. We have a UL-Approved Test Facility on site. Additional R&D expertise is provided by The ITW Technology Center. The Technology Center is well versed in the latest scientific and technological advancements in engineering, materials, and the physical sciences. Our salespeople are market focused. Along with our engineers, they work closely with customers to develop cost-effective, reliable solutions for the most demanding applications.

## PRODUCT AVAILABILITY

ITW Switches supports customers directly, and through a network of stocking distributors in North America. Call us, or check our website [www.itwswitches.com](http://www.itwswitches.com) for a list of our distributors, and product availability.

## QUALITY RECOGNITION

ITW Switches is ISO9001:2000 registered for our manufacturing and engineering locations in:

**Buffalo Grove, Illinois**

**Portsmouth, England**

**Kaohsiung, Taiwan**

**Shanghai, China**

Each manufacturing location maintains capability and responsibility for appropriate regulatory approval from UL, CSA, and VDE.

For ITW's corporate profile, visit [www.itwinc.com](http://www.itwinc.com)

Visit our website at [www.itwswitches.com](http://www.itwswitches.com) or email us at [customer\\_service@itwswitches.com](mailto:customer_service@itwswitches.com)



*Buffalo Grove, Illinois*

## EXTENDED WARRANTY

ITW Switches standard product warranty is 36 months. We are confident enough in our engineering and manufacturing to offer this level of product warranty.

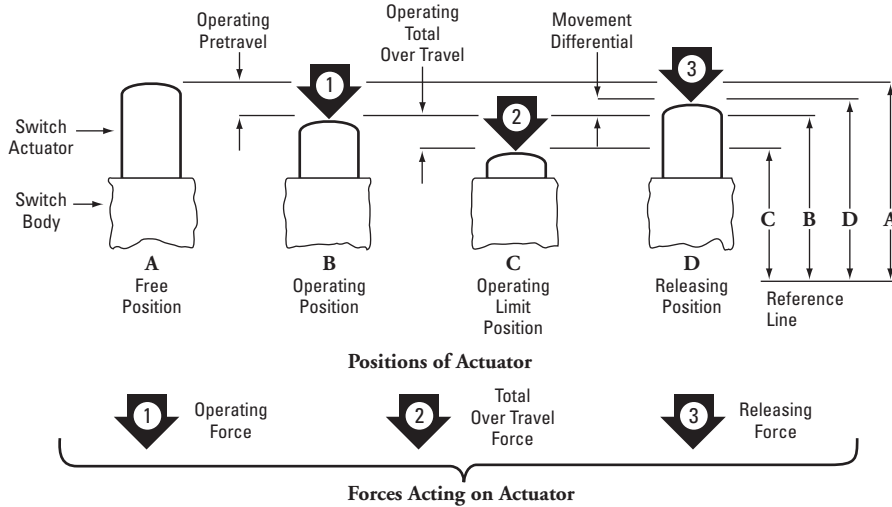
## COST CONTAINMENT

ITW Switches continuously monitors and improves the production processes and product engineering to reduce costs. We strive to deliver value in everything we do.

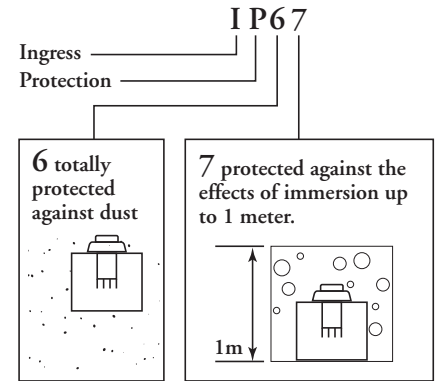
## FINANCIAL STABILITY

Our parent corporation, Illinois Tool Works, (NYSE listed, ITW) has a documented record of growth and financial stability. Revenues in 2008 were over \$13.8 billion.

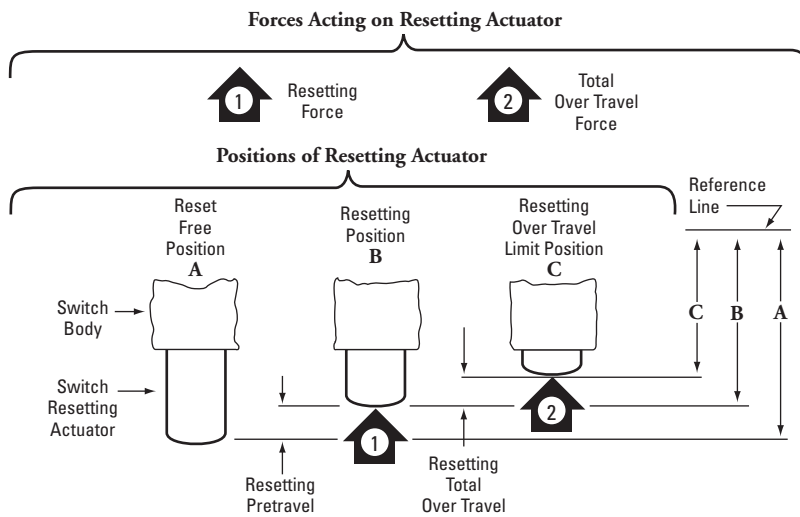
## MOMENTARY CONTACT SWITCH



## INGRESS PROTECTION



## MAINTAINED CONTACT SWITCH (RESET ACTUATOR)



## RoHS AND WEEE COMPLIANT

Most ITW Switches products meet RoHS and WEEE requirements. Please consult the website for the latest product listing.

## SWITCH CIRCUITRY

<b>Form A SPST-NO</b>	<b>Form B SPST-NC</b>	<b>Form C SPDT</b>	<b>Form AA DPST-NO</b>
<b>Form BB DPST-NC</b>	<b>Form CC DPDT</b>	<b>Form X SPST-NO-DB</b>	<b>Form Y SPST-NC-DB</b>
<b>Form Z SPDT-DB</b>	<b>Form XX DPST-NO-DB</b>	<b>Form YY DPST-NC-DB</b>	<b>Form ZZ DPDT-DB</b>

# ITW Switches

2550 Millbrook Drive, Buffalo Grove, IL 60089  
800.544.3354 • 847.876.9400 • 847.876.9440 (Fax)  
[www.itwswitches.com](http://www.itwswitches.com)



## INTERNATIONAL LOCATIONS

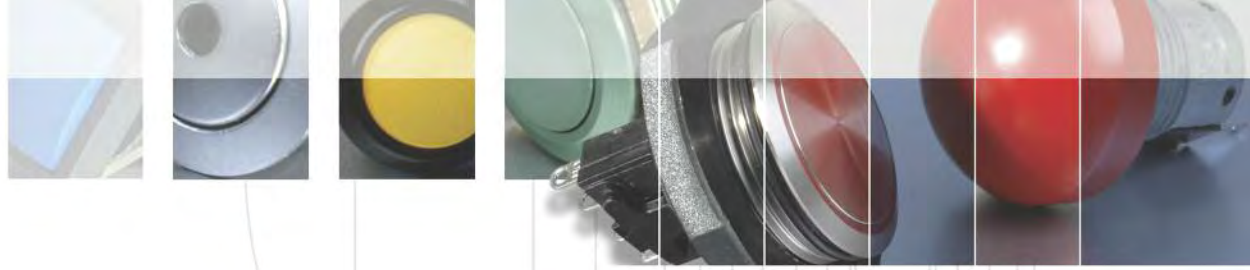
### ITW Electronic Business Asia Co., Limited

Box 26140  
A4-32 Kaohsiung Export Processing Zone  
Kaohsiung, Taiwan  
Republic of China  
886 (7) 811-9206 (Phone)  
886 (7) 811-1795 (Fax)  
[www.itwasia.com.tw](http://www.itwasia.com.tw)

### ITW Switches and Switch Panels








Norway Road  
Hilsea, Portsmouth, England PO3 5HT  
44 (0) 23 92 694971 (Phone)  
44 (0) 23 92 666352 (Fax)  
[www.itwswitches.co.uk](http://www.itwswitches.co.uk)





# ITW SWITCHES SEALED IP67 PUSHBUTTONS

Design, development and manufacture of switch solutions

-  PUSH BUTTON
-  SNAP ACTION
-  ACTUATORS
-  SLIDE
-  ROTARY
-  CUSTOM ASSEMBLIES
-  MILITARY / AEROSPACE



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



[WWW.ITWSWITCHES.COM](http://WWW.ITWSWITCHES.COM)








800.544.3354

Downloaded from [Elcodis.com](http://Elcodis.com) - Electronic components distributor



# ITW SWITCHES SEALED IP67 PUSHBUTTONS

Design, development and manufacture of switch solutions

-  PUSH BUTTON
-  SNAP ACTION
-  ACTUATORS
-  SLIDE
-  ROTARY
-  CUSTOM ASSEMBLIES
-  MILITARY / AEROSPACE



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



[WWW.ITWSWITCHES.COM](http://WWW.ITWSWITCHES.COM)

800.544.335

# SEALED IP67 PUSHBUTTON SWITCHES

<b>Table Of Contents</b> .....	<b>ii – iii</b>
<b>Series 034: Sub-Miniature T-05 Space Saver</b> .....	<b>2 – 3</b>
<b>Series 39: 0.25 amp Miniature LED Lighted</b> .....	<b>4 – 5</b>
<b>Series 39-4 and 39-5 Mr. Clean®</b> .....	<b>6 – 7</b>
<b>Series 39-8: Surface Mount Miniature</b> .....	<b>8 – 9</b>
<b>Series 47: Low Cost Sealed Switch</b> .....	<b>10 – 11</b>
<b>Series 48: Electro-Mechanical Miniature Sealed</b> .....	<b>12 – 13</b>
<b>Series 48: Miniature Hall-Effect Sealed</b> .....	<b>14 – 15</b>
<b>Series 48M-EM: Panel Sealed Metal Electro-Mechanical Pushbutton</b> .....	<b>16 – 17</b>
<b>Series 48M-SS: Panel Sealed Metal Solid-State (Hall-Effect) Pushbutton</b> .....	<b>18 – 19</b>
<b>Series 49: Miniature Sealed ESD Resistant</b> .....	<b>20 – 21</b>
<b>Series 49-59: Fully Sealed with Wire Leads</b> .....	<b>22 – 23</b>
<b>Series 49-59: Panel Sealed with Terminals</b> .....	<b>24 – 25</b>
<b>Series 57: Vandal Resistant Miniature Sealed</b> .....	<b>26 – 27</b>
<b>Series 57M-EM: Miniature Panel Sealed Metal Electro-Mechanical Pushbutton</b> .....	<b>28 – 29</b>
<b>Series 57M-SS: Miniature Panel Sealed Metal Solid-State (Hall-Effect) Pushbutton</b> .....	<b>30 – 31</b>
<b>Series 58M-EM: Fully Sealed Metal Electro-Mechanical Pushbutton</b> .....	<b>32 – 33</b>
<b>Series 58M-SS: Fully Sealed Metal Solid-State (Hall-Effect) Pushbutton</b> .....	<b>34 – 35</b>
<b>Series 59: Miniature Panel Sealed Metal</b> .....	<b>36 – 37</b>
<b>Series 76-59: Extra Tough Sealed</b> .....	<b>38 – 39</b>
<b>Series 76-95: 10 amp Vandal Resistant</b> .....	<b>40 – 41</b>
<b>Series 76-97: Panel Sealed Switch</b> .....	<b>42 – 43</b>

## SUB-MINIATURE T-05 SPACE SAVER

This sub-miniature pushbutton switch offers high quality and reliability in a very small package. With gold contacts, this switch offers up to 1,000,000 cycles. This switch is ideal for applications where PC board space is at a premium.

### APPLICATIONS

- Reset switch
- Detect switch

### KEY FEATURES:

- Momentary action
- Gold contacts
- PC terminals
- SPST-NO (Form A) circuitry
- Variety of actuator lengths
- Up to 1,000,000 mechanical actuations

### ORDERING INFORMATION:

Part Number	Button Height
034-550-001	0.06
034-550-005	0.15
034-550-006	0.25
034-550-010	0.37
034-550-015	0.19



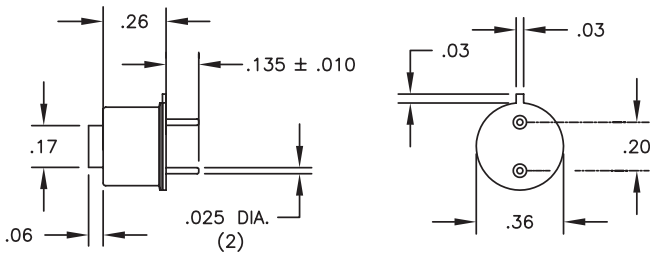
ACTUAL SIZE

### STANDARDS / AGENCY / RATINGS:

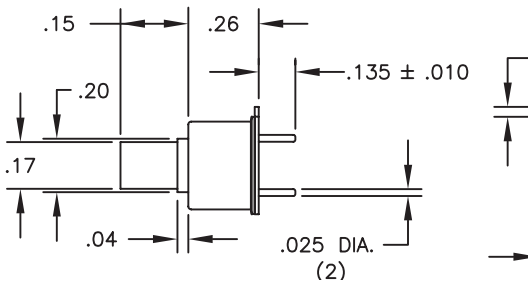




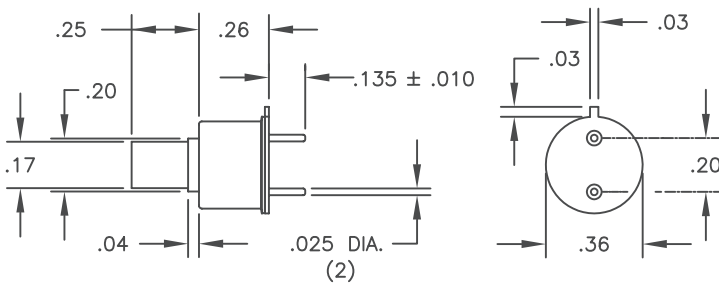
**034-550-001**



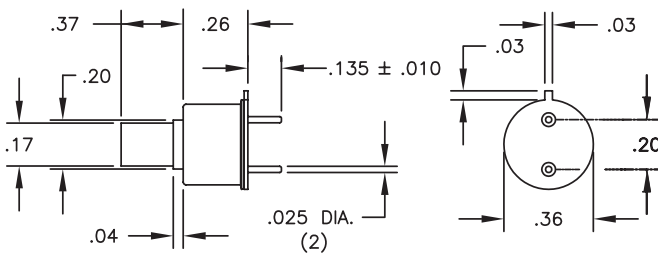
**034-550-005**



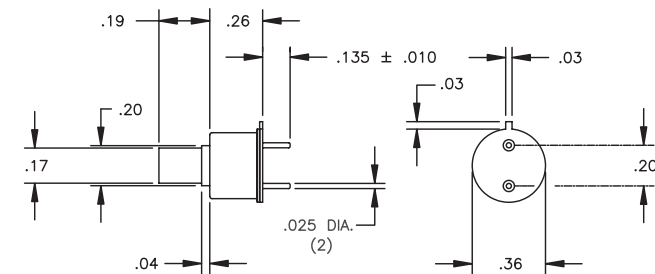
**034-550-006**



**034-550-010**



**034-550-015**



**MECHANICAL / ELECTRICAL CHARACTERISTICS:**

**Circuit:**  
SPST-NO (Form A) Momentary

**Temperature rating:**  
-30°C to +65°C  
(-22°F to +149°F)

**Life (mechanical):**  
1,000,000 actuations

**Contact rating:**  
100 mA @ 125 VAC

**Actuator:**  
thermoplastic (PBTP)

**Can:**  
Nickel-silver

**Contacts & terminals:**  
gold over nickel plate

## Series 39

### 0.25 AMP MINIATURE LED LIGHTED

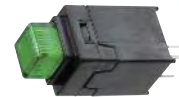
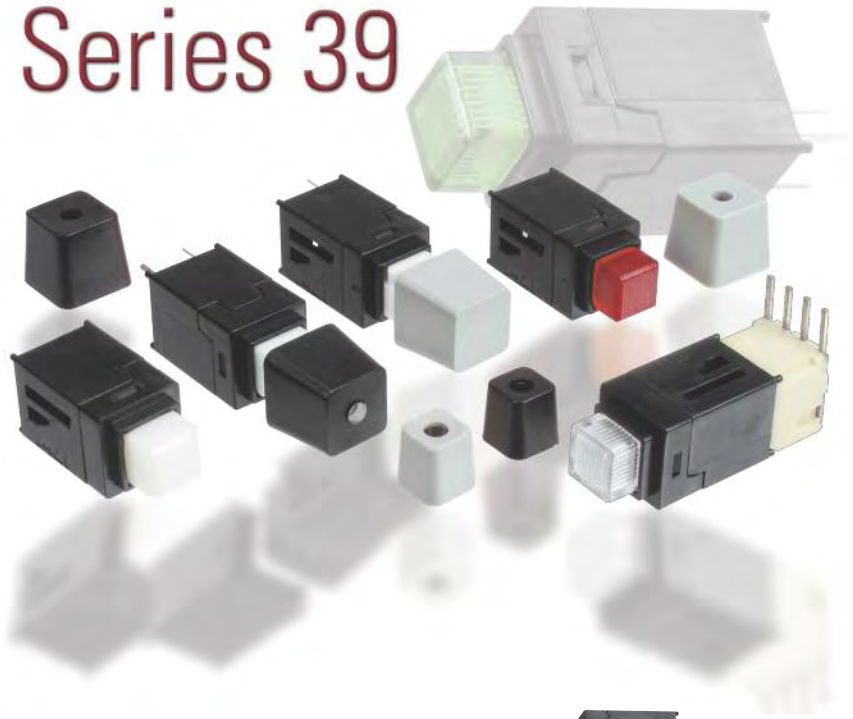
This highly reliable low cost pushbutton features bifurcated contacts that have wiping, self-cleaning action. The PC terminals allow for vertical mounting, while an optional connector allows for right angle mounting.

#### APPLICATIONS

- Control panel assemblies
- Recording equipment
- Telecom switching systems
- Scientific instrumentation
- Telecom test gear

#### KEY FEATURES:

- Momentary or maintained action
- Lighted (T-1 LED) or non-lighted
- Variety of button and keycap styles
- Wave solderable
- Bifurcated silver contacts



ACTUAL SIZE

#### ORDERING INFORMATION:

##### Switches

Part Number	Lighted	LED Color	Button Color	Button Style	Action
39-12101	Yes*	—	Clear	Button	Momentary
39-12111	Yes*	—	Red	Button	Momentary
39-12113	Yes*	—	Yellow	Button	Momentary
39-12114	Yes*	—	Smoke Grey	Button	Momentary
39-12502	No	—	White	Button	Momentary
39-12503	No	—	Red	Button	Momentary
39-12509	No	—	Black	Button	Momentary
39-12601	Yes	Red	Clear	Button	Momentary
39-12712	Yes	Green	Green	Button	Momentary
39-13101	Yes*	—	Clear	Button	Maintained
39-13113	Yes*	—	Yellow	Button	Maintained
39-22100	Yes*	—	—	Keycap	Momentary
39-22500	No	—	—	Keycap	Momentary
39-23100	Yes*	—	—	Keycap	Maintained
39-23500	No	—	—	Keycap	Maintained

\* LED not included; LED support 80-390003 supplied in bulk.

##### Button/Keycap Colors

Part Number	Lighted	Color	Cap Size
80-390101	Yes*	White	Large
80-390102	Yes*	Light Grey	Large
80-390103	Yes*	Dark Grey	Large
80-390106	No	Light Grey	Large
80-390107	No	Dark Grey	Large
80-390108	No	Black	Large
80-390111	Yes**	Black	Small

\* Requires light pipe 80-390100 (order separately)

\*\* Requires light pipe 80-390109 (order separately)

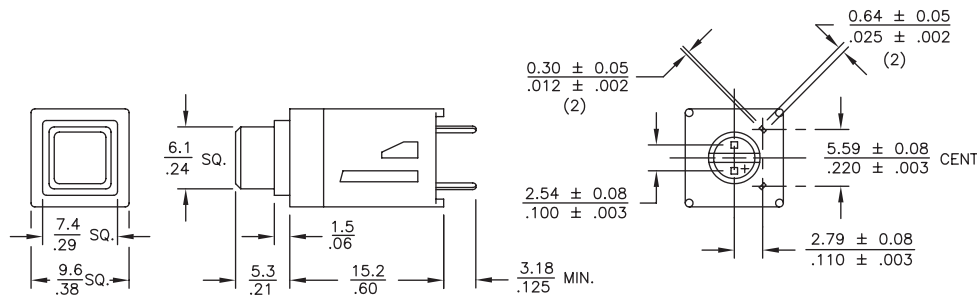
##### Connectors

Part Number	Mount
39-800001	In-Line

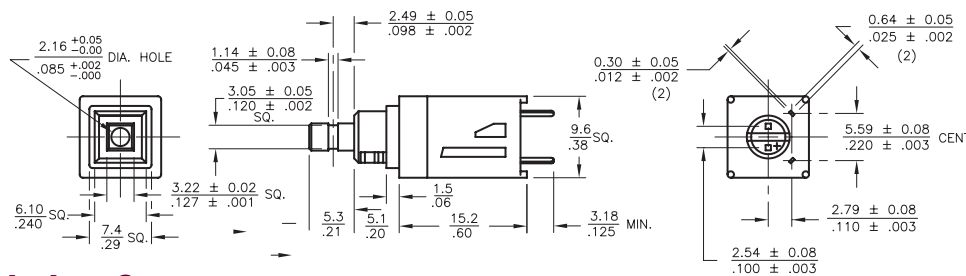
#### STANDARDS / AGENCY / RATINGS:



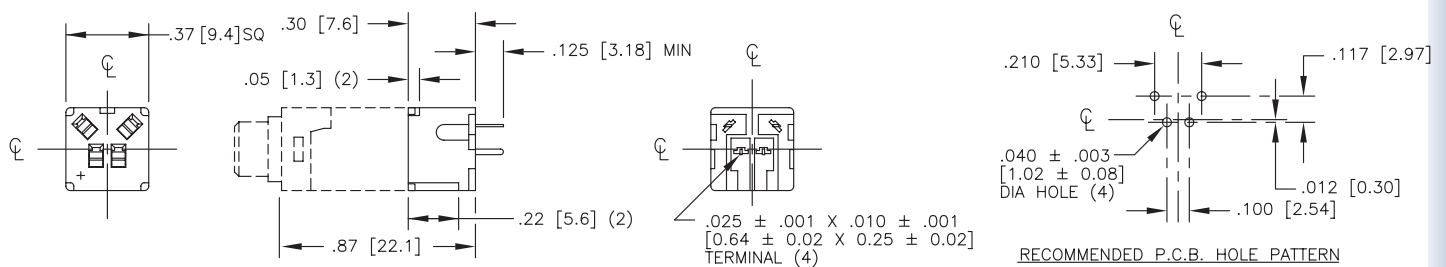
**STANDARD BUTTON STYLE**



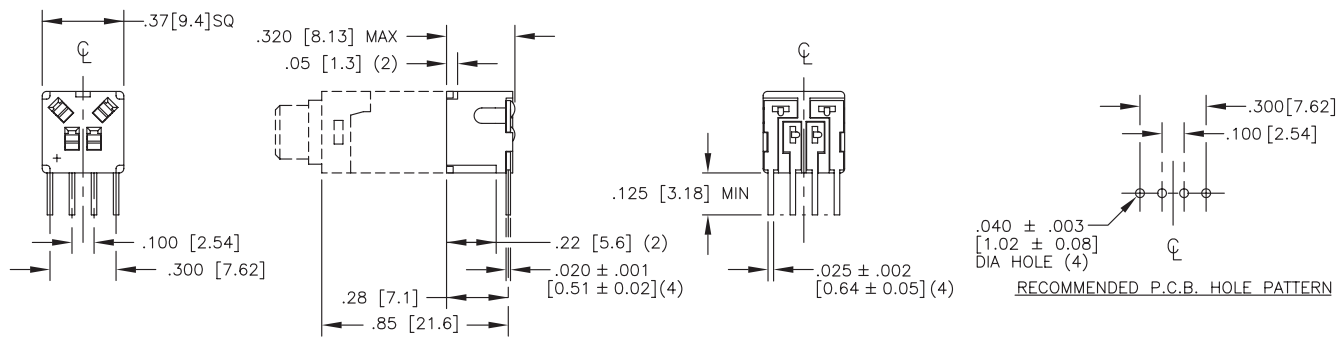
**KEYCAP BUTTON STYLE**



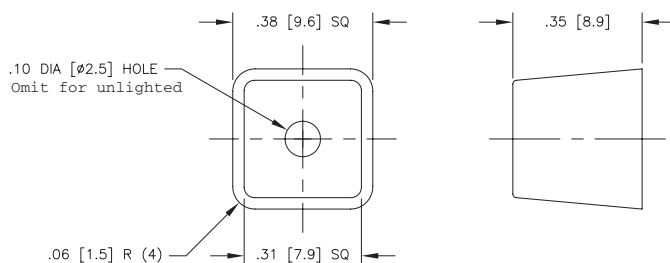
**IN-LINE CONNECTOR**



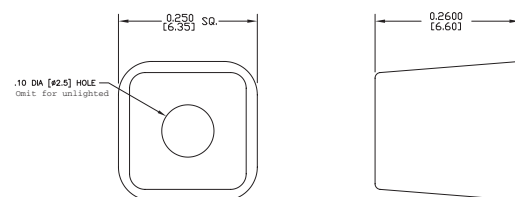
**RIGHT ANGLE CONNECTOR**



**LARGE LIGHTED & UNLIGHTED KEYCAP**



**SMALL LIGHTED & UNLIGHTED KEYCAP**



**MECHANICAL / ELECTRICAL CHARACTERISTICS:**

- Action:** SPST-NO-DB (Form X)
- Button travel:** 3.05 mm (.120 in) nominal
- Operating Force:** 113 grams nominal
- Contact Resistance:** Initial: 25 mΩ max. End of life: 50 mΩ max.
- Contact bounce:** Initial: 1 millisecond max. End of life 3 milliseconds max.
- Electrical life:** Momentary: 1 million cycles Maintained: 25,000 cycles
- Electrical rating:** .25A @ 30 VDC res.



## Series 39-4

### 0.25 AMP RIGHT-ANGLE DPST LIGHTED

This miniature pushbutton meets the needs for a cleaner trouble-free switch in confined space PC board applications. Only the terminal base is exposed to soldering and cleaning in this unique two-piece construction.



ACTUAL SIZE

### APPLICATIONS

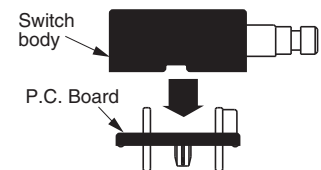
- Control panel assemblies
- Recording equipment
- Telecom switching systems
- Scientific instrumentation
- Telecom test gear

### KEY FEATURES:

- Momentary or maintained action
- Wave solderable
- Lighted (T-1 LED) or non-lighted
- Unique two piece construction
- Variety of button and keycap styles

### INSTALLATION:

The terminal base is installed manually, or with automatic equipment, on the PC board. It is then wave soldered along with other board components. The base is compatible with fluorinated, chlorinated and aqueous cleaning methods to remove flux. When the board and its components have been cleaned and dried, the pushbutton switch body, which has not been exposed to the contamination associated with these operations, is snapped positively onto the terminal base, where it is securely retained.



### ORDERING INFORMATION:

#### Button Style

Part Number	LED Color *	Button Color	Action
39-422106	—	Black	Momentary
39-422508	Red	Red	Momentary
39-422607	Green	Clear	Momentary
39-422609	Green	Green	Momentary
39-422707	Yellow	Clear	Momentary
39-422710	Yellow	Yellow	Momentary
39-423508	Red	Red	Maintained
39-423609	Green	Green	Maintained

\*Lighted styles have button and LED installed as required.

#### Keycap Style

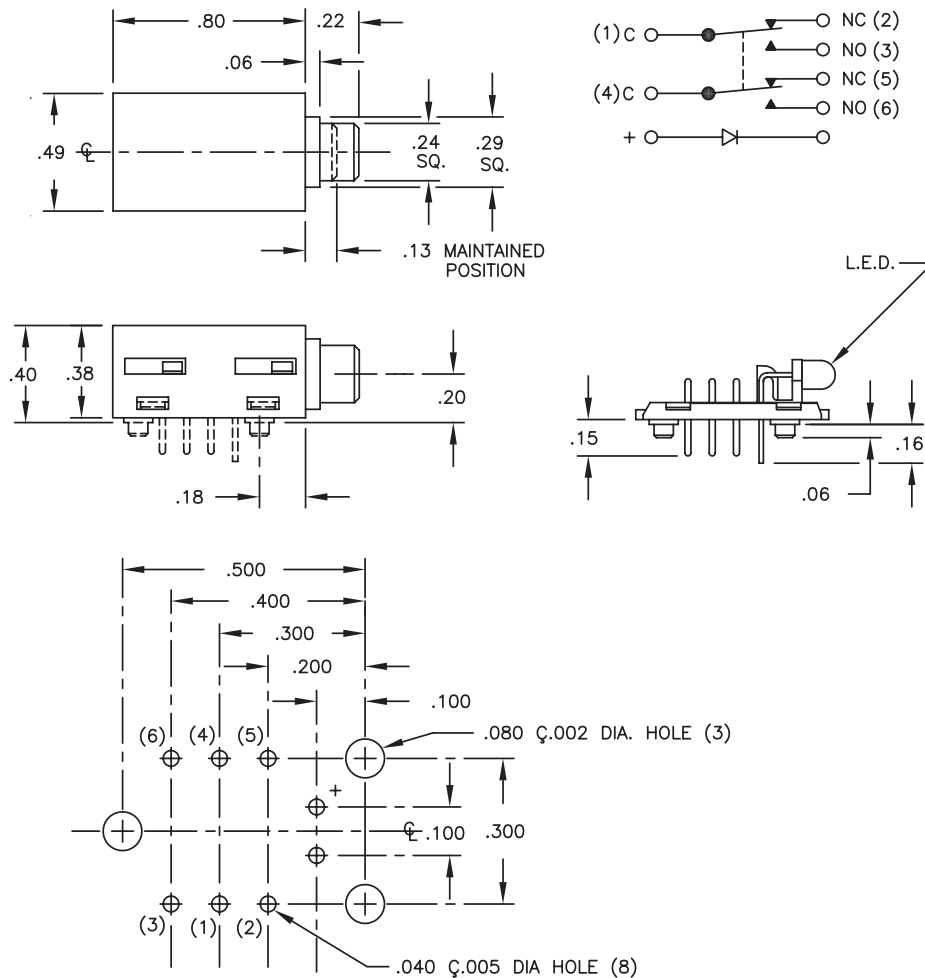
Part Number	LED Color *	Action
39-522101	—	Momentary
39-522701	Yellow	Momentary
39-523101	—	Maintained
39-523501	Red	Maintained

\* Order keycap and light pipe separately (see series 39) as necessary

### STANDARDS / AGENCY / RATINGS:



**BUTTON STYLE**



RECOMMENDED P.C. BOARD HOLE PATTERN  
COMPONENT SIDE

**MECHANICAL / ELECTRICAL CHARACTERISTICS:**

**Circuit:**  
DPDT-SB (Form CC)

**Operating force:**  
8 oz nominal

**Total travel:**  
.12 nominal

**Electrical rating:**  
.25A @ 30 VDC resistive max.

**Contact Resistance:**  
25 mΩ max. initial  
50 mΩ max. final

**Contact bounce:**  
500 microseconds max.

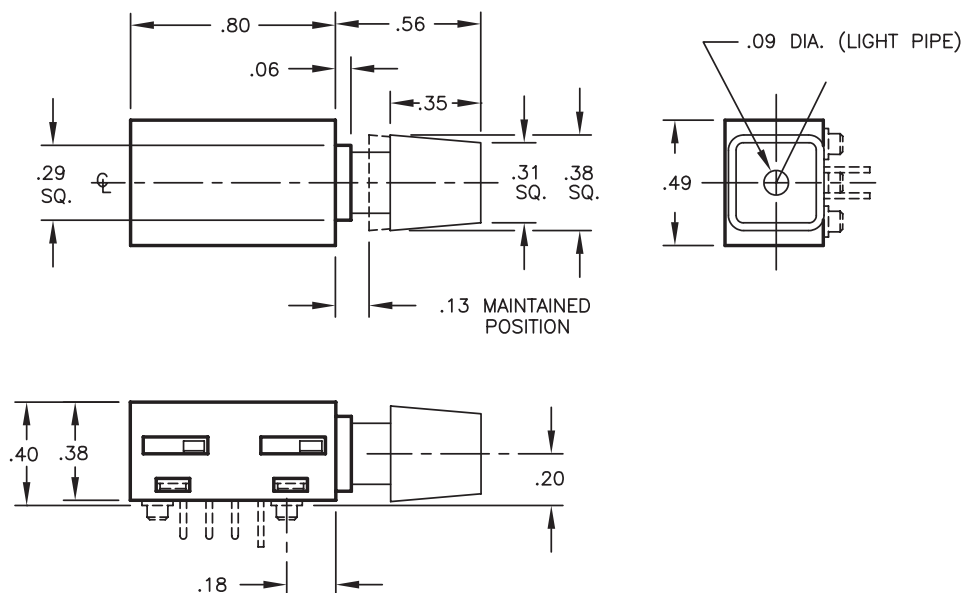
**Insulation resistance:**  
1000 MΩ min.  
@ 500 VDC

**Dielectric strength:**  
1000 VAC

**Life Momentary:**  
250,000 cycles

**Life Maintained:**  
25,000 cycles

**KEYCAP STYLE**



## Series 39-8

### SURFACE MOUNT / SOLID-STATE MINIATURE

The unique approach to SS/SMT switching allows the customer to process a Hall-effect chip and LED (optional) to their board. Then simply snap the ITW Switches Series 39-8 actuator in place. This can be done manually or robotically completing a totally process compatible switching system.

### APPLICATIONS

- Control panel assemblies
- Recording equipment
- Datacom switching systems
- Telecom switching systems
- Scientific instrumentation
- Computers

### KEY FEATURES:

- Solid-State (Hall-effect) switching
- No mechanical contacts
- Momentary or maintained action
- Lighted (Surface Mount LED) or non-lighted
- Key caps available
- Lower overall installed cost
- RoHS process compatibility



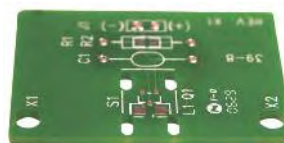
ACTUAL SIZE

### ORDERING INFORMATION:

#### Switches

Part Number	Action	Polarity
<b>39-82N</b>	Momentary	North
<b>39-82S</b>	Momentary	South
<b>39-83N</b>	Maintained	North
<b>39-83S</b>	Maintained	South

①—Customer Designed PCB



②—Customer Loaded PCB



③—ITW Series 39-8 SS/SMT Pushbutton Switch



④—Complete Assembly



### STANDARDS / AGENCY / RATINGS:





## 39-8XX

## MECHANICAL / ELECTRICAL CHARACTERISTICS:

**Action:**

SPST-NO

**Button travel:**

3.05 mm (0.13 in) nominal

**Operating Force:**

113 grams nominal

**Electrical life:**

Momentary: 1 million cycles

Maintained: 25,000 cycles

**Electrical rating:**

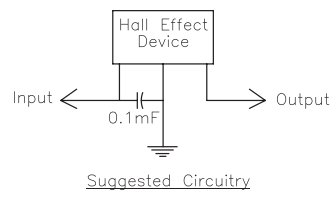
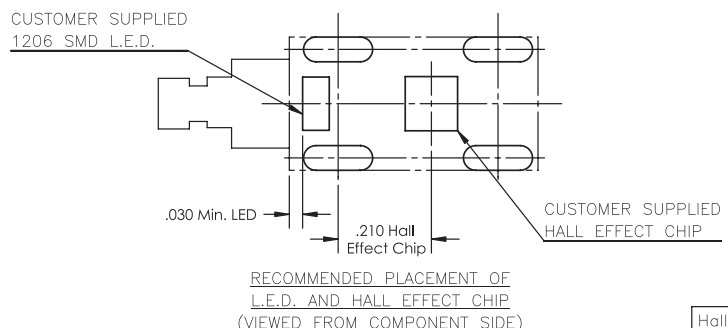
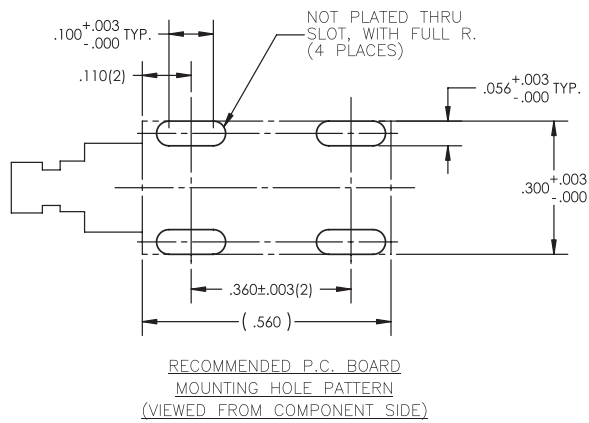
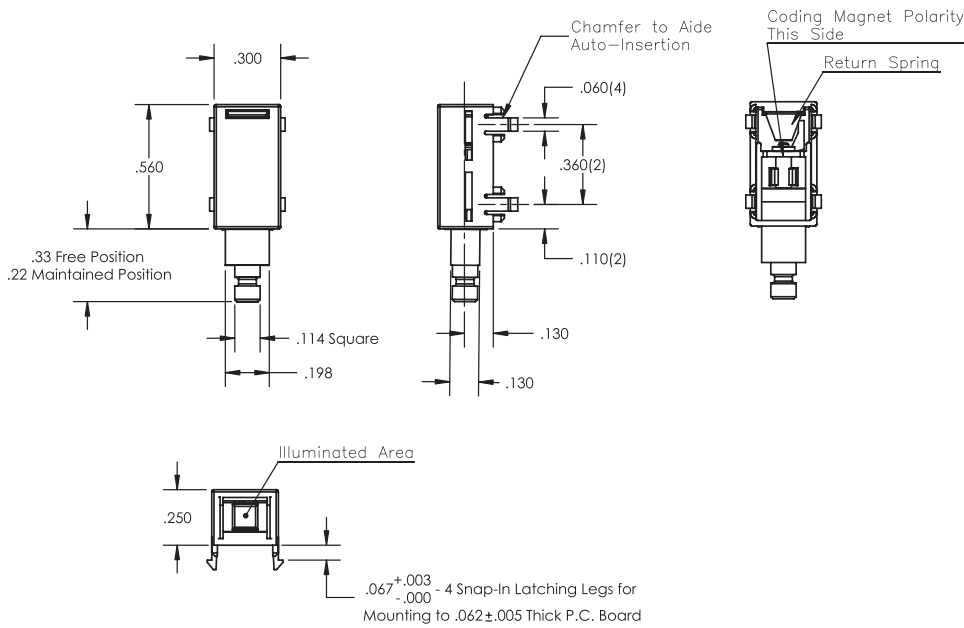
5VDC, 5mA typical

(when used with

Allegro Hall Effect

P/N A3280ELHLT,

customer supplied)



Copyright © 2011 ITW Switches 2011

## Series 47

### LOW COST SEALED

The Series 47 is a uniquely designed sealed miniature pushbutton switch. The silicone button and body can be panel mounted and terminated with a standard connector or mounted in a P.C. board. The switches come in two levels of sealing: a panel sealed only version and a fully sealed version with epoxy sealed base. Both meet respective IP67 requirements. The buttons are available in seven different colors. All this at a very affordable price.

### APPLICATIONS

- Marine equipment
- Medical equipment
- Outdoor controls
- Food processing equipment
- Recreational vehicles

### KEY FEATURES:

- Sealed to IP67
- Small size
- 7 button colors
- P.C. terminals (connector available)
- Long life
- Low cost



ACTUAL SIZE

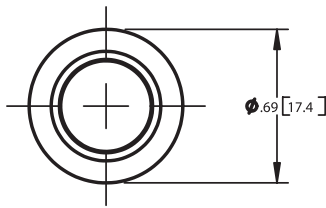
### ORDERING INFORMATION:

Part Number	Button Color	Panel Sealed	Epoxy Sealed Base
47-1111	Black	✓	✓
47-1121	Red	✓	✓
47-1131	Green	✓	✓
47-1141	White	✓	✓
47-1151	Yellow	✓	✓
47-1161	Blue	✓	✓
47-1171	Orange	✓	✓
47-2111	Black	✓	
47-2121	Red	✓	
47-2131	Green	✓	
47-2141	White	✓	
47-2151	Yellow	✓	
47-2161	Blue	✓	
47-2171	Orange	✓	

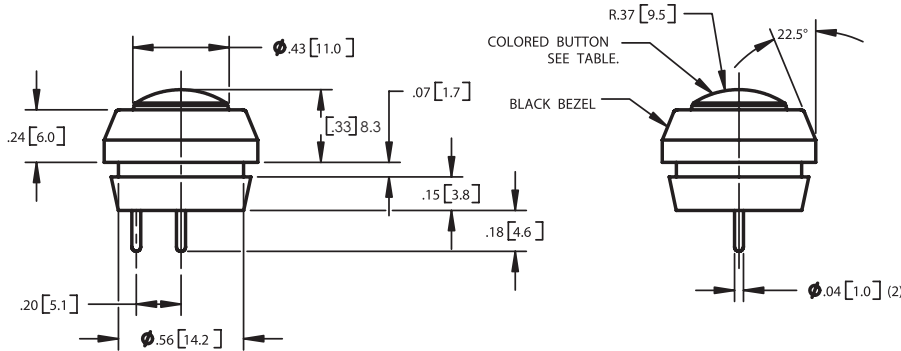
### STANDARDS / AGENCY / RATINGS:



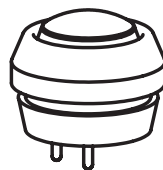
47-XXX



SCHEMATIC  
FORM A  
SPST-NO



Installation of a bi-directional TVS diode between the outer terminal of the switch and ground is recommended to avoid voltage spikes. Consult the factory for details.



**MECHANICAL / ELECTRICAL CHARACTERISTICS:**

**Travel (nom):**  
.020 inches

**Life:**  
100,000 cycles

**Operating force:**  
1,000 grams (nominal)

**Sealed to:**  
IP67

**Operating temperature:**  
-40°C to +85°C

**Button material:**  
silicone

**Contact:**  
metal snap dome providing a tactile feel

**Terminal finish:**  
gold over nickel

**Dielectric strength:**  
1,000 VAC

**Insulation Resistance:**  
10,000 MΩ

**Contact Resistance (initial):**  
<100 Ω

**Current rating:**  
20 mA @ 28 VDC

**Switch terminals mate with:**  
ITW Pancon Mas-Con  
Connector CE100F24-3-DB

**Recommended panel cut-out:**  
0.565" / 0.560" diameter  
(ø14.40 / 14.22)

**Recommended panel thickness:**  
0.060" (1.52) max



## Series 48EM

### MINIATURE SEALED ELECTRO-MECHANICAL

This rugged multi-option sealed pushbutton series offers the utmost in choices of mounting styles, colors, terminations, bezels, lighting and momentary or alternate-action switching. The Series 48 offers all these options in one compact package size.



### APPLICATIONS

- Office equipment
- Medical equipment
- Industrial machinery
- Outdoor controls
- Mass transportation
- Food processing equipment

### KEY FEATURES:

- Momentary or maintained action
- Gold contacts
- Many button colors
- Choice of LED colors (or non-lighted versions)
- Long life
- Solder or PC terminals
- Panel sealed to IP 67

ACTUAL SIZE

### ORDERING INFORMATION:

Switch Function	Switch Termination	Module Type	Bezel Type	LED Color	Button Color	Mounting Type	Voltage Resistor
Momentary	Solder Tabs	<b>48-1</b>	<b>RB</b> - Round, Black	<b>N</b> - None	<b>RD</b> - Red	<b>B</b> - Bushing	If Blank*
Maintained	Solder Tabs	<b>48-2</b>	<b>SB</b> - Square, Black	<b>R</b> - Red	<b>GR</b> - Green	<b>S</b> - Snap-fit	<b>05</b> - 5V forward
Momentary	PC	<b>48-5</b>	<b>RC</b> - Round, Chrome	<b>G</b> - Green	<b>BK</b> - Black		
Maintained	PC	<b>48-6</b>	<b>SC</b> - Square, Chrome	<b>Y</b> - Yellow	<b>BL</b> - Blue		
Momentary	Wire Leads	<b>48-A</b>		<b>A</b> - Amber	<b>YL</b> - Yellow		
Maintained	Wire Leads	<b>48-B</b>		<b>B</b> - Blue	<b>OR</b> - Orange		
				<b>W</b> - White	<b>CR</b> - Chrome		
					<b>PK</b> - Black with Standby Symbol		
					<b>WH</b> - White		

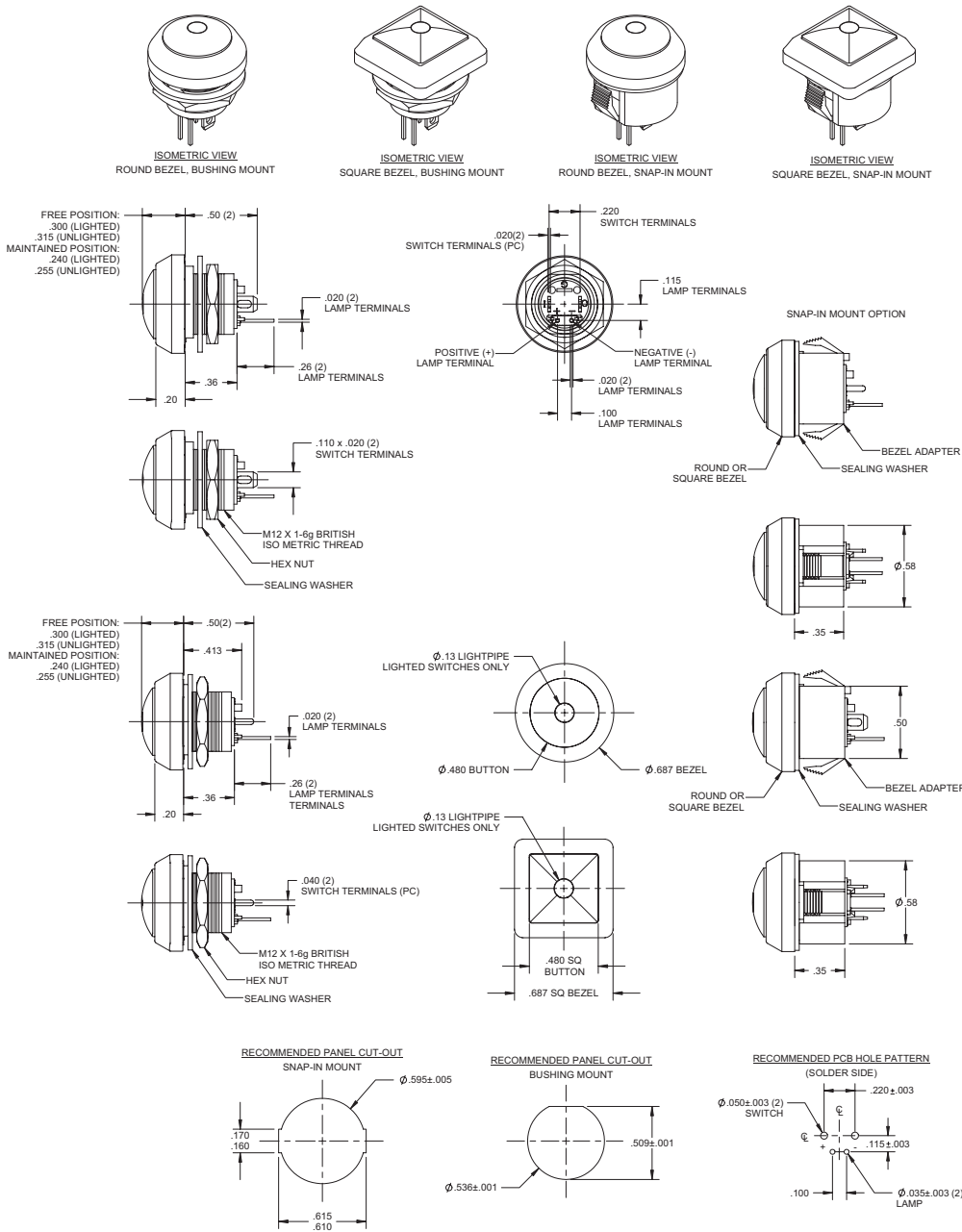
**48-**

\* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

### STANDARDS / AGENCY / RATINGS:



## PRODUCT DRAWINGS



## MECHANICAL / ELECTRICAL CHARACTERISTICS:

### Circuit:

SPST-NO-DB

### Button travel (nominal):

0.09 inches / 2.3 mm

### Operating force (nominal):

3N / 306 grams

### Contact bounce (nominal):

1 millisecond

### Panel thickness:

0.02 – 0.12 inches / 0.5 – 3mm

### Temperature index:

-40° F to + 185° F

### LED operating temperature:

-13° F to +185° F /

-25° C to +85° C

### Current ratings (resistive):

250mA @ 12VDC, 100K cycles

150mA @ 28VDC, 150K cycles  
(momentary)

100mA @ 48VDC, 100K cycles

10mA @ 12VDC, 1 million cycles  
(momentary)

### Dielectric strength:

1,000 VAC

### Insulation resistance:

1G OHM

### Contact resistance:

50 mΩ max (initial)

### Torque (max):

10 inch pounds

## Series 48SS

### MINIATURE HALL-EFFECT SEALED

This rugged sealed pushbutton switch uses a Hall-Effect sensor to achieve extremely long life, up to 1,000,000 cycles momentary. This switch is suited for harsh environments where long life and reliability are needed.



### APPLICATIONS

- Communications
- Data entry
- Hand-held control modules
- Outdoor controls
- Mass transport controls
- Instrumentation

### KEY FEATURES:

- 1,000,000 cycles momentary
- Momentary and maintained action
- Hall-Effect technology
- Choice of LED colors (or non-lighted versions)
- Panel sealed to IP67
- Variety of Button colors
- Square and round versions available

ACTUAL SIZE

### ORDERING INFORMATION:

Switch Function	Switch Termination	Module Type	Bezel Type	LED Color	Button Color	Mounting Type	Voltage Resistor
Momentary	Solder Tabs	<b>48-3</b>	<b>RB</b> - Round, Black	<b>N</b> - None	<b>RD</b> - Red	<b>B</b> - Bushing	If Blank*
Maintained	Solder Tabs	<b>48-4</b>	<b>SB</b> - Square, Black	<b>R</b> - Red	<b>GR</b> - Green	<b>S</b> - Snap-fit	<b>05</b> - 5V forward
Momentary	PC	<b>48-7</b>	<b>RC</b> - Round, Chrome	<b>G</b> - Green	<b>BK</b> - Black		
Maintained	PC	<b>48-8</b>	<b>SC</b> - Square, Chrome	<b>Y</b> - Yellow	<b>BL</b> - Blue		
Momentary	Wire Leads	<b>48-C</b>		<b>A</b> - Amber	<b>YL</b> - Yellow		
Maintained	Wire Leads	<b>48-D</b>		<b>B</b> - Blue	<b>OR</b> - Orange		
				<b>W</b> - White	<b>CR</b> - Chrome		
					<b>PK</b> - Black with Standby Symbol		
					<b>WH</b> - White		

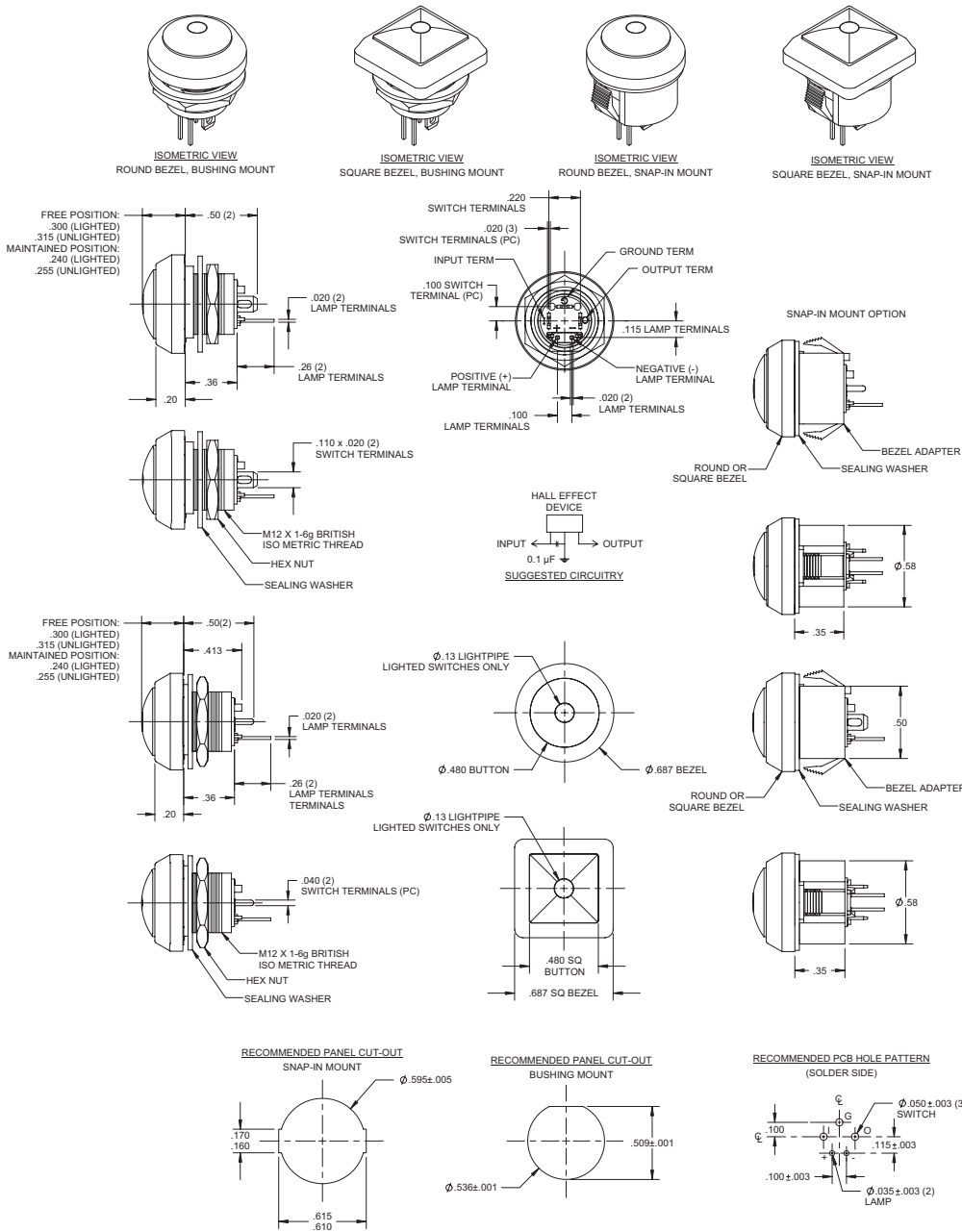
48-

\* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

### STANDARDS / AGENCY / RATINGS:



## PRODUCT DRAWINGS



## MECHANICAL / ELECTRICAL CHARACTERISTICS:

### Circuit:

SPST-NO

### Button travel (nominal):

0.09 inches / 2.3 mm

### Life (mechanical) (nominal):

1,000,000 cycles (momentary)  
100,000 cycles (maintained)

### Operating force (nominal):

3N / 306 grams

### Panel thickness:

0.02 – 0.12 inches / 0.5 – 3mm

### Temperature index:

-40°F to +185°F

### LED operating temperature:

-13° F to +185° F /  
-25° C to +85° C

### Supply voltage:

4.2V to 24V, 26.5V Max.

### Supply current:

B<Brp, Vcc=12V: 3mA Typ.  
To 8mA Max.  
B>Bop, Vcc=12V: 4mA Typ.  
To 8mA Max.

### Output current:

20 mA

### Reverse battery voltage:

-30V Max.

### Reverse output current:

-50mA Max.

### Torque (max):

10 inch pounds



## Series 48M-EM

### PANEL SEALED METAL ELECTRO-MECHANICAL

Built on the proven series 48 platform these rugged switches come in stainless steel or chrome plated housings with either momentary or maintained action and lighted or unlighted versions. The variety of options in this compact package size make the 48M ideal for many applications



ACTUAL SIZE

### APPLICATIONS

- Outdoor Controls
- Security Equipment
- Medical Equipment
- Food Processing Equipment
- Military Equipment
- Industrial Machinery
- Transportation: Mass-Transit, Lift Trucks

### KEY FEATURES:

- Momentary or Maintained Action
- Stainless Steel Housing
- Center Spot or Ring Illumination
- Variety of LED colors
- Electro-Mechanical
- Panel Sealed to IP67
- ROHS Compliant
- Gold Plated Contact and Terminals

### ORDERING INFORMATION:

#### SWITCH FUNCTION:

1. MECHANICAL, MOMENTARY, SOLDER TERMINAL
2. MECHANICAL, MAINTAINED, SOLDER TERMINAL
5. MECHANICAL, MOMENTARY, PC TERMINAL
6. MECHANICAL, MAINTAINED, PC TERMINAL
- A. MECHANICAL, MOMENTARY, WIRE LEADS
- B. MECHANICAL, MAINTAINED, WIRE LEADS
9. SPECIAL, DIGITS ARE IN SERIAL ORDER

#### HOUSING MATERIAL:

1. STAINLESS STEEL
2. ZINC ALLOY CHROME PLATED

#### ILLUMINATION:

0. NON-LIT
1. CENTER SPOT ILLUMINATION
2. RING ILLUMINATION
3. ILLUMINATED POWER SYMBOL

#### LED COLOR:

- N. NONE
- G. GREEN L.E.D.
- R. RED L.E.D.
- A. AMBER L.E.D.
- B. BLUE L.E.D.
- W. WHITE L.E.D.

#### VOLTAGE RESISTOR

- If BLANK \*
- 05 5V FORWARD

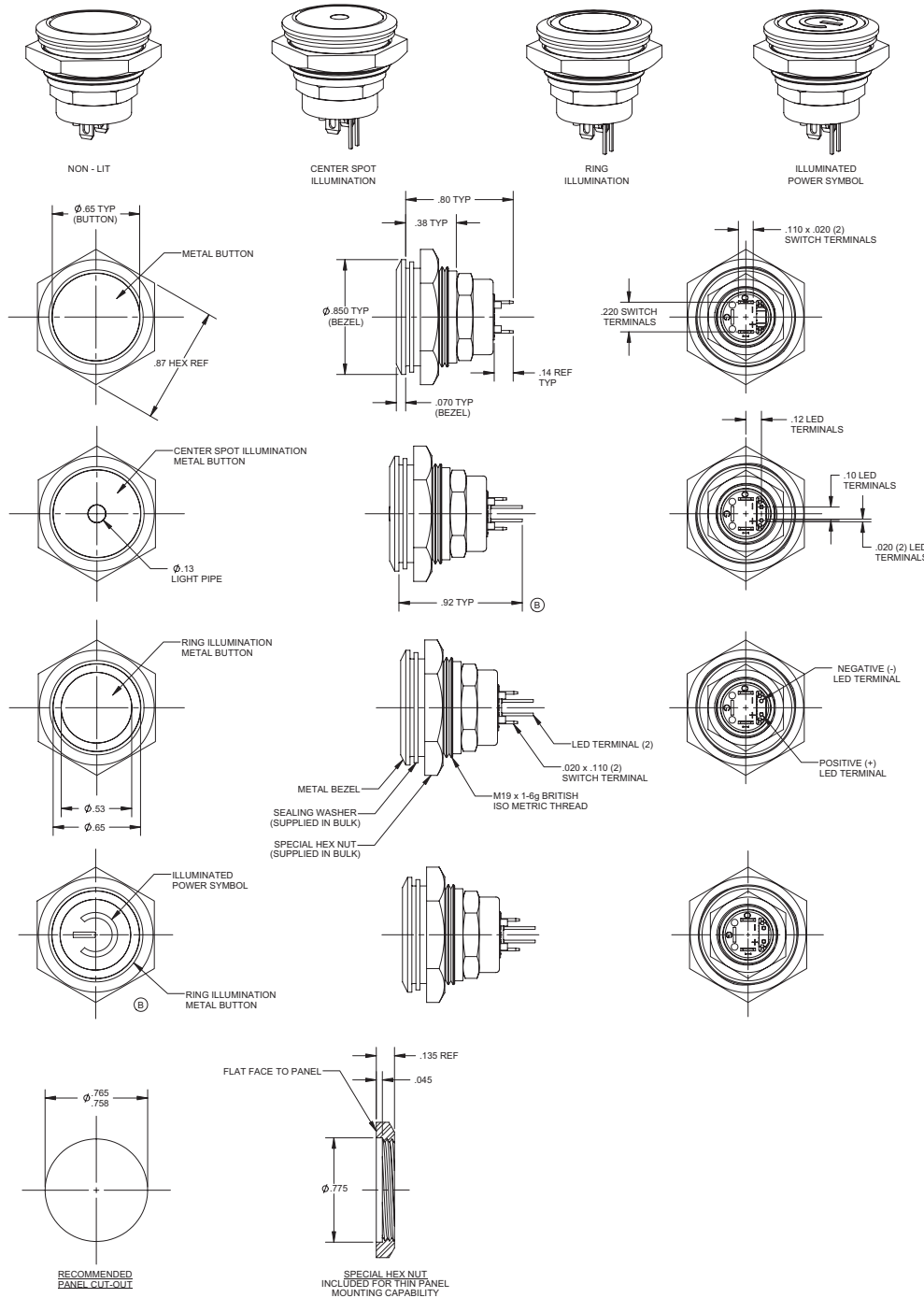
48M-

\* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

### STANDARDS / AGENCY / RATINGS:



## PRODUCT DRAWINGS



## PANEL MOUNTING AND CONSTRUCTION INFORMATION

The series 48M mounts easily into panels of minimum 0.50" (1.3 mm) and maximum 0.150" (3.8 mm) thickness. Front panel sealing to IP67 is achieved by a sealing o-ring fitted to the body of the switch before it is inserted into the panel hole cut-out. It is held onto the panel by means of a metal hex nut tightened down to a torque of 10 inch pounds to achieve the correct sealing pressure.

## MECHANICAL / ELECTRICAL CHARACTERISTICS:

### Circuit:

SPST-NO-DB

### Button travel (nominal):

0.09 inches / 2.3 mm

### Operating force (nominal):

3N / 306 grams

### Contact bounce (nominal):

1 millisecond

### Panel thickness:

0.50" – 0.150" 1.3 – 3.8mm)

### Temperature index:

-40°C to +85°C

### LED operating temperature:

-13° F to +185° F /

-25° C to +85° C

### Torque (max):

10 inch pounds

### LED operating temperature:

-13° F to +185° F /

-25° C to +85° C

### Current ratings (resistive):

250mA @ 12VDC, 100K cycles

150mA @ 28VDC, 150K cycles  
(momentary)

100mA @ 48VDC, 100K cycles

10mA @ 12VDC, 1 million cycles  
(momentary)

## ELECTRO-MECHANICAL

### Dielectric strength:

1,000 VAC

### Insulation resistance:

1 GΩ

### Contact resistance:

50 mΩ max (initial)

## Series 48M-SS

### PANEL SEALED METAL HALL-EFFECT

Built on the proven series 48 platform these rugged switches come in stainless steel or chrome plated housings with either momentary or maintained action and lighted or unlighted versions. The variety of options in this compact package size make the 48M ideal for many applications.



ACTUAL SIZE

### APPLICATIONS

- Outdoor Controls
- Security Equipment
- Medical Equipment
- Food Processing Equipment
- Military Equipment
- Industrial Machinery
- Transportation: Mass-Transit, Lift Trucks

### KEY FEATURES:

- Momentary or Maintained Action
- Stainless Steel Housing
- Center Spot or Ring Illumination
- Variety of LED colors
- Solid State
- Panel Sealed to IP67
- ROHS Compliant
- Gold Plated Contact and Terminals

### ORDERING INFORMATION:

#### SWITCH FUNCTION:

3. SOLID STATE, MOMENTARY, SOLDER TERMINAL
4. SOLID STATE, MAINTAINED, SOLDER TERMINAL
7. SOLID STATE, MOMENTARY, PC TERMINAL
8. SOLID STATE, MAINTAINED, PC TERMINAL
- C. SOLID STATE, , MOMENTARY, WIRE LEADS
- D. SOLID STATE, , MAINTAINED, WIRE LEADS
9. SPECIAL, DIGITS ARE IN SERIAL ORDER

#### HOUSING MATERIAL:

1. STAINLESS STEEL
2. ZINC ALLOY CHROME PLATED

#### ILLUMINATION:

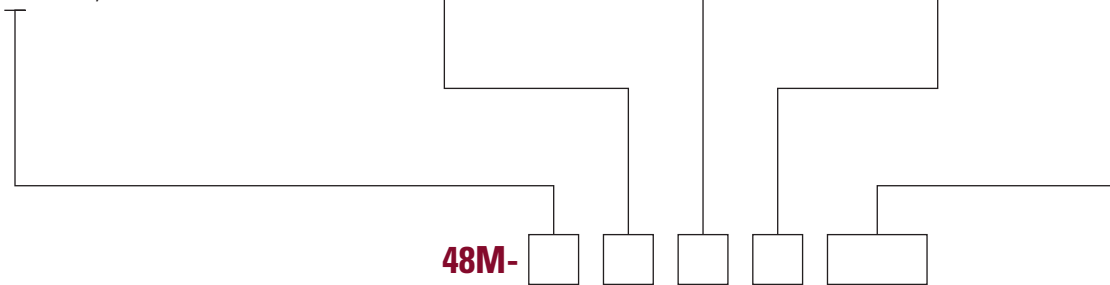
0. NON-LIT
1. CENTER SPOT ILLUMINATION
2. RING ILLUMINATION
3. ILLUMINATED POWER SYMBOL

#### LED COLOR:

- N. NONE
- G. GREEN L.E.D.
- R. RED L.E.D.
- A. AMBER L.E.D.
- B. BLUE L.E.D.
- W. WHITE L.E.D.

#### VOLTAGE RESISTOR

- IF BLANK \*
- 05 5V FORWARD

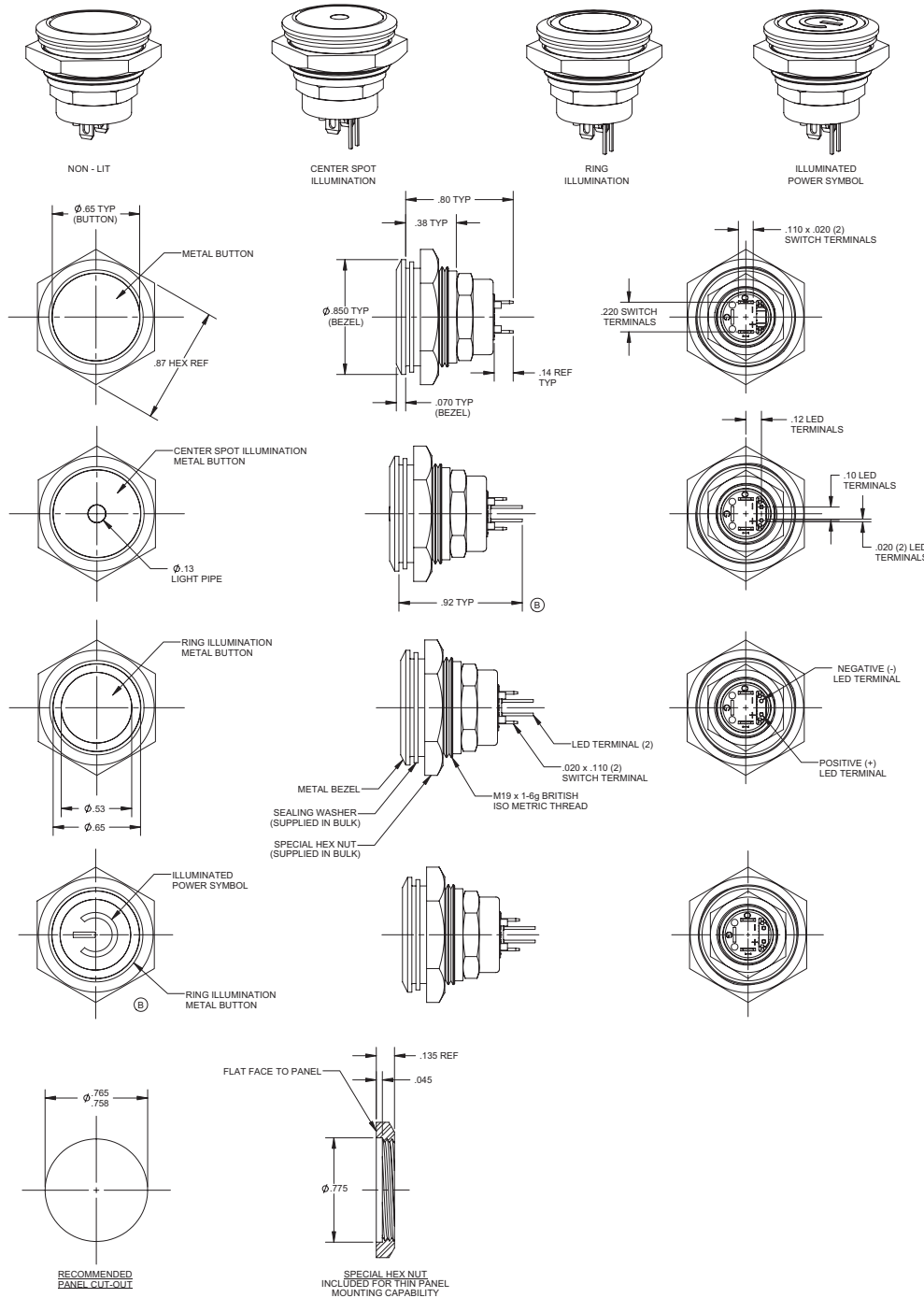


\* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

### STANDARDS / AGENCY / RATINGS:



## PRODUCT DRAWINGS



## MECHANICAL / ELECTRICAL CHARACTERISTICS:

### Circuit:

SPST-NO

### Button travel (nominal):

0.09 inches / 2.3 mm

### Life (mechanical) (nominal):

1,000,000 cycles (momentary)

100,000 cycles (maintained)

### Operating force (nominal):

3N / 306 grams

### Panel thickness:

0.02 – 0.12 inches / 0.5 – 3mm

### Temperature index:

-40°F to + 185°F

### LED operating temperature:

-13° F to +185° F /

-25° C to +85° C

### Supply voltage:

4.2V to 24V, 26.5V Max.

### Supply current:

B<Brp, Vcc=12V: 3mA Typ.

To 8mA Max.

B>Bop, Vcc=12V: 4mA Typ.

To 8mA Max.

### Output current:

20 mA

### Reverse battery voltage:

-30V Max.

### Reverse output current:

-50 mA Max.

### Torque (max):

10 inch pounds

## PANEL MOUNTING AND CONSTRUCTION INFORMATION

The series 48M mounts easily into panels of minimum 0.50" (1.3 mm) and maximum 0.150" (3.8 mm) thickness. Front panel sealing to IP67 is achieved by a sealing o-ring fitted to the body of the switch before it is inserted into the panel hole cut-out. It is held onto the panel by means of a metal hex nut tightened down to a torque of 10 inch pounds to achieve the correct sealing pressure.



## Series 49

### MINIATURE SEALED ESD RESISTANT

This switch series is rugged, panel sealed, available with round or square bezels and LED lighted or non-lighted. Bushing mount or snap-in mounting available. Series 49 switches are ideal for demanding applications in harsh environments where water, moisture or dust are problematic.



ACTUAL SIZE

### APPLICATIONS

- Industrial equipment control handles
- Dog training control modules
- Outdoor controls
- Medical equipment
- Beverage dispensing

### KEY FEATURES:

- Normally open or closed circuitry
- Momentary action
- LED lighted or non-lighted
- .110 Quick Connect or Solder terminals available
- Gold contacts
- ESD 15KV minimum
- Panel sealed to IP67
- Long life – up to 1 million cycles
- Threaded or snap-in mounting

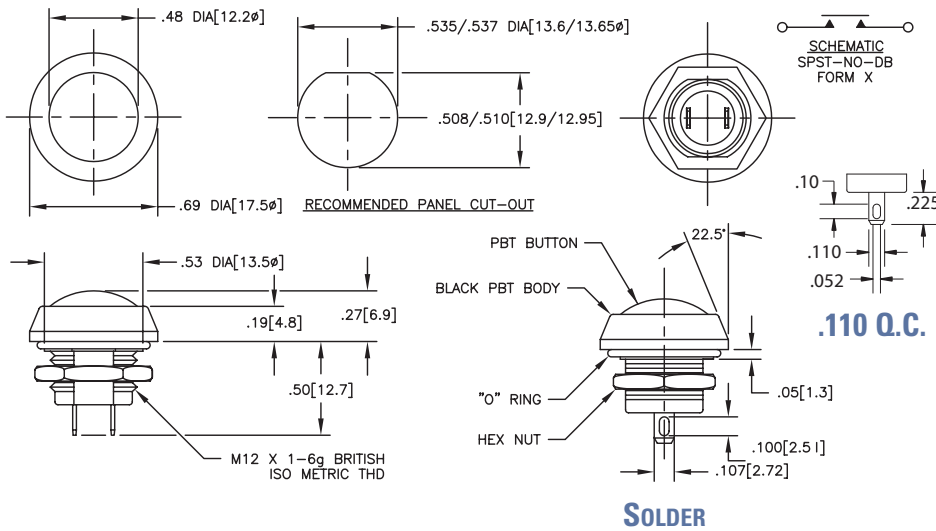
### ORDERING INFORMATION:

Part Number	Body Style	Button Color	LED Color	Contacts	Terminals
49-111	Round bezel	Black	—	Normally Open	Solder
49-112	Round bezel	Red	—	Normally Open	Solder
49-113	Round bezel	Green	—	Normally Open	Solder
49-411G	Illuminated round	Black	Green	Normally Open	Solder
49-411R	Illuminated round	Black	Red	Normally Open	Solder
49-412G	Illuminated round	Red	Green	Normally Open	Solder
49-412R	Illuminated round	Red	Red	Normally Open	Solder
49-413G	Illuminated round	Green	Green	Normally Open	Solder
49-413R	Illuminated round	Green	Red	Normally Open	Solder
49-9111	Snap-in round	Black	—	Normally Open	Solder
49-9113	Snap-in round	Green	—	Normally Open	Solder
49-611	Round bezel	Black	—	Normally Closed	Solder
49-612	Round bezel	Red	—	Normally Closed	Solder
49-613	Round bezel	Green	—	Normally Closed	Solder
49-131	Round bezel	Black	—	Normally Open	.110 QC
49-132	Round bezel	Red	—	Normally Open	.110 QC
49-133	Round bezel	Green	—	Normally Open	.110 QC

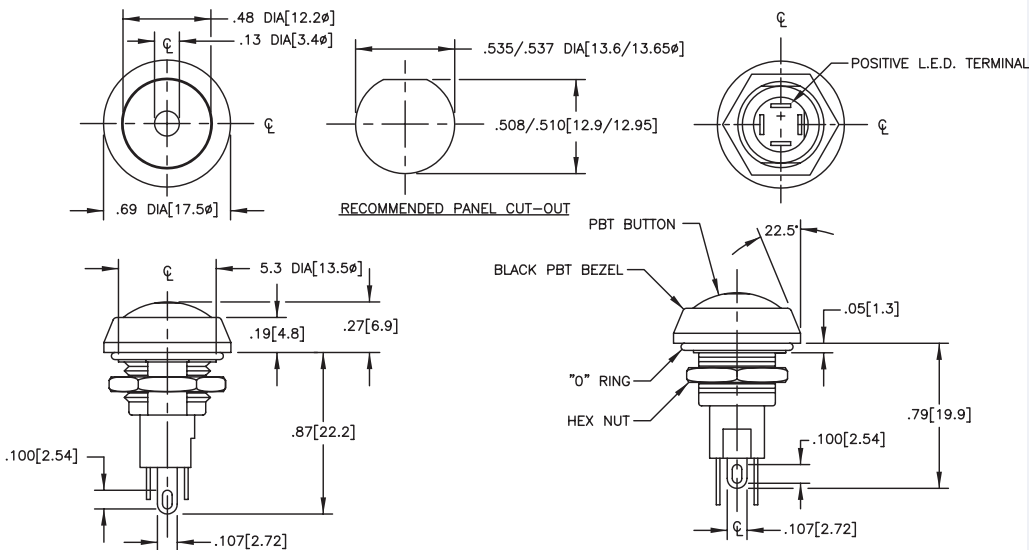
### STANDARDS / AGENCY / RATINGS:



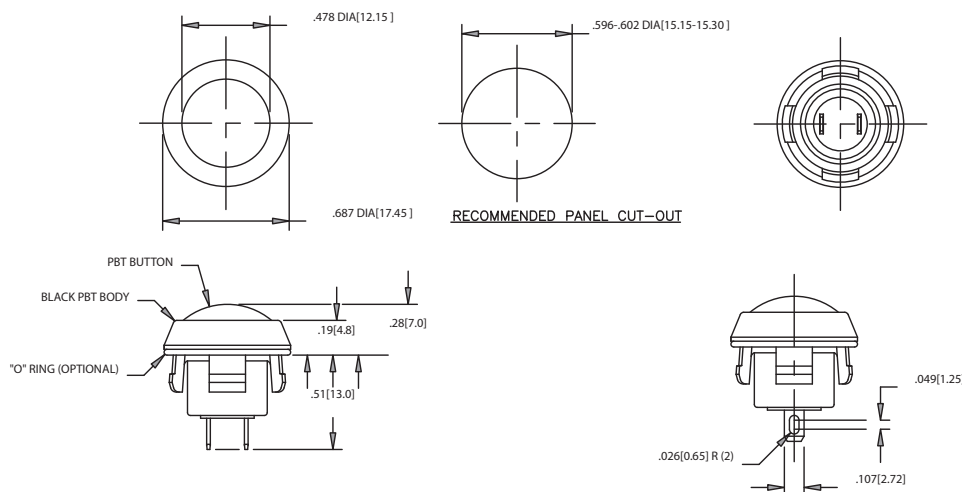
49-11X & 49-61X SERIES



49-41X SERIES



49-91X SERIES



MECHANICAL / ELECTRICAL CHARACTERISTICS:

**Circuit:**  
SPST-NO-DB or SPST-NC-DB

**Travel (nominal):**  
0.09 inches / 2.3 mm

**Life (nominal):**  
1,000,000 cycles (mechanical)  
500,000 cycles (electrical)

**Operating temperature:**  
-20°C to +85°C  
(-4°F to +185°F)

**Operating force (nominal):**  
3N / 306 grams

**Contact bounce (nominal):**  
1 millisecond

**LED:**  
T-1

**Dielectric strength:**  
1,000 VAC

**Insulation resistance:**  
1 GΩ

**Contact resistance:**  
50 mΩ max (initial)

**Switching power (max):**  
16 VA AC

**Mounting Torque (max):**  
15 inch pounds

Electrical Ratings:

Circuitry	Current	Voltage
SPST-DB-NO	400 mA	32 VAC Res
SPST-DB-NC	100 mA	50 VDC Res
	125 mA	125 VAC Res

## Series 49-59W

### FULLY SEALED PUSHBUTTON WITH WIRE LEADS

This fully sealed switch series is SPST-DB for a variety of circuit requirements. The double break mechanism also provides reliable switching of DC loads. This rugged switch is ideal for harsh environments.

### APPLICATIONS

- Communications
- Instrumentation
- Data processing
- Military environments
- Mass transport controls
- Dry circuit switching

### KEY FEATURES:

- Fully sealed to IP67
- Momentary action
- Wire leads
- Flame retardant UL rated material
- Gold plated contacts
- Life up to 500,000 cycles



ACTUAL SIZE

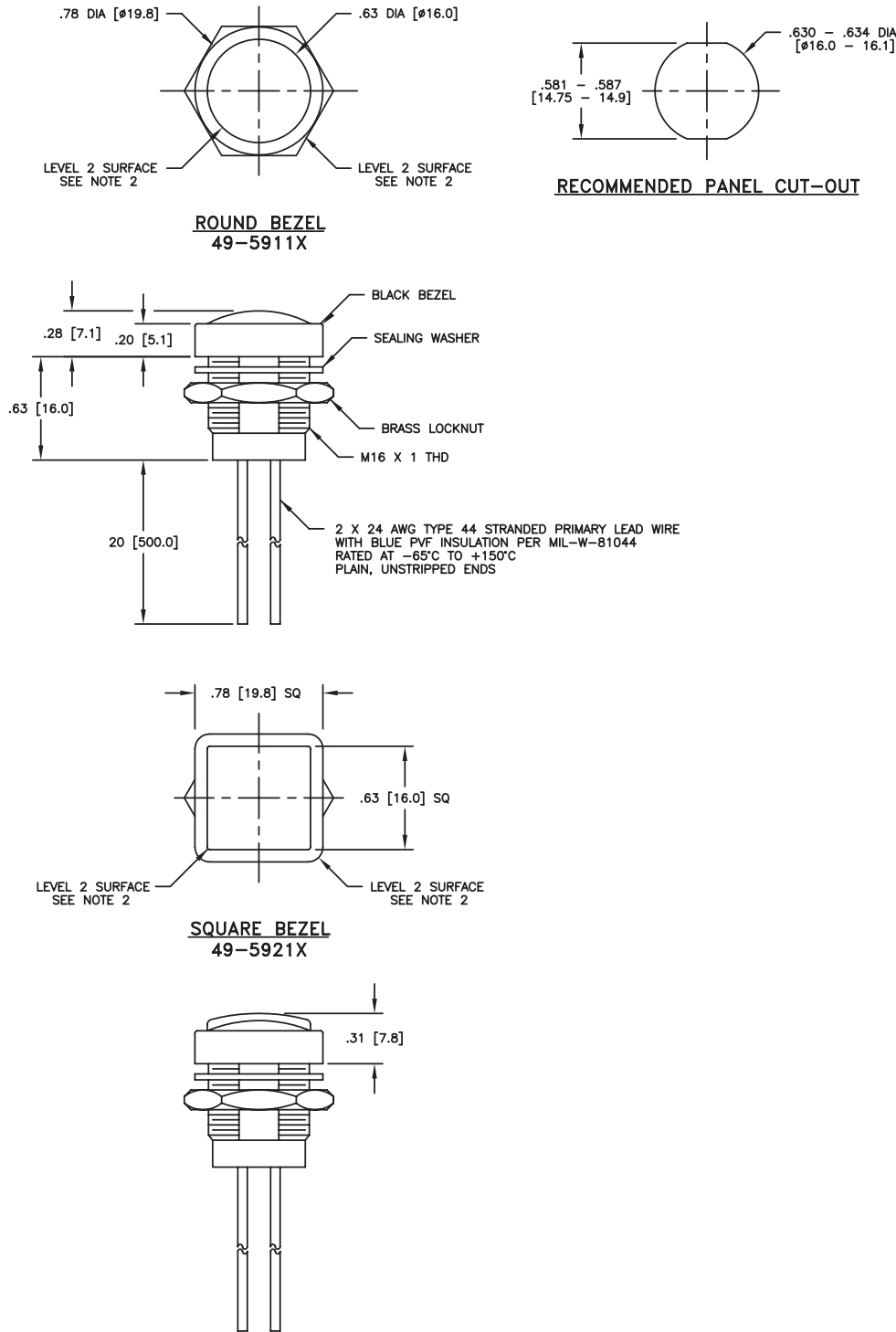
### ORDERING INFORMATION:

Part Number	Button Style	Button Color
49-59111	Round bezel	Black
49-59112	Round bezel	Red
49-59113	Round bezel	Green
49-59211	Square bezel	Black
49-59212	Square bezel	Red
49-59213	Square bezel	Green

### STANDARDS / AGENCY / RATINGS:



PRODUCT DRAWINGS



MECHANICAL / ELECTRICAL CHARACTERISTICS:

- Circuit:**  
SPST-NO-DB
- Travel:**  
0.09 inches / 2.3 mm (nominal)
- Operating force:**  
3N / 306 grams
- Panel thickness:**  
0.31 inches 8 mm (Max)
- Contact material:**  
gold plated palladium nickel
- Contact resistance (initial):**  
150 mΩ max including wire leads
- Current Rating (typical):**  
400mA at 32 VAC resistive  
100mA at 50 VDC resistive  
125mA at 125 VAC resistive
- Dielectric strength:**  
1000 VAC for 1 min
- Insulation resistance:**  
1 GΩ @ 500 VDC
- Contact resistance:**  
50 mΩ max initial including leads
- Life (nominal):**  
1,000,000 cycles (mechanical)  
500,000 (max) cycles (electrical)
- Operating temperature:**  
-55°C to 105°C  
(-67°F to +221°F)
- Body and button material:**  
PBT



## Series 49-59T

### PANEL SEALED PUSHBUTTON WITH SERIES 16 & 26 SNAP SWITCHES

These rugged panel sealed pushbuttons employ the workhorse basic switches for high (or low) current applications. The pushbuttons are available with square or round bezels. These switches are ideal for harsh environments.

#### APPLICATIONS

- Environmentally demanding keypads
- Mass transport controls
- Communications
- Instrumentation
- Data processing
- Military environments

#### KEY FEATURES:

- Panel sealed to IP67
- Momentary action
- Solder terminals
- Flame retardant UL rated material
- Life (min.) – 1,000,000 cycles
- Available with Series 16 or 26 switch
- Rated up to 10 amps



ACTUAL SIZE

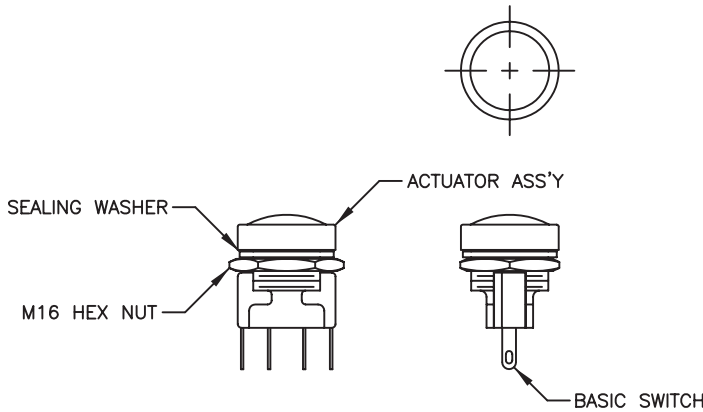
#### ORDERING INFORMATION:

Part Number	Button Style	Button Color	Circuit	Contact Material
<b>49-5911 / 530004</b>	Round	Black	SPDT-DB	Silver
<b>49-5912 / 530004</b>	Round	Red	SPDT-DB	Silver
<b>49-5913 / 530004</b>	Round	Green	SPDT-DB	Silver
<b>49-5911 / 810</b>	Round	Black	DPDT-DB	Enhanced Gold
<b>49-5912 / 810</b>	Round	Red	DPDT-DB	Enhanced Gold
<b>49-5913 / 810</b>	Round	Green	DPDT-DB	Enhanced Gold

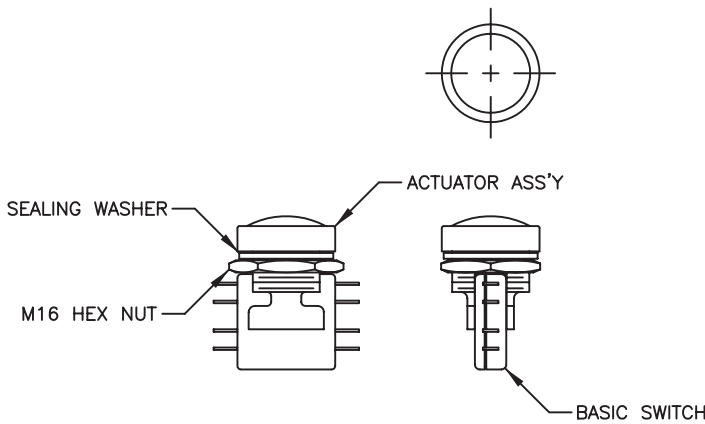
#### STANDARDS / AGENCY / RATINGS:



49-591x / 530004



49-591x / 810



Current rating: 26-810

Load	Sea Level				70,000 Ft.	
	28 VDC DPDT	28 VDC 4 CKT	115 VAC 60 HZ DPDT	115 VAC 60 HZ 4 CKT	28 VDC DPDT	28 VDC 4 CKT
Resistive	8 amp	8 amp	6 amp	4 amp	8 amp	8 amp
Inductive	6 amp	4 amp	4 amp	4 amp	2 amp	1 amp
Lamp	0.5 amp	0.5 amp	2 amp	1 amp	—	—

INSTALLATION:

The actuator assembly is installed from the front of the panel and locked down with the hex nut using a 20mm spanner. To attain the correct sealing, the nut should be tightened to a recommended torque of between 1.106 pound/foot (1.5 Nm) not exceeding 1.475 pound/foot (2 Nm). The basic switch can then be snapped into place from the back of the panel. Panel Thickness (Max): .118 (3.0).

MECHANICAL / ELECTRICAL CHARACTERISTICS:

Travel (nom):

0.09 inches / 2.3 mm

Operating force (nom):

387g–561g (3.8N–5.5N)

Dielectric strength:

1,000 VAC for 1 minute

Insulation resistance:

1 GΩ @ 500 VDC

Contact resistance initial:

25 mΩ max.

Electrical Life:

50,000 cycles @ 158°F (70°C)

Current rating 16-530004:

Form X or Y: 10 amps 125 VAC;

10 amps 28 VDC IND.

Form Z: 5 amps 125/250 VAC;

3 amps 28 VDC IND.

Current rating 26-810:

See chart on left

Operating temperature:

-67°F to +221°F

(-55°C to +105°C)

Body/Button material:

PBT

Contacts 16-530004:

silver

Contacts 26-810

enhanced gold

## MINIATURE VANDAL RESISTANT SEALED

This rugged miniature, momentary action, sealed switch series is ideal for a variety of applications in harsh environments where durability is key. It is panel sealed to IP67 and designed to be impact resistant.

### APPLICATIONS

- Military / Aerospace
- Process Controls
- Security Access Controls
- Medical Instrumentation
- Computers
- Transportation: Mass-transit, Marine, Lift Trucks, Personal and Recreational Vehicles, Rail

### KEY FEATURES:

- Panel sealed to IP67
- Momentary action
- Impact resistant
- Non-spark material
- Lighted and non-lighted versions
- Wide temperature range: -40°C to +125°C
- Gold Plated Palladium Nickel contacts



ACTUAL SIZE

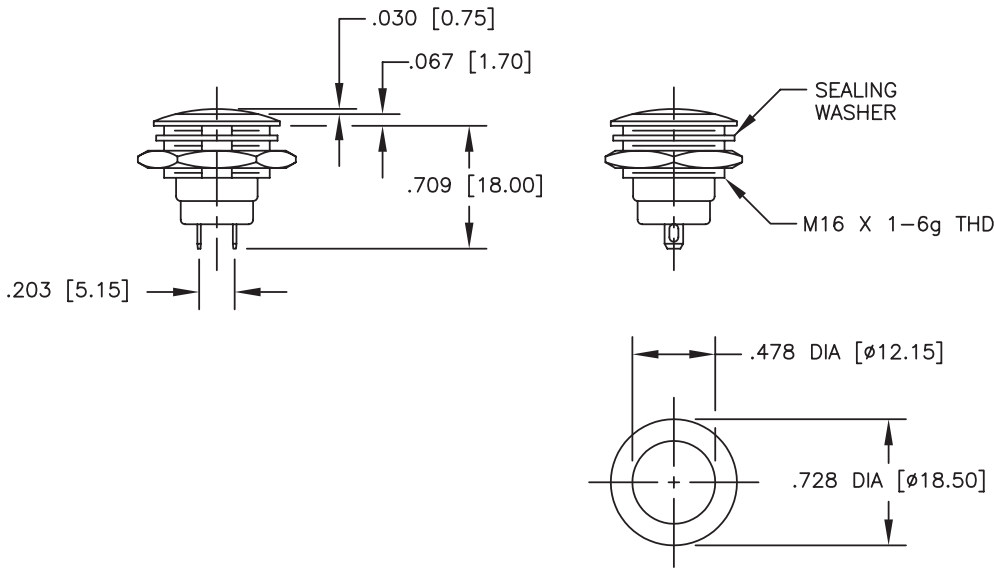
### ORDERING INFORMATION:

Part Number	Lighted	LED Color
<b>57-111</b>	No	—
<b>57-112B</b>	Yes	Blue
<b>57-112G</b>	Yes	Green
<b>57-112R</b>	Yes	Red

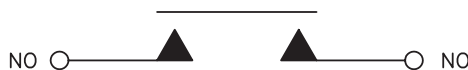
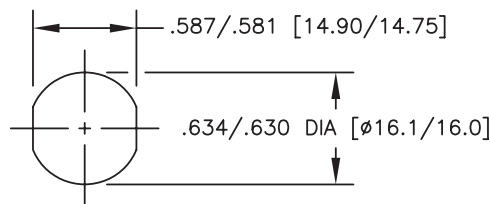
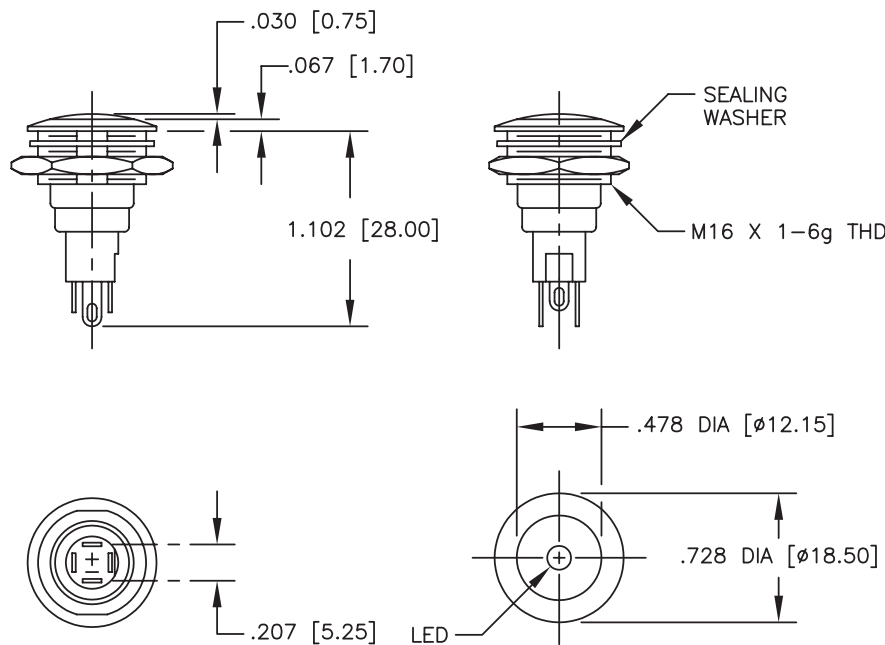
### STANDARDS / AGENCY / RATINGS:



**NON-LIGHTED**



**LIGHTED**



**MECHANICAL / ELECTRICAL CHARACTERISTICS:**

**Travel (nom):**

0.09 inches / 2.3 mm

**Life (nominal):**

1,000,000 cycles (mechanical)  
500,000 cycles (electrical)

**Operating force (nom):**

3N / 306 grams

**Contact bounce (nom):**

1 millisecond

**Panel thickness (max):**

0.118 inches / 3.0 mm

**Contact resistance initial:**

50 mΩ (Max)

**Current Rating (typical):**

400mA at 32 VAC resistive  
100mA at 50 VDC resistive  
125mA at 125 VAC resistive

**Switching power (max):**

16VA AC

**Shock:**

100g

**Body and button material:**

Velour chrome plated  
zinc alloy

**Terminals:**

gold plated brass

**Soldering information:**

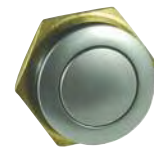
608°F (320°C) max for 3s



## Series 57M-EM

### MINIATURE PANEL SEALED METAL

The 57M is a miniature switch designed for rugged environments. The housing is zinc alloy with velour chrome plating. It is available as maintained or momentary action, Electro-mechanical operation with Gold plated contacts and solder terminals. It is ideal for a multitude of applications.



ACTUAL SIZE

### APPLICATIONS

- Security Equipment
- Industrial Control
- Medical Equipment
- Military Equipment
- Food Processing
- Transportation
- Computers

### KEY FEATURES:

- Zinc Alloy/Velour Chrome Plated
- Center Spot LED and Non-Lighted Versions
- Maintained or Momentary Action
- Panel Sealed to IP67
- RoHS Compliant
- Electro-Mechanical
- Gold Plated Contacts and Terminals

### ORDERING INFORMATION:

#### SWITCH FUNCTION:

1. MECHANICAL, MOMENTARY, SOLDER TERMINAL
2. MECHANICAL, MAINTAINED, SOLDER TERMINAL
5. MECHANICAL, MOMENTARY, PC TERMINAL
6. MECHANICAL, MAINTAINED, PC TERMINAL
- A. MECHANICAL, MOMENTARY, WIRE LEADS
- B. MECHANICAL, MAINTAINED, WIRE LEADS
9. SPECIAL, DIGITS ARE IN SERIAL ORDER

#### HOUSING MATERIAL:

1. ZINC ALLOY, VELOUR CHROME PLATED
2. ZINC ALLOY, MIRROR BLACK

#### ILLUMINATION:

0. NON-LIT
1. CENTER SPOT ILLUMINATION
2. RING ILLUMINATION
3. STANBY LOGO ILLUMINATION

#### LED COLOR:

- N. NONE
- G. GREEN L.E.D.
- R. RED L.E.D.
- A. AMBER L.E.D.
- B. BLUE L.E.D.
- W. WHITE L.E.D.

#### VOLTAGE RESISTOR

- IF BLANK \*
- 05 5V FORWARD

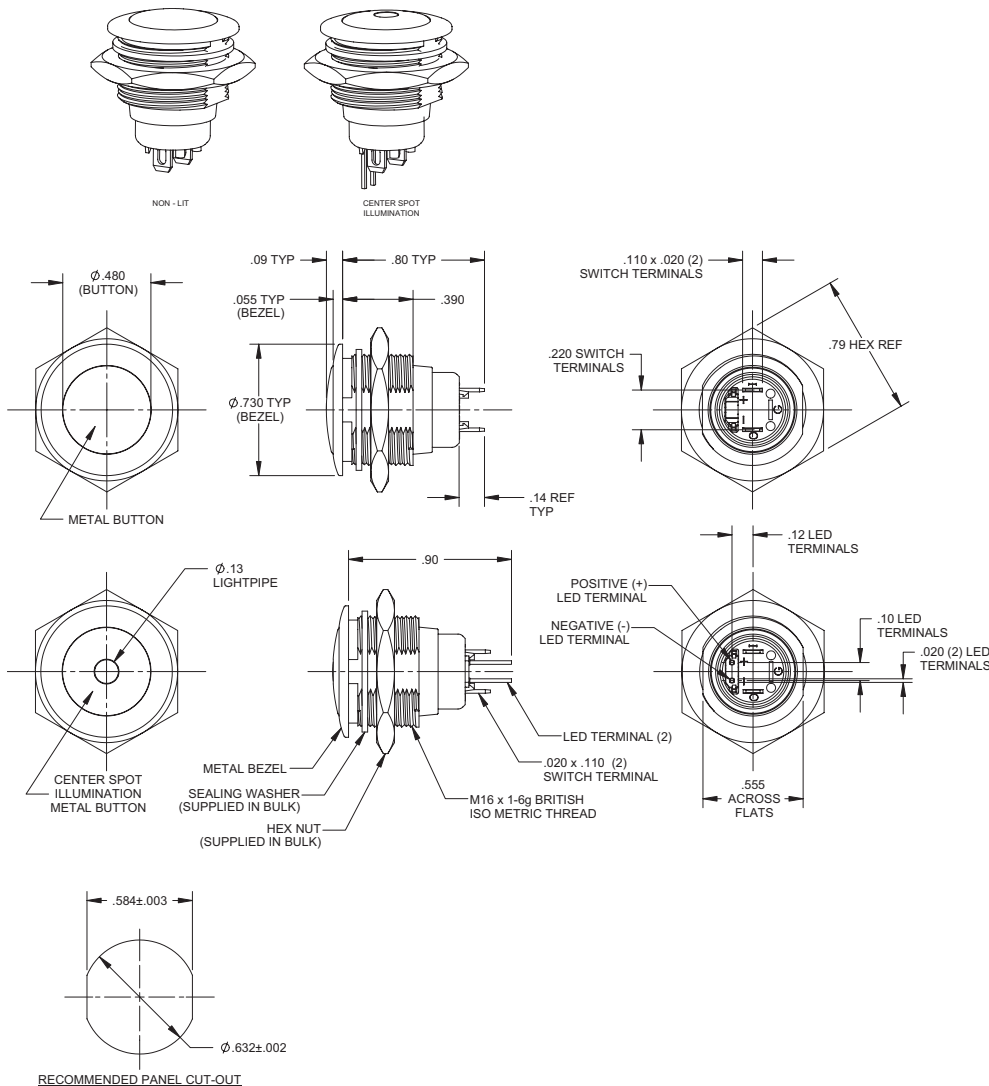
57M-

\* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

### STANDARDS / AGENCY / RATINGS:



## PRODUCT DRAWINGS



## MECHANICAL / ELECTRICAL CHARACTERISTICS:

### Circuit:

SPST-NO-DB

### Button travel (nominal):

0.09 inches / 2.3 mm

### Operating force (nominal):

3N / 306g

### Contact bounce (nominal):

1 millisecond

### Panel thickness:

0.20 – 0.120 inches /  
0.5 – 3mm

### Temperature index:

-40°C to + 85°C

### Torque (max):

10 inch pounds

### LED operating temperature:

-13° F to +185° F /  
-25° C to +85° C

### Current ratings (resistive):

250mA @ 12VDC, 100K cycles  
150mA @ 28VDC, 150K cycles  
(momentary)  
100mA @ 48VDC, 100K cycles  
10mA @ 12VDC, 1 million cycles  
(momentary)

## ELECTRO-MECHANICAL

### Dielectric strength:

1,000 VAC

### Insulation resistance:

1 GΩ

### Contact resistance:

50 mΩ max (initial)

## PANEL MOUNTING AND CONSTRUCTION INFORMATION

The series 57M mounts easily into panels of minimum 0.20" (0.5mm) and maximum 0.120" (3mm) thicknesses. Front panel sealing to IP67 is achieved by a sealing washer which is fitted to the body of the switch before it is inserted into the panel hole cutout. It is held onto the panel by means of a metal hex nut tightened down to a torque of 10 inch pounds to achieve the correct sealing pressure.

## Series 57M-SS

### MINIATURE PANEL SEALED METAL

The 57M is a miniature switch designed for rugged environments. The housing is zinc alloy with velour chrome plating. It is available as maintained or momentary action, solid-state operation with Gold plated contacts and solder terminals. It is ideal for a multitude of applications.



ACTUAL SIZE

### APPLICATIONS

- Security Equipment
- Industrial Control
- Medical Equipment
- Military Equipment
- Food Processing
- Transportation
- Computers

### KEY FEATURES:

- Zinc Alloy/Velour Chrome Plated
- Center Spot LED and Non-Lighted Versions
- Maintained or Momentary Action
- Panel Sealed to IP67
- RoHS Compliant
- Solid State
- Gold Plated Contacts and Terminals

### ORDERING INFORMATION:

#### SWITCH FUNCTION:

3. SOLID STATE, MOMENTARY, SOLDER TERMINAL
4. SOLID STATE, MAINTAINED, SOLDER TERMINAL
7. SOLID STATE, MOMENTARY, PC TERMINAL
8. SOLID STATE, MAINTAINED, PC TERMINAL
- C. SOLID STATE, , MOMENTARY, WIRE LEADS
- D. SOLID STATE, , MAINTAINED, WIRE LEADS
9. SPECIAL, DIGITS ARE IN SERIAL ORDER

#### HOUSING MATERIAL:

1. ZINC ALLOY, VELOUR CHROME PLATED
2. ZINC ALLOY, MIRROR BLACK

#### BUTTON STYLE:

0. NON-LIT
1. CENTER SPOT ILLUMINATION
2. RING ILLUMINATION
3. STANBY LOGO ILLUMINATION

#### LED COLOR:

- N. NONE
- G. GREEN L.E.D.
- R. RED L.E.D.
- A. AMBER L.E.D.
- B. BLUE L.E.D.
- W. WHITE L.E.D.

#### VOLTAGE RESISTOR

- IF BLANK \*
- 05 5V FORWARD

57M-

\* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

### STANDARDS / AGENCY / RATINGS:







## Series 58M-EM

### FULLY SEALED METAL PUSHBUTTON WITH WIRE LEADS

Built on the proven series 48 platform these rugged switches come in stainless steel or aluminum housings, electro-mechanical with either momentary or maintained action and lighted or unlighted versions. The variety of options in this compact package size make the 58M ideal for many applications: transportation, outdoor controls, security products, food processing and medical products.



ACTUAL SIZE

### APPLICATIONS

- Outdoor Controls
- Kiosks
- Security Equipment
- Medical Equipment
- Food Processing Equipment
- Military Equipment
- Industrial Machinery
- Transportation: Mass-Transit, Lift Trucks

### KEY FEATURES:

- Momentary or Maintained Action
- Stainless Steel or Aluminum Housing
- Non Lit or Ring Illumination
- Variety of LED colors
- Electro-Mechanical
- Panel Sealed to IP67
- ROHS Compliant
- Gold Plated Contacts

### ORDERING INFORMATION:

SWITCH FUNCTION:	HOUSING MATERIAL:	BUTTON STYLE:	LED COLOR:	VOLTAGE RESISTOR
<b>A.</b> MECHANICAL, MOMENTARY, WIRE LEADS	<b>1.</b> STAINLESS STEEL	<b>0.</b> NON-LIT	<b>N.</b> NONE	IF BLANK *
<b>B.</b> MECHANICAL, MAINTAINED, WIRE LEADS	<b>2.</b> ALUMINUM	<b>2.</b> RING ILLUMINATION	<b>G.</b> GREEN	<b>05</b> 5V FORWARD
		<b>R.</b> RED, NON-LIT	<b>R.</b> RED	<b>12</b> 12V FORWARD
			<b>B.</b> BLUE	<b>24</b> 24V FORWARD
			<b>W.</b> WHITE	
			<b>RB.</b> RED / BLUE	
			<b>RG.</b> RED / GREEN	
			<b>BG.</b> BLUE / GREEN	

**58M-** [ ] [ ] [ ] [ ] [ ]

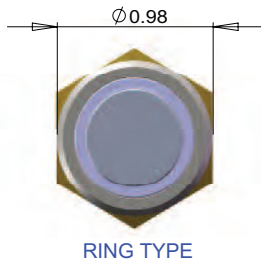
\* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

### STANDARDS / AGENCY / RATINGS:

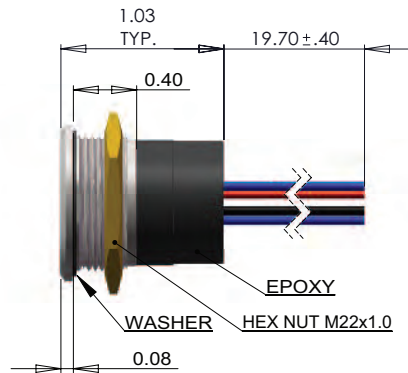


## PRODUCT DRAWINGS

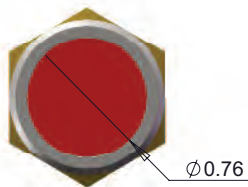
### ILLUMINATION



RING TYPE



### NON-ILLUMINATION

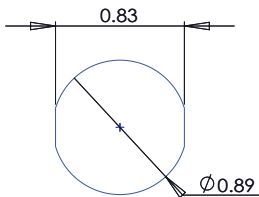


COLORLED TYPE



NON.-LIT. TYPE

### RECOMMENDED PANEL CUTOUT



### WIRELEADS DESCRIPTION

WIRELEADS TYPE	WIRELEADS SPECIFICATION	SW TERMINAL		LED	
		I	O	+	-
ILLUMINATION	AWG26/UL1007	BLUE	BLUE	RED	BLACK
NON-ILLUMINATION		BLUE	BLUE	---	---

## MECHANICAL / ELECTRICAL CHARACTERISTICS:

### Circuit:

SPST-NO-DB (Form X)

### Button travel (nominal):

0.09 inches / 2.3 mm

### Operating force (nominal):

3N / 306 grams

### Contact bounce (nominal):

1 millisecond

### Panel thickness:

0.50" – 0.150" (1.3 – 3.8mm)

### Temperature index:

-40°C to +85°C

### Torque (max):

10 inch pounds

### LED operating temperature:

-13° F to +185° F /

-25° C to +85° C

### Current ratings (resistive):

250mA @ 12VDC, 100K cycles

150mA @ 28VDC, 150K cycles (momentary)

100mA @ 48VDC, 100K cycles

10mA @ 12VDC, 1 million cycles (momentary)

## ELECTRO-MECHANICAL

### Dielectric strength:

1,000 VAC

### Insulation resistance:

1 GΩ

### Contact resistance:

50 mΩ max (initial)

## PANEL MOUNTING AND CONSTRUCTION INFORMATION

The series 58M mounts easily into panels of minimum 0.50" (1.3 mm) and maximum 0.150" (3.8 mm) thickness. Front panel sealing to IP67 is achieved by a sealing o-ring fitted to the body of the switch before it is inserted into the panel hole cut-out. It is held onto the panel by means of a metal hex nut tightened down to a torque of 10 inch pounds to achieve the correct sealing pressure.

## Series 58M-SS

### FULLY SEALED METAL PUSHBUTTON WITH WIRE LEADS

Built on the proven series 48 platform these rugged switches come in stainless steel or aluminum housings, solid state with either momentary or maintained action and lighted or unlighted versions. The variety of options in this compact package size make the 58M ideal for many applications: transportation, outdoor controls, security products, food processing and medical products.



ACTUAL SIZE

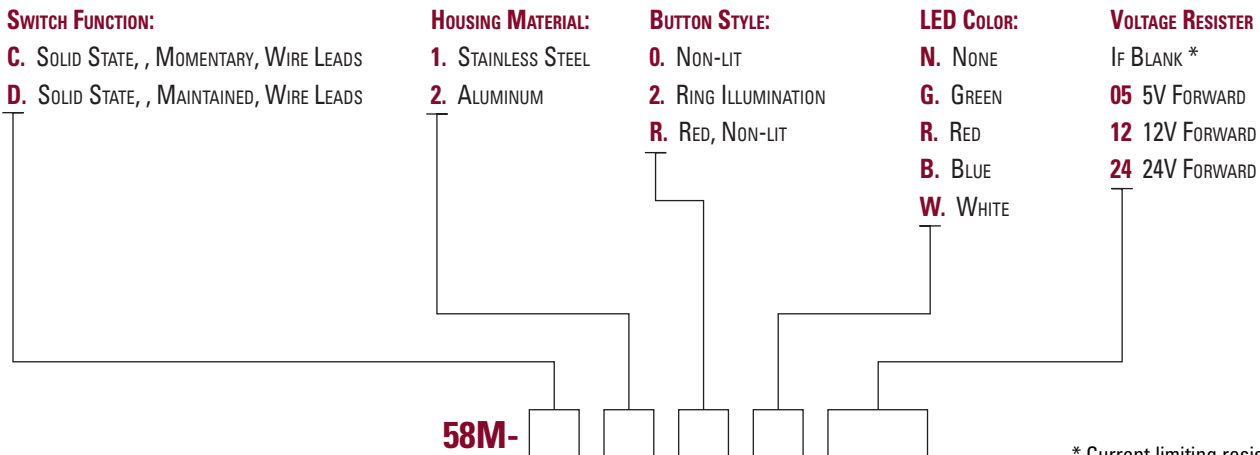
### APPLICATIONS

- Outdoor Controls
- Kiosks
- Security Equipment
- Medical Equipment
- Food Processing Equipment
- Military Equipment
- Industrial Machinery
- Transportation: Mass-Transit, Lift Trucks

### KEY FEATURES:

- Momentary or Maintained Action
- Solid State
- Stainless Steel or Aluminum Housing
- Panel Sealed to IP67
- Non Lit or Ring Illumination
- ROHS Compliant
- Variety of LED colors
- Gold Plated Contacts

### ORDERING INFORMATION:



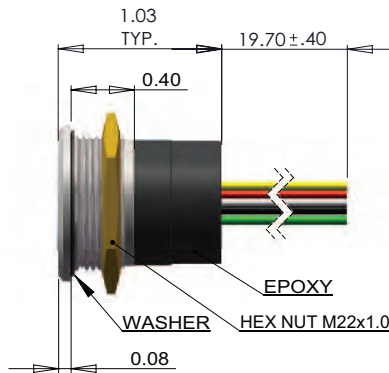
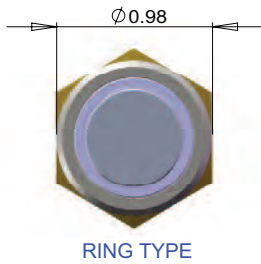
\* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

### STANDARDS / AGENCY / RATINGS:

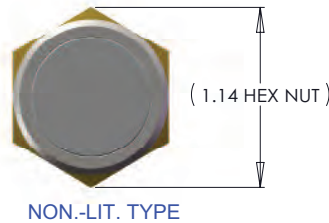
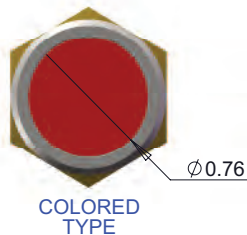


## PRODUCT DRAWINGS

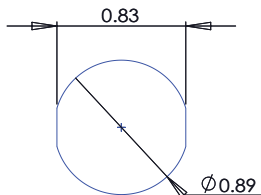
### ILLUMINATION



### NON-ILLUMINATION



### RECOMMENDED PANEL CUTOUT



### WIRELEADS DESCRIPTION

WIRELEADS TYPE	WIRELEADS SPECIFICATION	SW TERMINAL			LED	
		I	O	G	+	-
ILLUMINATION	AWG26/UL1007	YELLOW	GREEN	WHITE	RED	BLACK
NON-ILLUMINATION		YELLOW	GREEN	WHITE	---	---

## MECHANICAL / ELECTRICAL CHARACTERISTICS:

### Circuit:

SPST-NO-DB (Form X)

### Button travel (nominal):

0.09 inches / 2.3 mm

### Life (mechanical) (nominal):

1,000,000 cycles (momentary)

100,000 cycles (maintained)

### Operating force (nominal):

3N / 306 grams

### Panel thickness:

0.02 – 0.12 inches / 0.5 – 3mm

### Temperature index:

-40°F to + 185°F

### Supply voltage:

4.2V to 24V, 26.5V Max.

### Supply current:

B < B<sub>rp</sub>, V<sub>cc</sub>=12V: 3mA Typ.

To 8mA Max.

B > B<sub>op</sub>, V<sub>cc</sub>=12V: 4mA Typ.

To 8mA Max.

### Output current:

20 mA

### Reverse battery voltage:

-30V Max.

### Reverse output current:

-50mA Max.

### Torque (max):

10 inch pounds

## PANEL MOUNTING AND CONSTRUCTION INFORMATION

The series 58M mounts easily into panels of minimum 0.50" (1.3 mm) and maximum 0.150" (3.8 mm) thickness. Front panel sealing to IP67 is achieved by a sealing o-ring fitted to the body of the switch before it is inserted into the panel hole cut-out. It is held onto the panel by means of a metal hex nut tightened down to a torque of 10 inch pounds to achieve the correct sealing pressure.



## MINIATURE METAL PANEL SEALED PUSHBUTTON

This rugged panel sealed pushbutton is made of a special high creep strength non-spark zinc alloy suitable for use in mining or other potentially explosive atmospheres where dust and moisture are problematic.

# Series 59



ACTUAL SIZE

## APPLICATIONS

- Communications
- Instrumentation
- Data processing
- Process controls
- Transportation/ Material handling

## KEY FEATURES:

- Panel sealed to IP67
- Momentary action
- Non-spark material
- 500,000 life cycles @ max power
- Impact resistant
- Gold contacts
- Wide temperature range:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$

## ORDERING INFORMATION:

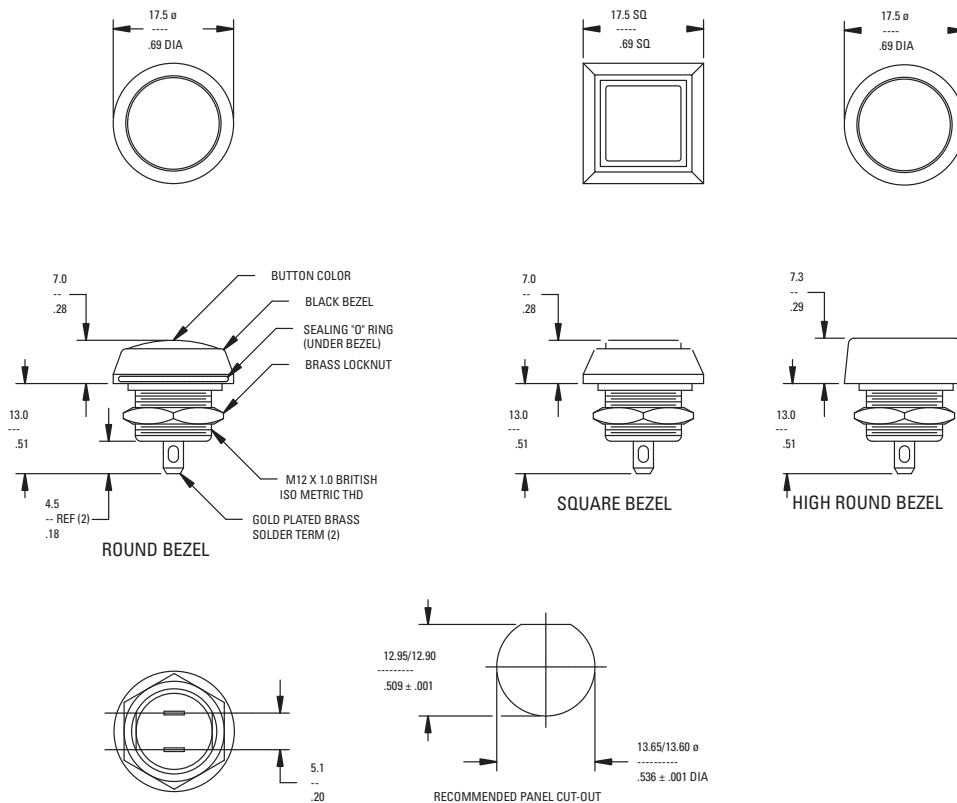
Part Number	Bezel Style	Button Color*
59-111	Round	Black
59-112	Round	Red
59-113	Round	Green
59-211	Square	Black
59-212	Square	Red
59-213	Square	Green
59-311	High Round	Black
59-312	High Round	Red
59-313	High Round	Green

\*Consult factory for additional colors.

## STANDARDS / AGENCY / RATINGS:



PRODUCT DRAWINGS



PANEL MOUNTING AND CONSTRUCTION INFORMATION

The series 59 mounts easily into panels of minimum 1.5mm (.060 in.) and maximum 3mm (.118 in.) thickness. Front panel sealing to IP67 is achieved by a sealing "O" ring fitted into a premachined groove on the body of the switch before it is inserted into the panel hole cut-out. It is held onto the panel by means of a metal hex nut tightened down by a 14mm spanner, to a torque of between 1.5Nm to 3.0Nm to achieve the correct sealing pressure. A "D" flat is provided to prevent rotation.

MECHANICAL / ELECTRICAL CHARACTERISTICS:

- Travel (nom):**  
2.3mm (.090 in.)
- Life (max):**  
1,000,000 cycles
- Operating force (nom):**  
3N / 306 grams
- Contact bounce (nom):**  
1 millisecond
- Panel thickness (max):**  
3mm (.118 in.)
- Dielectric strength:**  
1000 VAC
- Insulation resistance:**  
1 GΩ
- Contact resistance (initial):**  
50 mΩ (Max)
- Current rating (typical):**  
400mA at 32 VAC resistive  
100mA at 50 VDC resistive  
125mA at 125 VAC resistive
- Shock:**  
100G
- Operating temp range:**  
-55°C to +125°C  
(-67°F to +257°F)
- Body material:**  
zinc alloy, black
- Button material:**  
PBT thermoplastic
- Contacts:**  
gold plated palladium nickel
- Terminals:**  
gold plated brass

## Series 76-59

### EXTRA TOUGH VANDAL RESISTANT SEALED PUSHBUTTON SWITCH

The Series 76-59 is an extra tough, stainless steel sealed pushbutton. It is made to withstand rough use and the concave stainless button makes it ADA compatible. The switch is momentary action and the button is available in a stainless or red powder coated button.



ACTUAL SIZE

### APPLICATIONS

- Security systems
- Kiosks
- Process control
- Public access equipment
- Gas pumps
- Outdoor machinery
- Industrial machinery

### KEY FEATURES:

- Sealed to IP67
- SPST-NO-DB
- Stainless steel body and button
- .110 quick connect terminals
- Standard ITW Pancon connector available
- Extra ruggedized construction
- ADA compatible

### ORDERING INFORMATION:

Part Number	Bushing	Button
<b>76-59200</b>	Stainless steel	Raised concave stainless steel
<b>76-59300</b>	Stainless steel	Raised concave brass with UV stabilized red powder coat finish

### STANDARDS / AGENCY / RATINGS:



76-59200 & 76-59300

**MECHANICAL / ELECTRICAL CHARACTERISTICS:**

**Electrical rating:**

100 mA max @  
50 VDC Resistive

**Life (electrical):**

500,000 cycles @ max load

**Operating force:**

3.0 N ref

**Operating temperature:**

-55°C to +125°C

**Bushing material:**

stainless steel

**Button material:**

stainless steel (76-59200) or  
brass with UV stabilized red  
powder coat finish (76-59300)

**Contacts & terminals:**

gold plated brass

**Switch terminals mate with**

**ITW Pancon Connector  
CSF-MH-0202**

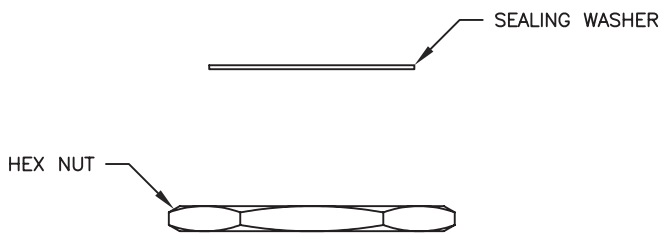
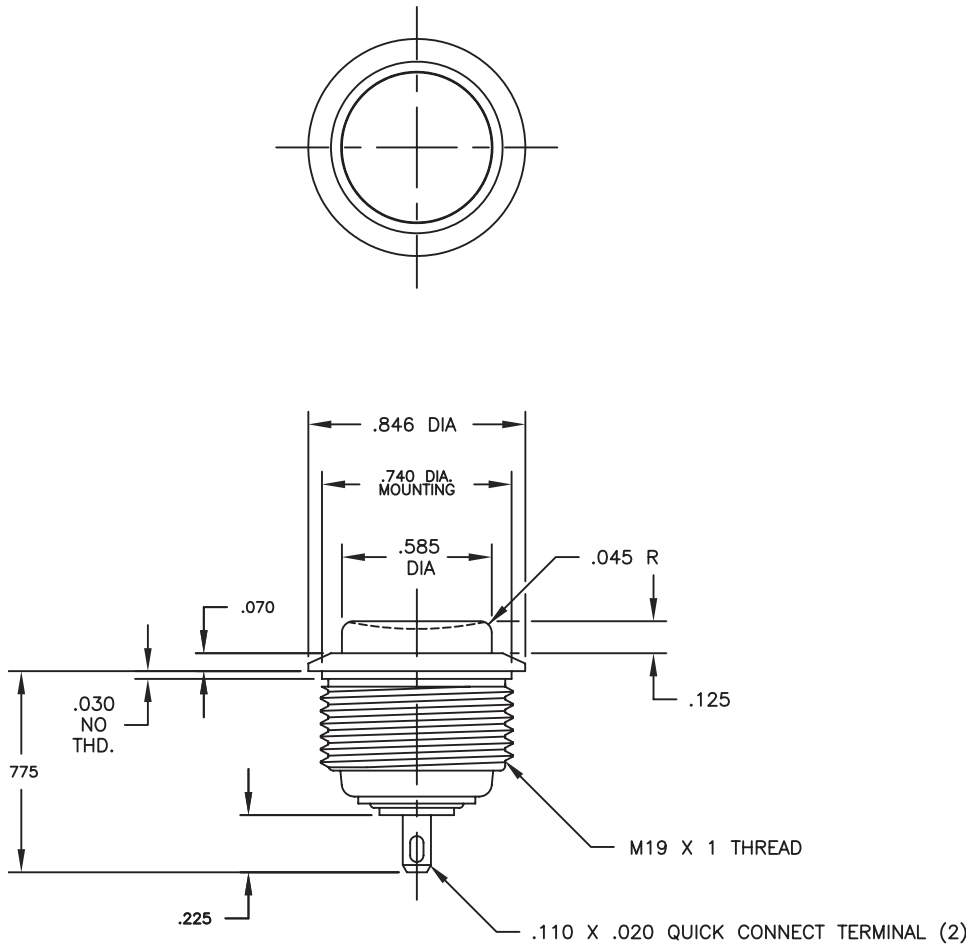
**Recommended panel cutout:**

0.758 inch diameter

**Recommended panel**

**thickness:**

0.06 – 0.31 inches





## Series 76-95

### 10 AMP VANDAL RESISTANT PUSHBUTTON SWITCHES

This rugged panel sealed switch is designed to withstand impacts of significant force. Using Series 16 and 26 Butterfly® snap action switches loads of up to 10.1 amps can be switched. The low profile makes it difficult to pry the switch from its mounting.



ACTUAL SIZE

### APPLICATIONS

- Military/Aerospace
- Industrial: welding, motors, pumps, controls, valves
- Transportation: mass transit, marine, lift trucks, personal and recreational vehicles, rail
- Security access controls
- Elevators

### KEY FEATURES:

- Panel sealed to IP67
- Form Z switch contacts
- Wide temperature range: -30°C to +105°C (-22°F to +221°F)
- UL recognized (16-530004 & 26-810 only) and CSA certified
- Solder Terminals
- Life: 50,000 cycles at full load

### ORDERING INFORMATION:

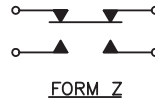
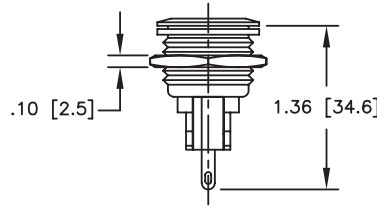
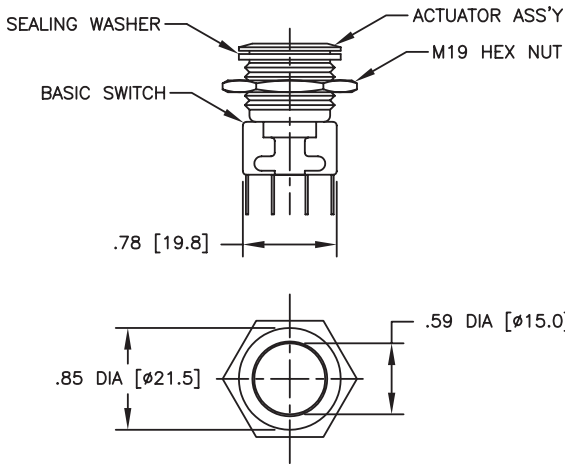
Part Number*	Contacts	Circuit
<b>76-9510/530004</b>	Silver	SPDT-DB
<b>76-9510/810</b>	Enhanced Gold	DPDT-DB

\* Switches are individually packaged with one each: actuator assembly, basic switch, sealing washer, and hex nut per bag.

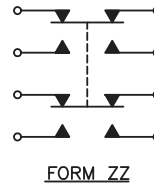
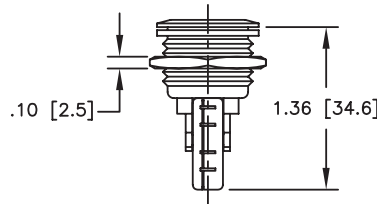
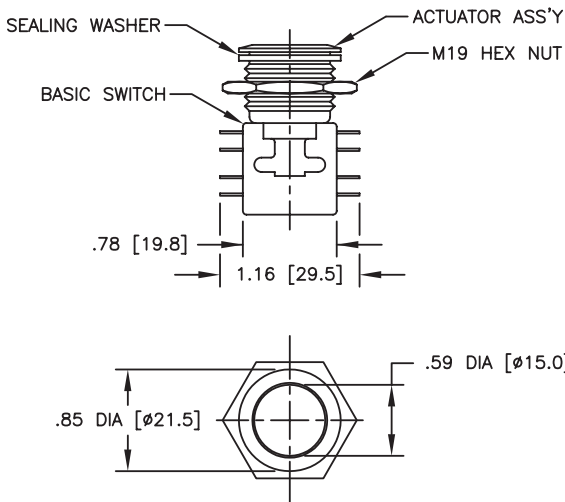
### STANDARDS / AGENCY / RATINGS:



76-9510/530004



76-9510/810



Current rating, 26-810:

Load	Sea Level				70,000 Ft.	
	28 VDC DPDT	28 VDC 4 CKT	115 VAC 60 HZ DPDT	115 VAC 60 HZ 4 CKT	28 VDC DPDT	28 VDC 4 CKT
Resistive	8 amp	8 amp	6 amp	4 amp	8 amp	8 amp
Inductive	6 amp	4 amp	4 amp	4 amp	2 amp	1 amp
Lamp	0.5 amp	0.5 amp	2 amp	1 amp	—	—

MECHANICAL / ELECTRICAL CHARACTERISTICS:

**Mechanical Life:**

1,000,000 cycles

**Operating force:**

2.6N / 265 grams

**Panel thickness:**

0.06 – 0.31 inches / 1.5 – 8mm

**Panel cut out:**

0.758 inch Diameter /  
19.25mm

**Dielectric strength:**

1,000 VAC for 1 minute

**Insulation resistance:**

1 GΩ @ 500VDC

**Contact resistance initial:**

25 mΩ max

**Current rating, 16-530004:**

Form X or Y: 10 amps 125 VAC;  
10 amps 28 VDC Ind.

Form Z: 5 amps 125/250 VAC;  
3 amps 28 VDC Ind.

**Current rating, 26-810:**

see chart on left

**Electrical:**

Life: 50,000 cycles (max load)  
@ 158°F (70°C)

**Button and bezel material:**

stainless steel

**Contact material:**

16-530004: silver

**Contact material:**

26-810: enhanced gold

## PANEL SEALED PUSHBUTTON SWITCH

The Series 76-97 is robust. The switch body and button are made from hard-wearing plastic and produced in front mounting style. The 76-97 series is available as momentary or maintained action. In addition the buttons have a brightly colored switch indicator which gives an "at a glance" recognition of the mode currently in use. Buttons and status rings can be supplied in a variety of colors. The 76-97 utilizes ITW Switches' proven Series 16 snap action switch.

# Series 76-97



ACTUAL SIZE

### APPLICATIONS:

- Military environments
- Industrial machinery
- Mining equipment
- Petrochemical
- Process control
- Material handling

### KEY FEATURES:

- Wide temperature range: from -40°C to + 105°C
- Panel sealed to IP67
- Maintained and momentary action
- Solder terminals
- Status Indication

### ORDERING INFORMATION:

#### Switch

Part Number*	Switch Action	Number of Poles
76-9711/4044X	Momentary	1
76-9711/804X	Momentary	2
76-9712/4044X	Maintained	1
76-9712/804X	Maintained	2

\* X = Button/Identity Ring Color

#### Button

Button/Identity Ring Color	Add to Part Number
Black/Red	B
Red/Yellow	R
Green/Yellow	G
White/Yellow	W
Yellow/Red	Y
Blue/Red	N
Light Grey/Red	GY

### NON-STANDARD OPTIONS:

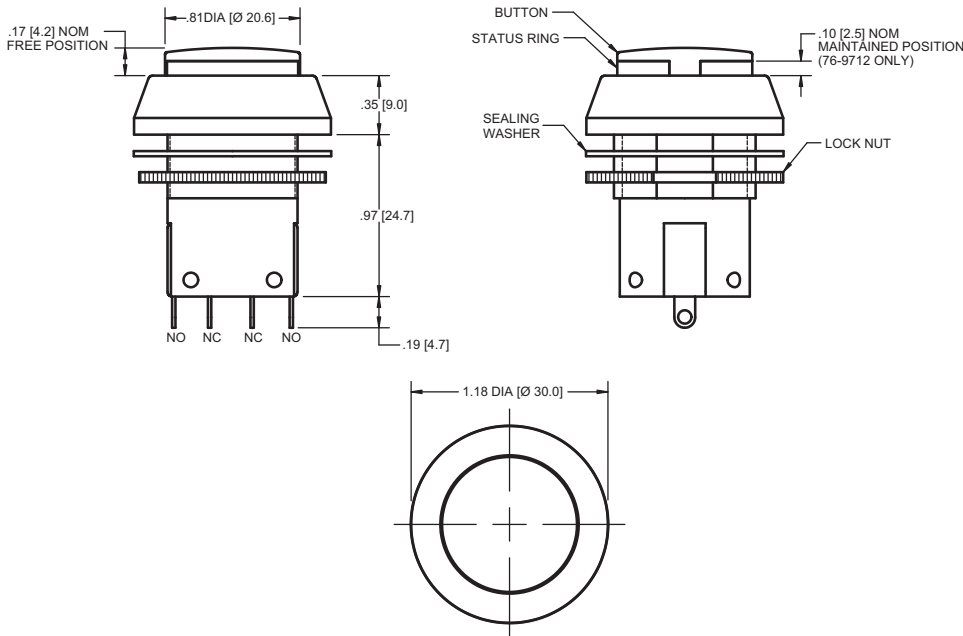
- PCB terminals
- Gold contacts
- 2 poles available
- Color variants
- Surface or sublimation legend printing

\*For non-standard options, please consult factory.

### STANDARDS / AGENCY / RATINGS:



## PRODUCT DRAWINGS



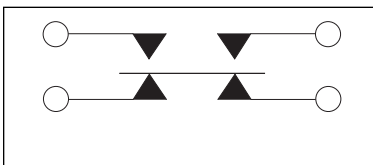
## PANEL MOUNTING AND CONSTRUCTION:

The 76-97 mounts easily into panels not exceeding .235" (6mm) thickness. Front panel sealing to IP67 is achieved by use of the sealing washer which is fitted to the switch before it is inserted into the panel hole cut out. It is held into the panel by means of a lock nut, tightened down to a torque of between 13 lb/in (1.5 Nm) to 25 lb/in (2.85 Nm) to achieve the correct sealing pressure. It is mounted into a standard .885" (22.5 mm) diameter and a double "D" flat is provided to prevent rotation if required (.800 between flats). Thread size —M2 x 1.5 ISO metric thread to British Standard 3643.

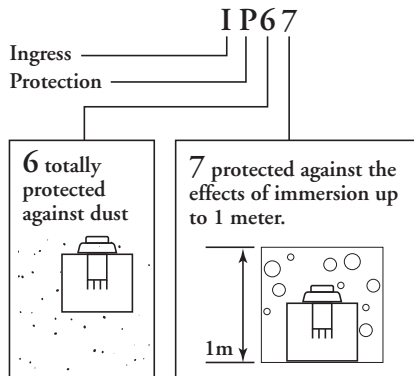
## MULTI-POLE INFORMATION:

The Series 76-97 has a non-standard option of 2 poles. The 2 pole switch is provided separate to the switch body and must be fitted, via a spring clip, after the switch body has been mounted in the panel.

## SWITCH CIRCUITRY:



## INGRESS PROTECTION:



## MECHANICAL / ELECTRICAL CHARACTERISTICS:

### Travel:

.14" (3.5 mm)

### Mechanical Life:

2,000,000 (Momentary)  
100,000 (Maintained)

### Operating force:

45 oz (12N) nominal

### Contact bounce:

5 milliseconds

### Panel thickness (max):

.235" (6 mm)

### Dielectric strength:

1000 VAC

### Insulation resistance:

1 GΩ

### Contact resistance (initial):

25 mΩ (Max)

### Current rating (max):

10A resistive 250 VAC

### Electrical Life:

100,000 cycles @ 20°C

### Ingress protection:

IP67

### Shock:

50g

### Operating temperature range:

-40°C to + 105°C

### Body / Actuator material:

PBT

### Contact material:

Fine silver

### Terminal material:

200 microseconds  
(5 microns) bright acid tin  
plate, nickel flash undercoat.

# ITW Switches

2550 Millbrook Drive, Buffalo Grove, IL 60089  
800.544.3354 • 847.876.9400 • 847.876.9440 (Fax)  
[www.itwswitches.com](http://www.itwswitches.com)



## INTERNATIONAL LOCATIONS

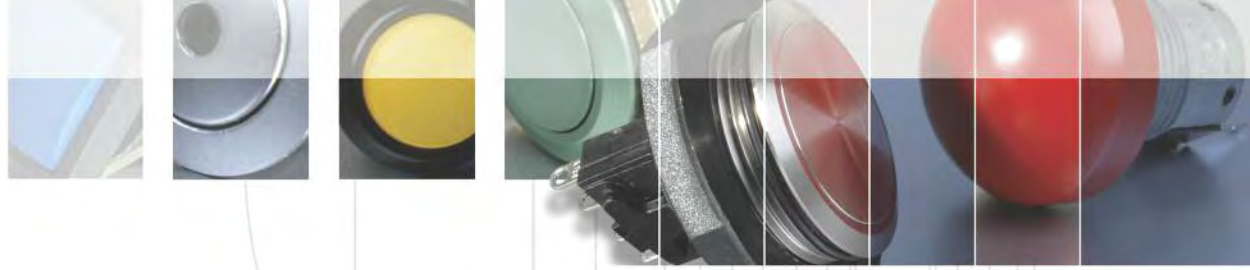
### ITW Electronic Business Asia Co., Limited

Box 26140  
A4-32 Kaohsiung Export Processing Zone  
Kaohsiung, Taiwan  
Republic of China  
886 (7) 811-9206 (Phone)  
886 (7) 811-1795 (Fax)  
[www.itwasia.com.tw](http://www.itwasia.com.tw)

### ITW Switches and Switch Panels

Norway Road  
Hilsea, Portsmouth, England PO3 5HT  
44 (0) 23 92 694971 (Phone)  
44 (0) 23 92 666352 (Fax)  
[www.itwswitches.co.uk](http://www.itwswitches.co.uk)





# ITW SWITCHES SNAP ACTION SWITCHES

Design, development and manufacture of switch solutions

 PUSH BUTTON

 SNAP ACTION

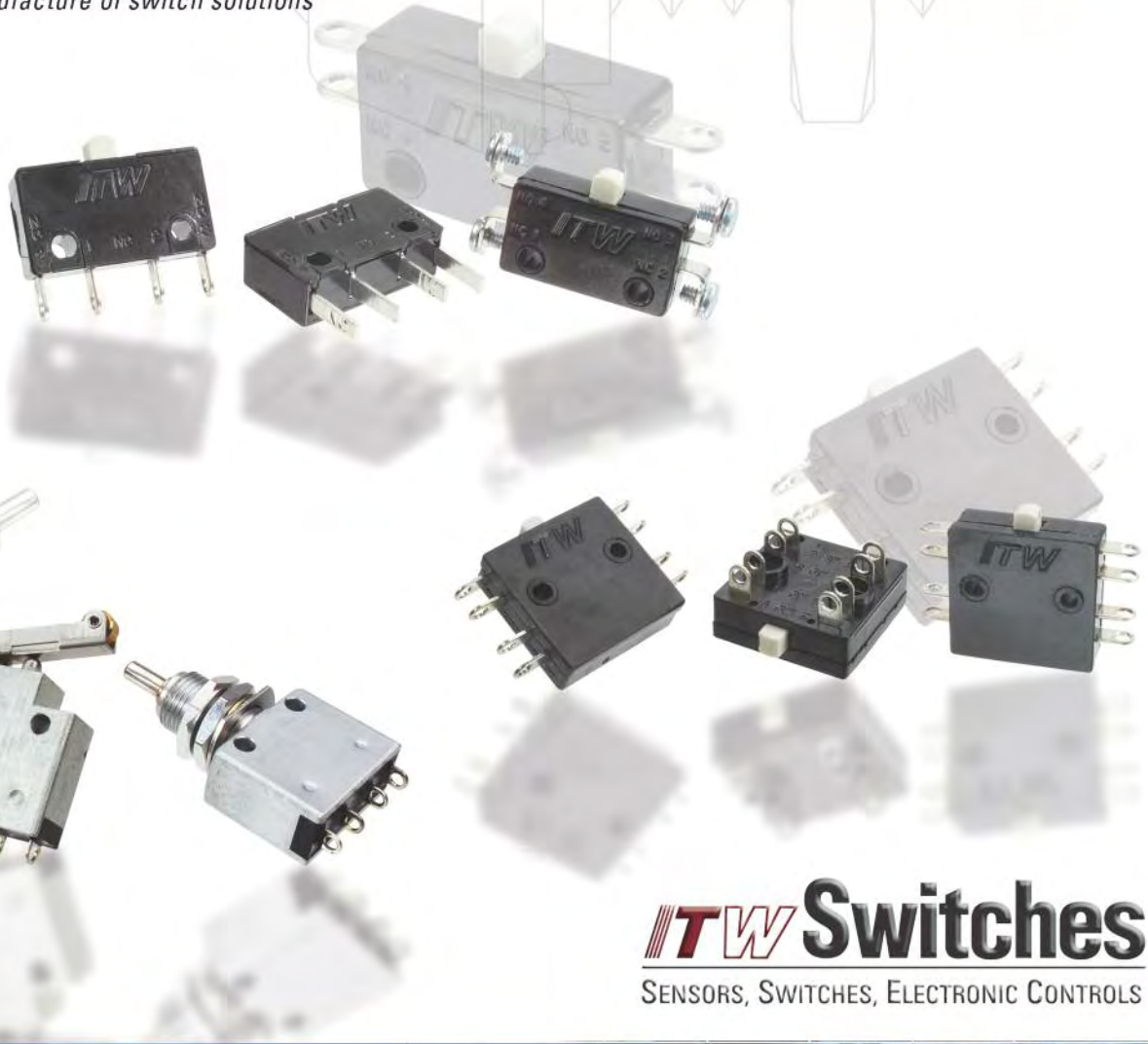
 ACTUATORS

 SLIDE

 ROTARY

 CUSTOM ASSEMBLIES

 MILITARY / AEROSPACE



**ITW Switches**

SENSORS, SWITCHES, ELECTRONIC CONTROLS



[WWW.ITWSWITCHES.COM](http://WWW.ITWSWITCHES.COM)








800.544.3354





# 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



[WWW.ITWSWITCHES.COM](http://WWW.ITWSWITCHES.COM)

800.544.335

# LICON — SNAP ACTION SWITCHES

<b>Table Of Contents</b> .....	<b>ii – iii</b>
<b>Series 11: Miniature 10 amp Double-Break</b> .....	<b>46 – 47</b>
<b>Series 14: Heavy Duty 20 amp Double-Break</b> .....	<b>48 – 49</b>
<b>Series 16: Sub-Miniature 10.1 amp Double-Break</b> .....	<b>50 – 51</b>
<b>Series KAP 16: Sub-Miniature 10.1 amp Double-Break</b> .....	<b>52 – 53</b>
<b>Series 18: Ultra Sub-Miniature 7 amp Double-Break</b> .....	<b>54 – 55</b>
<b>Series 19: 5-amp Sub-Miniature</b> .....	<b>56 – 57</b>
<b>Series 22: Miniature 10 amp Double-Pole</b> .....	<b>58 – 59</b>
<b>Series 26: Sub-Miniature 8 amp Double Pole</b> .....	<b>60 – 61</b>
<b>Series KAP 26: Sub-Miniature 8 amp</b> .....	<b>62 – 63</b>
<b>Series 65: Sealed 10 amp Sub-Miniature</b> .....	<b>64 – 65</b>
<b>Series 76-6: Door Interlock Switch</b> .....	<b>66 – 67</b>
<b>Actuators Series 11 (See Page 46 for Switches)</b> .....	<b>68</b>
<b>Actuators Series 16 (See Pages 50 &amp; 52 for Switches)</b> .....	<b>69</b>
<b>Actuators Series 18 (See Page 54 for Switches)</b> .....	<b>70</b>
<b>Actuators Series 22 (See Page 58 for Switches)</b> .....	<b>71</b>
<b>Actuators Series 26 (See Page 60 &amp; 62 for Switches)</b> .....	<b>72</b>



## 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

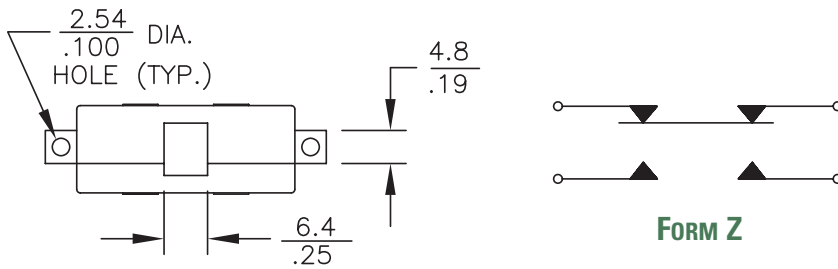
##### Actuators (see page 68 for additional specifications)

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

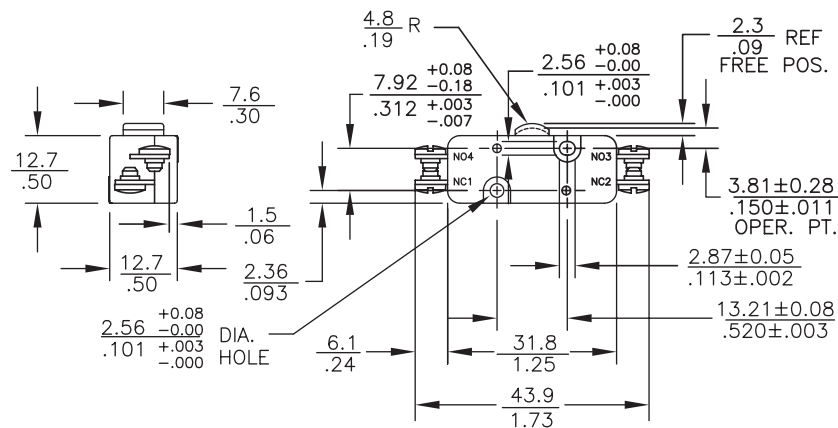
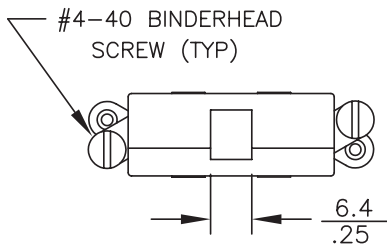
#### STANDARDS / AGENCY / RATINGS:



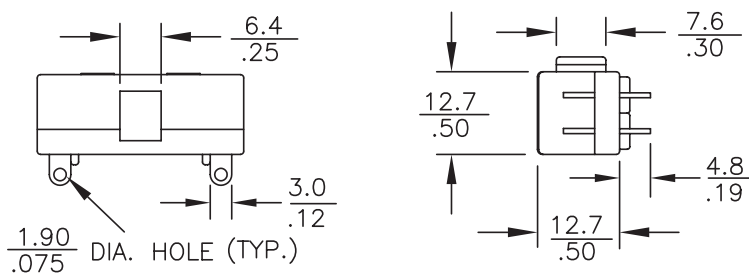
## END SOLDER



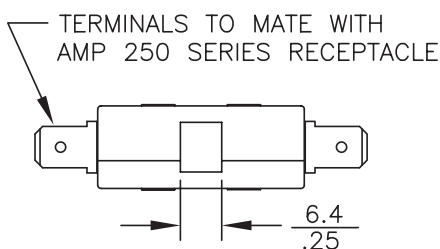
## # 4 SCREW



## 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 NC (Form Y) or NO (Form X)	10 amp (75-80% PF)	10 amp Ind
SPDT-DB (Form Z)	1/2 HP 125 VAC	15 amp Res
SPDT-SB (Form C)	3/4 HP 250 VAC	7 amp Ind 10 amp Res 4 amp Ind 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:

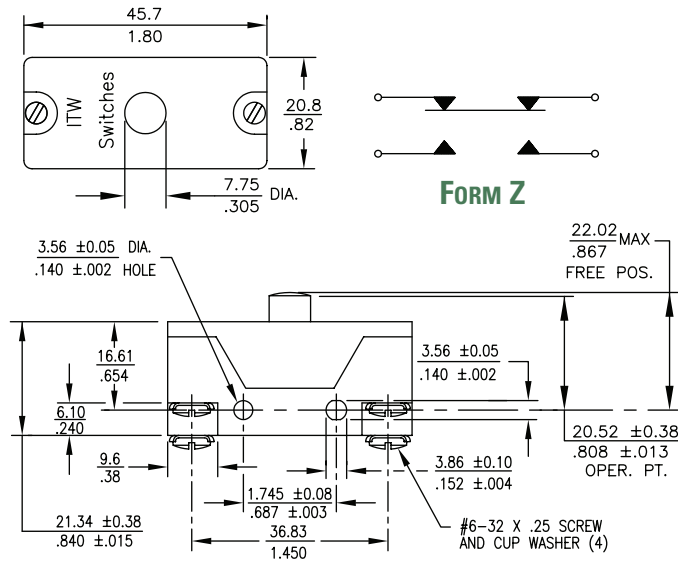
Circuitry	Volts	AC		DC	
		Steady	In-Rush	SPDT	SPST
SPDT-DB(Form Z)	28	20	80	10.0	25.0
SPDT-DB(Form Z)	125	20	80	—	—
SPDT-DB(Form Z)	250	20	80	—	—
SPDT-DB(Form Z)	480	20	50	—	—

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



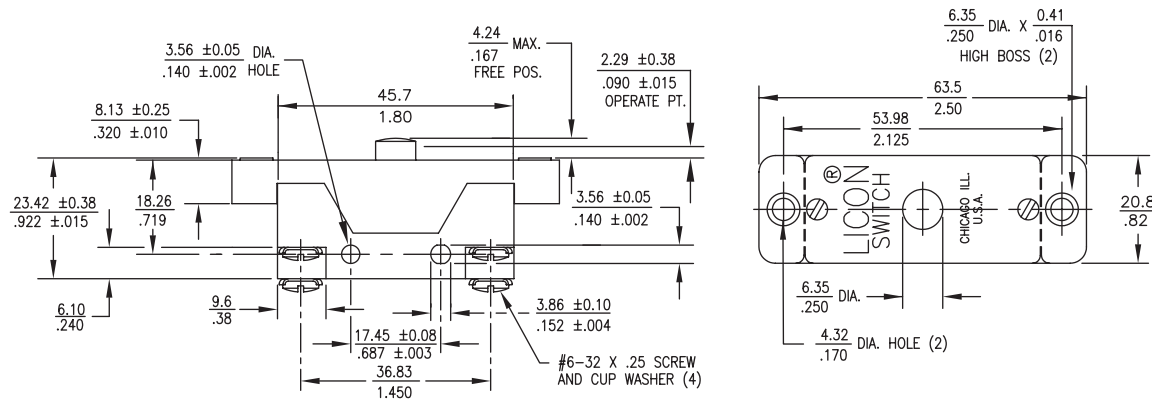
MECHANICAL / ELECTRICAL CHARACTERISTICS:

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

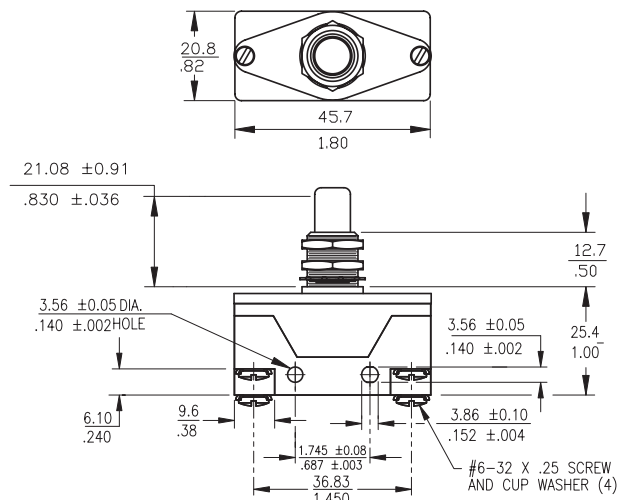
**Terminal:**  
#6 screw with cup washer

**Electrical Ratings :**  
See chart on left

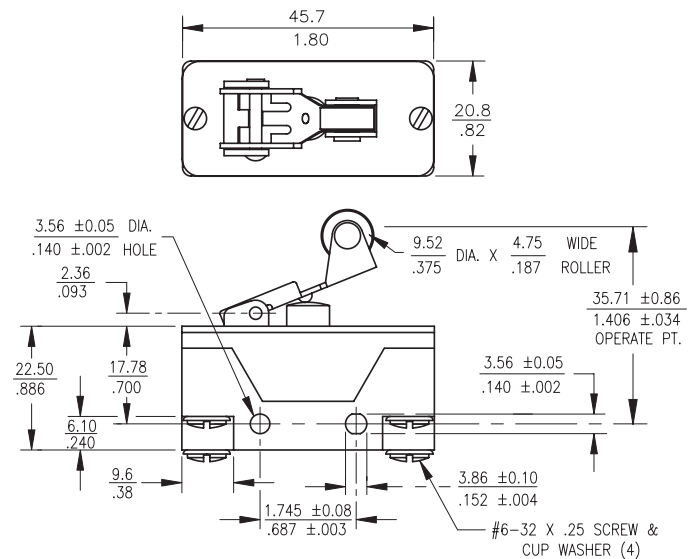
STANDARD BUTTON ACTUATOR—HEAVY DUTY MOUNTING



OVERTRAVEL PANEL MOUNT



ROLLER LEVER



Copyright © 2011 ITW Switches 2011

## 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.

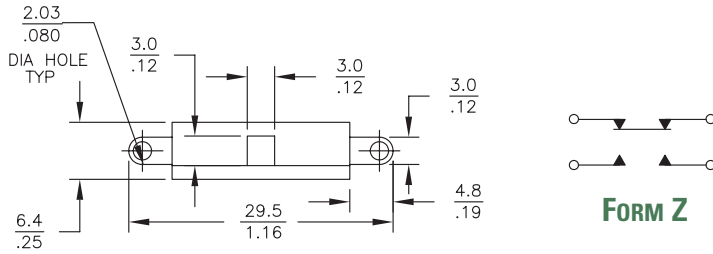
#### Actuators (see page 69 for additional specifications)

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

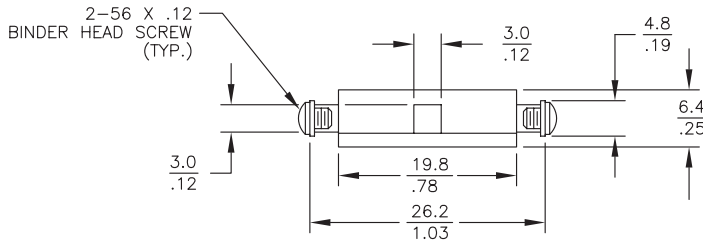
#### STANDARDS / AGENCY / RATINGS:



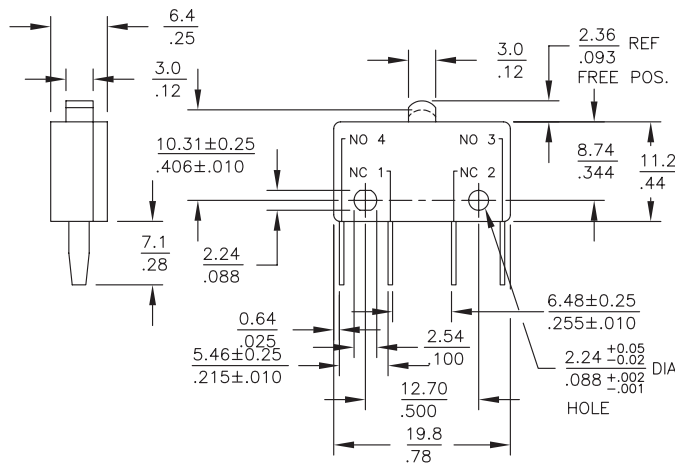
**END SOLDER**



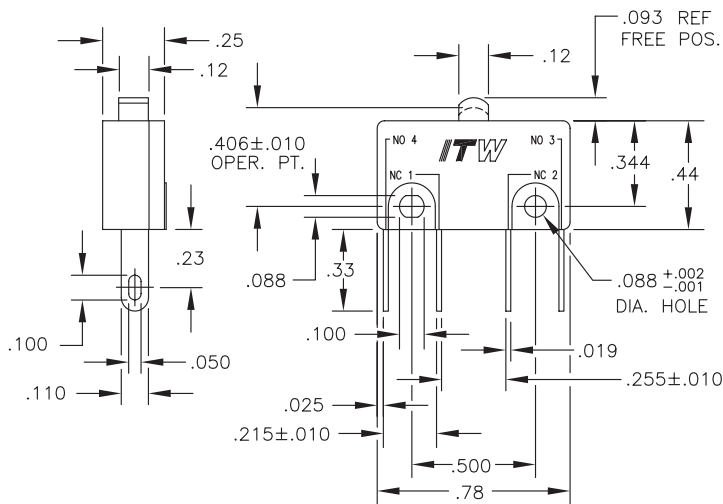
**END SCREW**



**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)

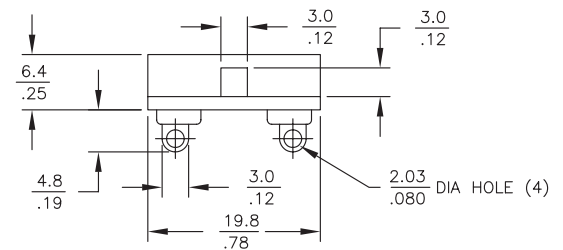
**MIL-PRF-8805/7 QPL listed:**  
16-188051 MS25476-1  
16-488051 MS27217-1

**Electrical Rating @ 28VDC:**

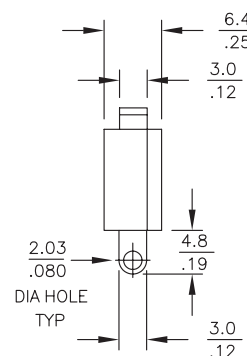
		Sea Level	70,000 Feet
Form Z 2 Circuit	Res	10A	10A
	Ind*	5A	2A
	Lamp	3A	—

\*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



ACTUAL SIZE

#### 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.

#### 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)

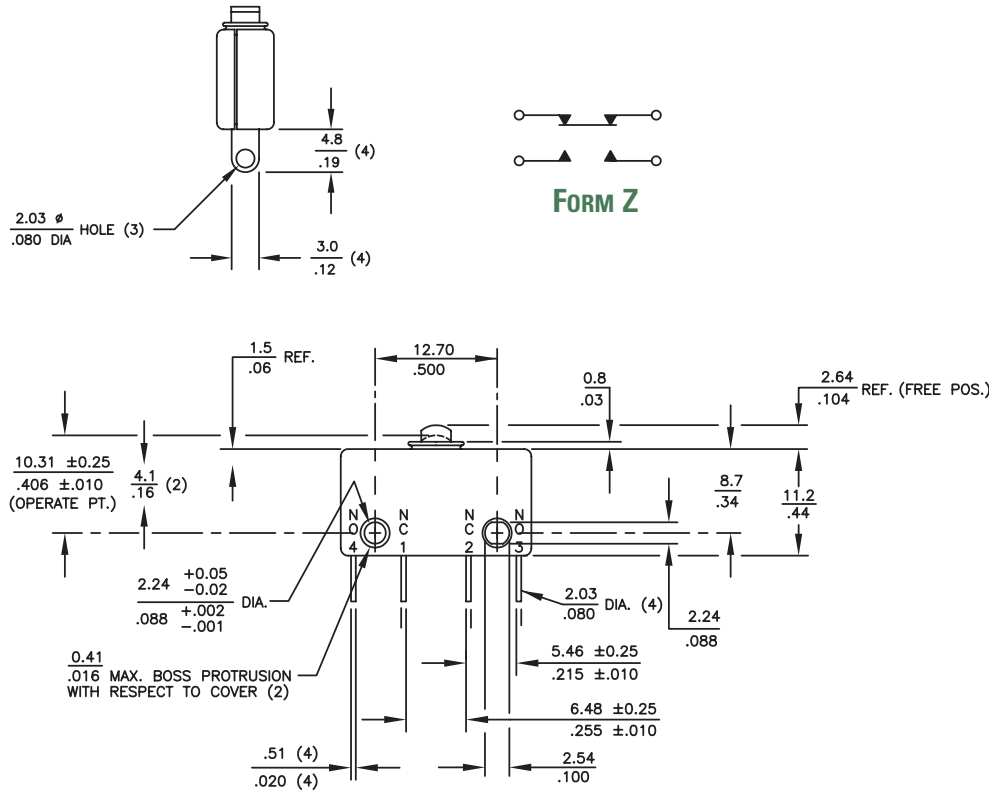
Part Number	Switch Series	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.
<b>76-1200</b> Roller Lever	16	4 oz max	1 oz min	.125 max	.025 min	.045 ± .011
<b>76-1210</b> Lever	16	2.5 oz max	1 oz min	.125 max	.025 min	.047 ± .013
<b>76-1220</b> Short Roller Lever	16	5 + 3 oz - 2 oz min	2 oz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

#### STANDARDS / AGENCY / RATINGS:

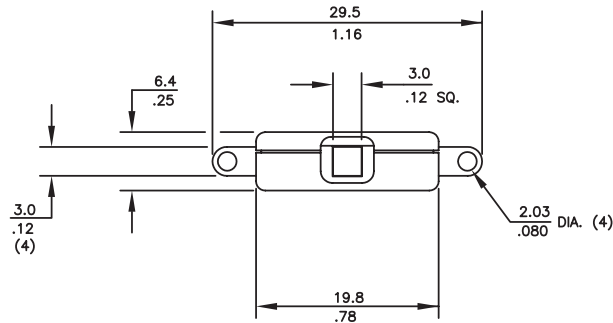




**BOTTOM SOLDER**



**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:**

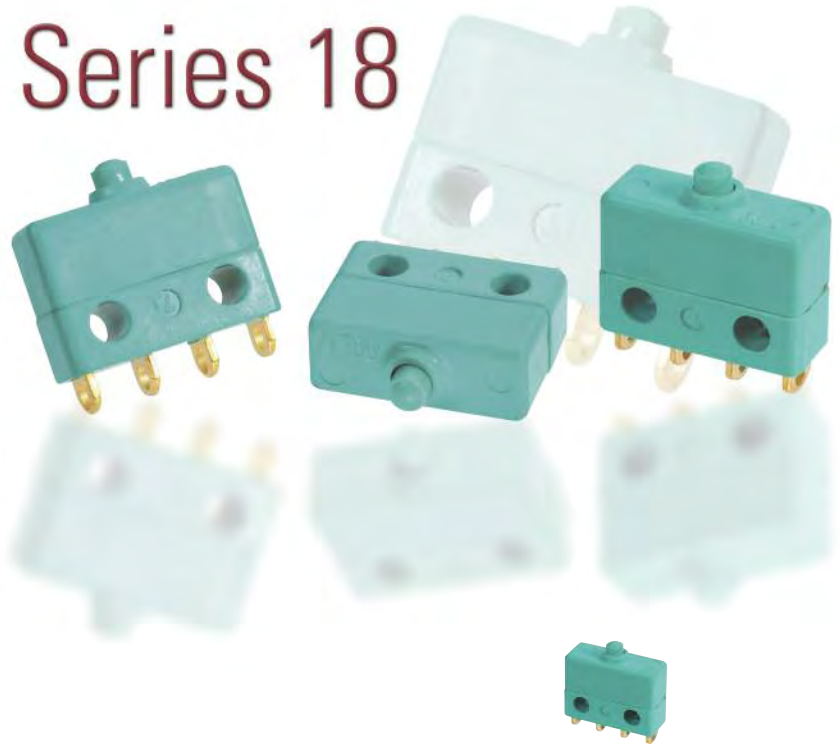
		Sea Level	70,000 Feet
Form Z 2 Circuit	Res	10A	10A
	Ind*	5A	2A
	Lamp	3A	—

\*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> (MS27257-1)	Gold Plated	End Solder	✓

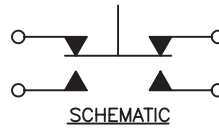
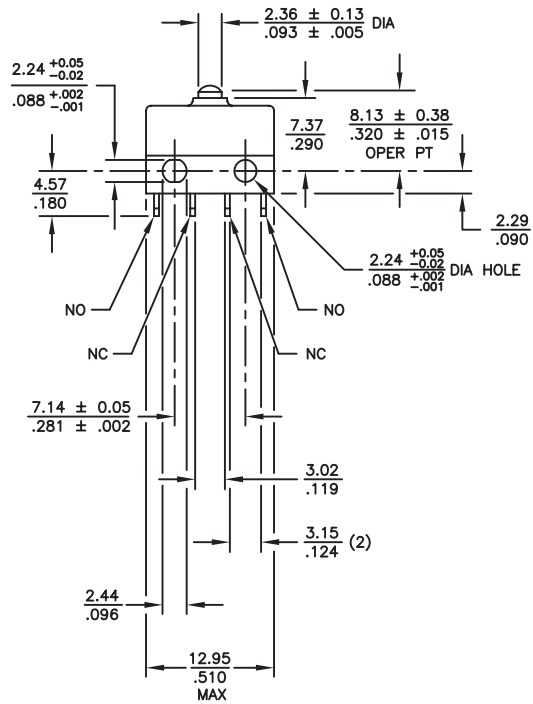
#### Actuator (see page 70 for additional specifications)

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

### STANDARDS / AGENCY / RATINGS:



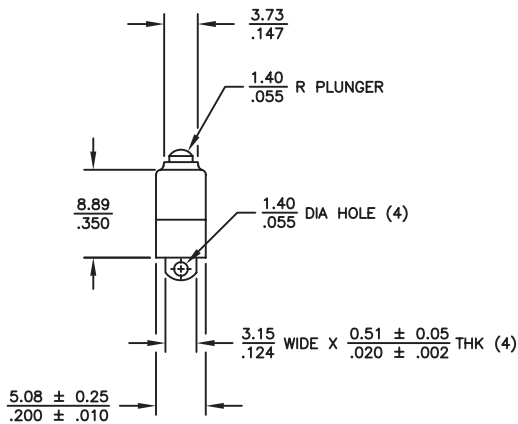
PRODUCT DRAWINGS



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 3 amp Ind*
1 Circuit (SPST)	8 amp Res 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:

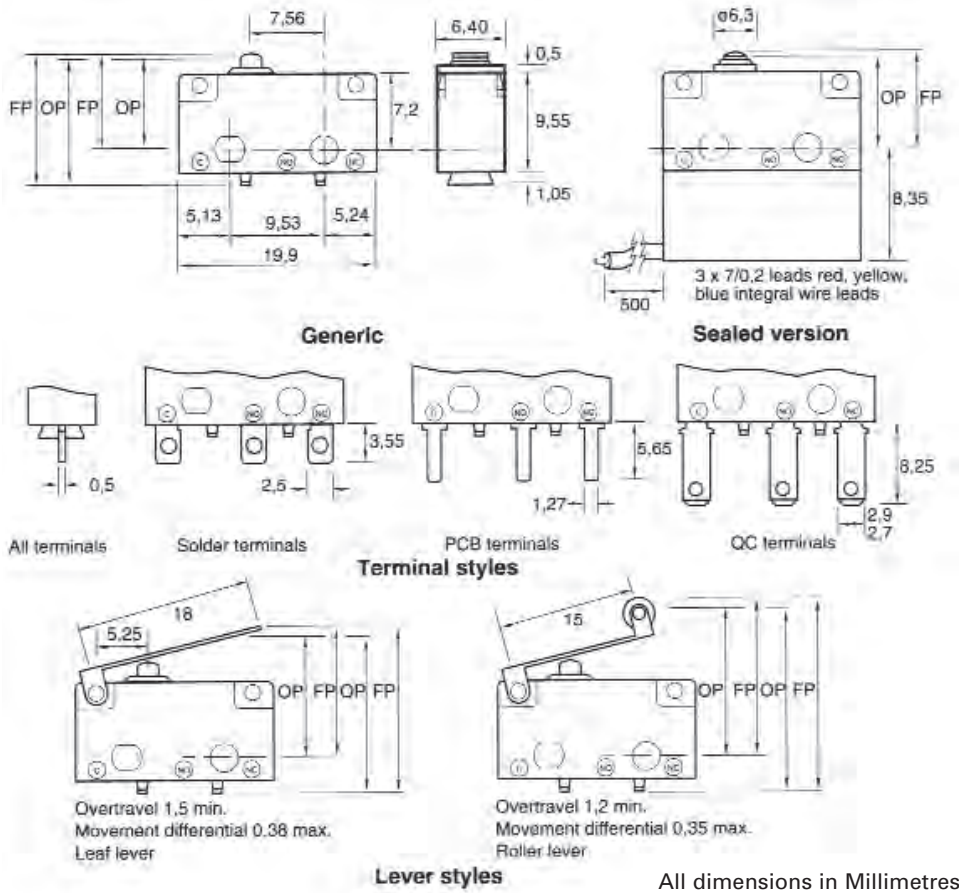
Part Number	Contacts	Actuator Style*	Terminal Style	Sealed	RoHS Compliant	IP67 Compliant
19N402	Silver	Plunger	Solder	Yes	✓	✓
19N402L18	Silver	Leaf lever	Solder	Yes	✓	✓
19N402R15	Silver	Roller lever	Solder	Yes	✓	✓
19N403	Silver	Plunger	Solder	No	✓	—
19N412	Gold	Plunger	Solder	Yes	✓	✓
19N502	Silver	Plunger	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)

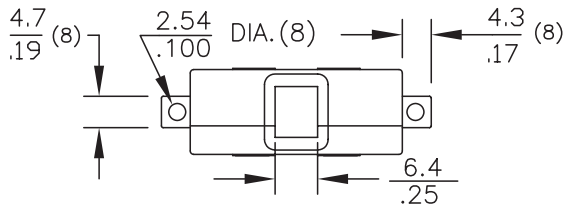
Part Number	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.	Operating Point
<b>72-1160</b> Roller Lever (1)	10 oz max	1.5 oz min	.150 max	.035 min	.070 ± .015	1.0 ± .031
<b>72-2080</b> Over Travel (2)	17 ± 5 oz	4 oz min	.060 max	.215 min	.030 ± .007	.828±.031

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

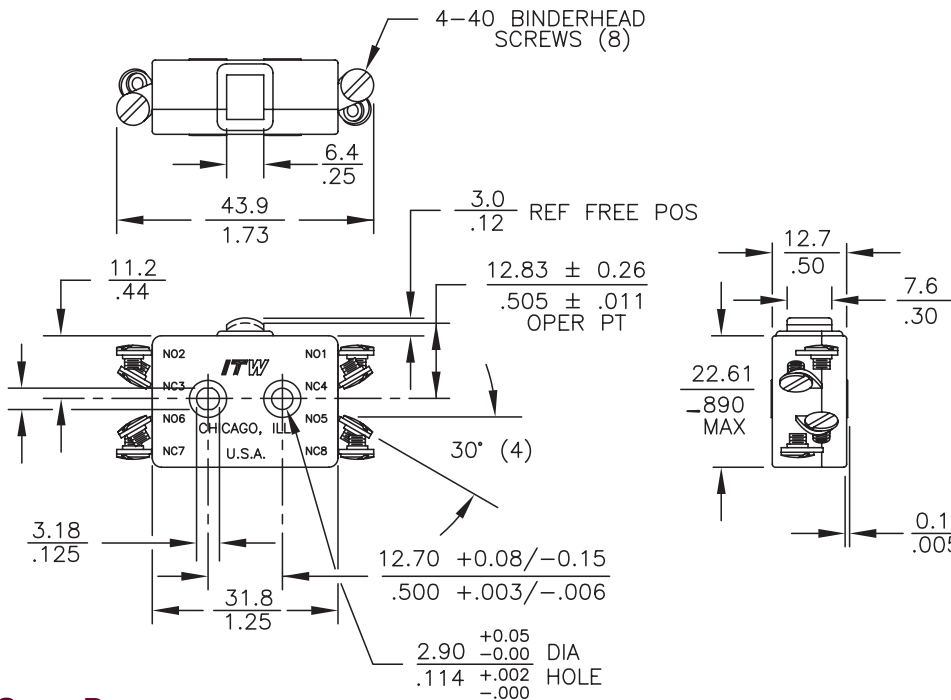
### STANDARDS / AGENCY / RATINGS:



## 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

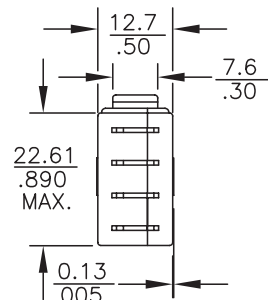
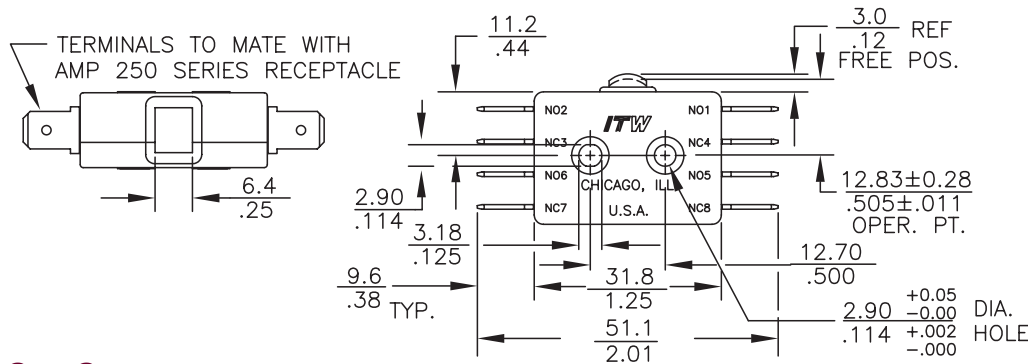
**Operating Point:**  
0.505 inches ± .011  
(from mounting hole centers)

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

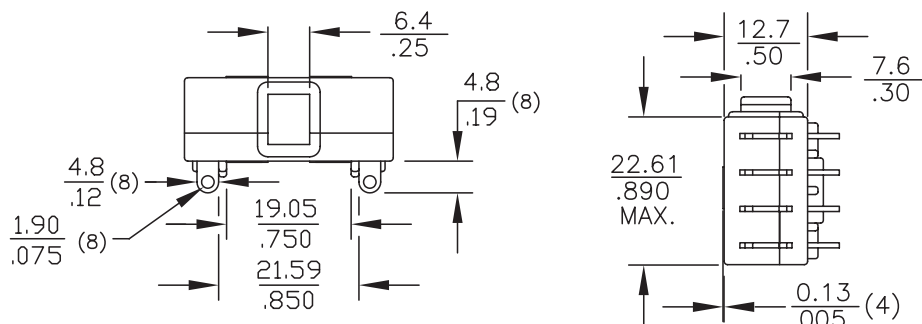
**Electrical Ratings:**

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

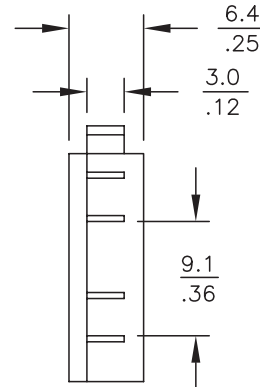
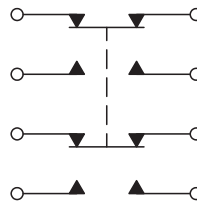
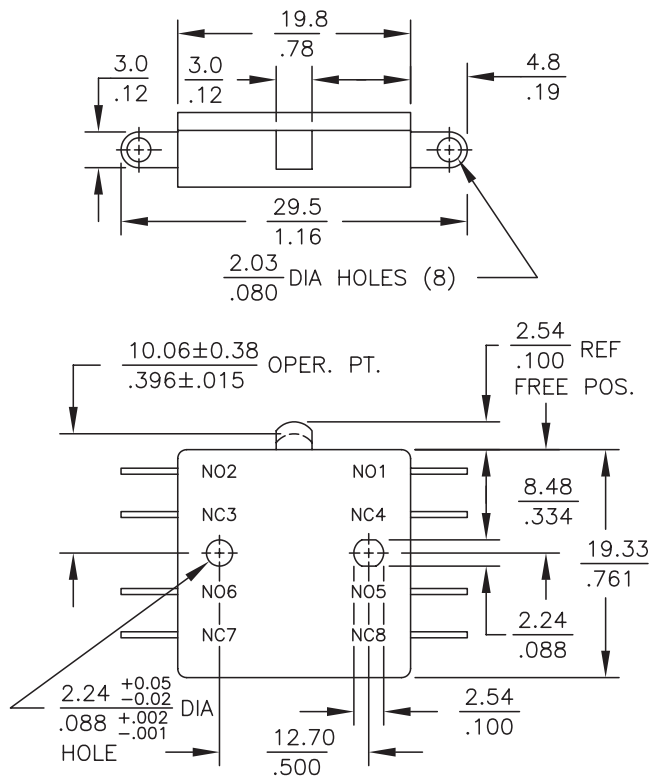
#### Actuator (see page 72 for additional specifications)

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

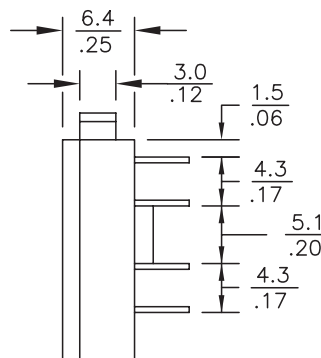
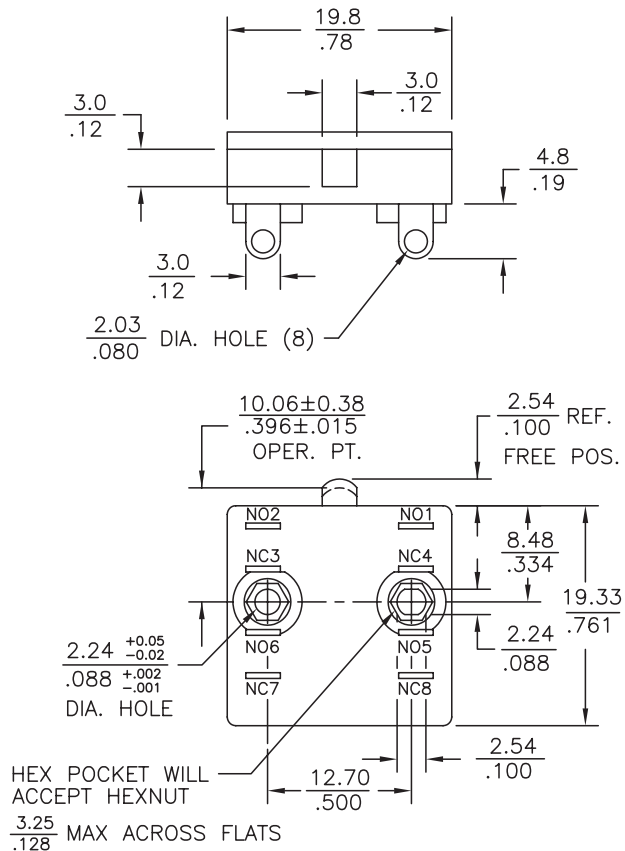
### STANDARDS / AGENCY / RATINGS:



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 (Form ZZ)	8 Amps 5 Amps	125/250 VAC 75-80% PF 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.



ACTUAL SIZE

### 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

### 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)

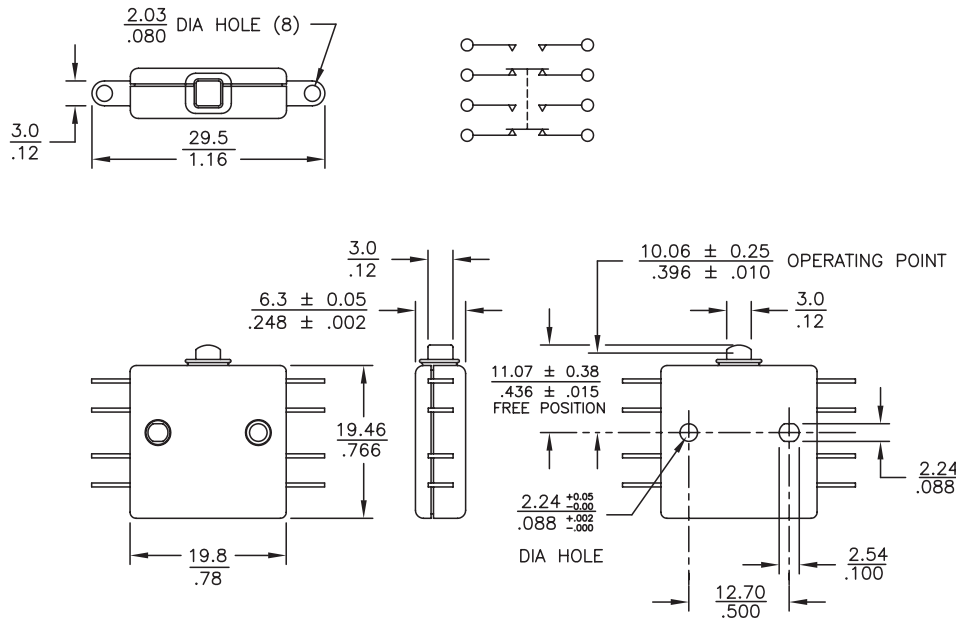
Part Number	Switch Series	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.
<b>76-1200</b> Roller Lever	26	8 oz max	1 1/2 oz min	.130 max	.026 min	.054 ± .022
<b>76-1210</b> Lever	26	7 oz max	2 oz min	.155 max	.025 min	.065 max
<b>76-1220</b> Short Roller Lever	26	16 oz max	5 oz min	.050 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 DPDT	28 VDC 4 CKT	115 VAC 60 HZ DPDT	115 VAC 60 HZ 4 CKT	28 VDC DPDT	28 VDC 4 CKT
Resistive	8 amp	8 amp	6 amp	4 amp	8 amp	8 amp
Inductive	6 amp	4 amp	4 amp	4 amp	2 amp	1 amp
Lamp	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

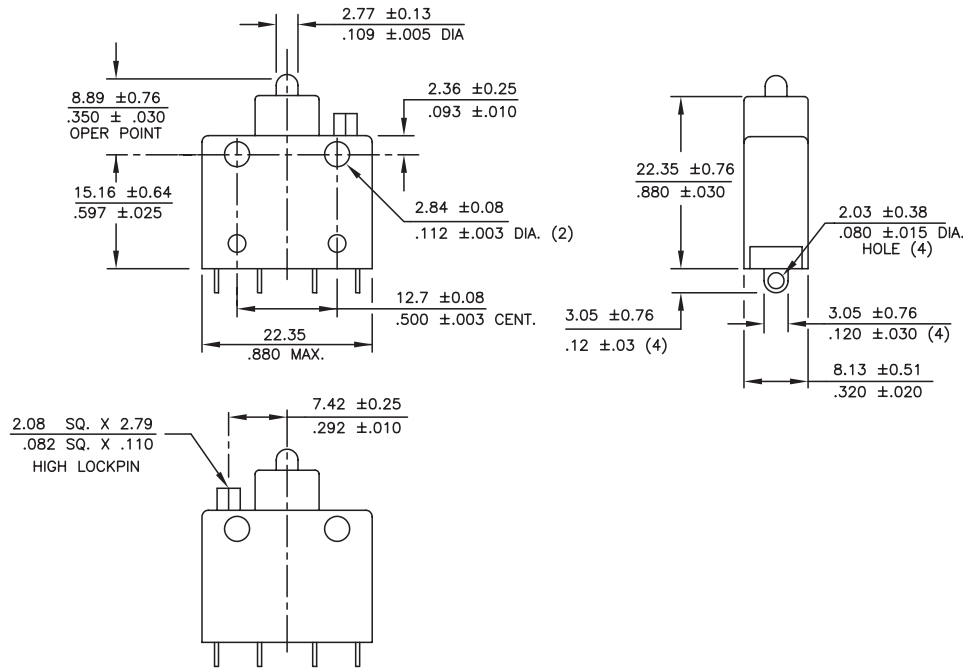
### ORDERING INFORMATION:

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:

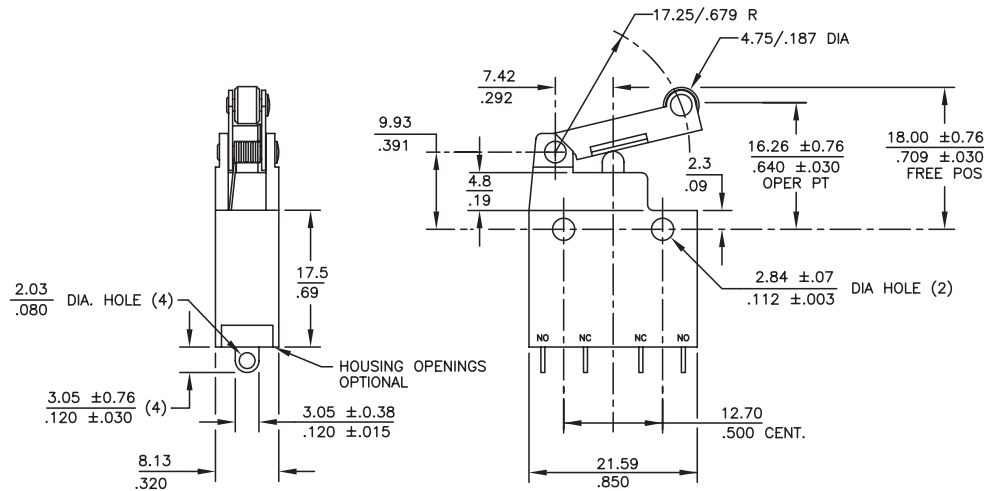
**Circuit:**  
SPDT-DB (Form Z)

**Temperature range:**  
-55°C to +85°C  
(-65°F to +185°F)

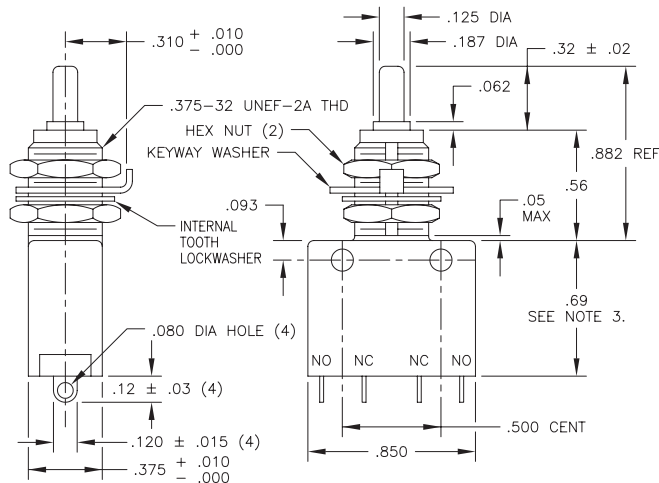
### Electrical Ratings (Typical):

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

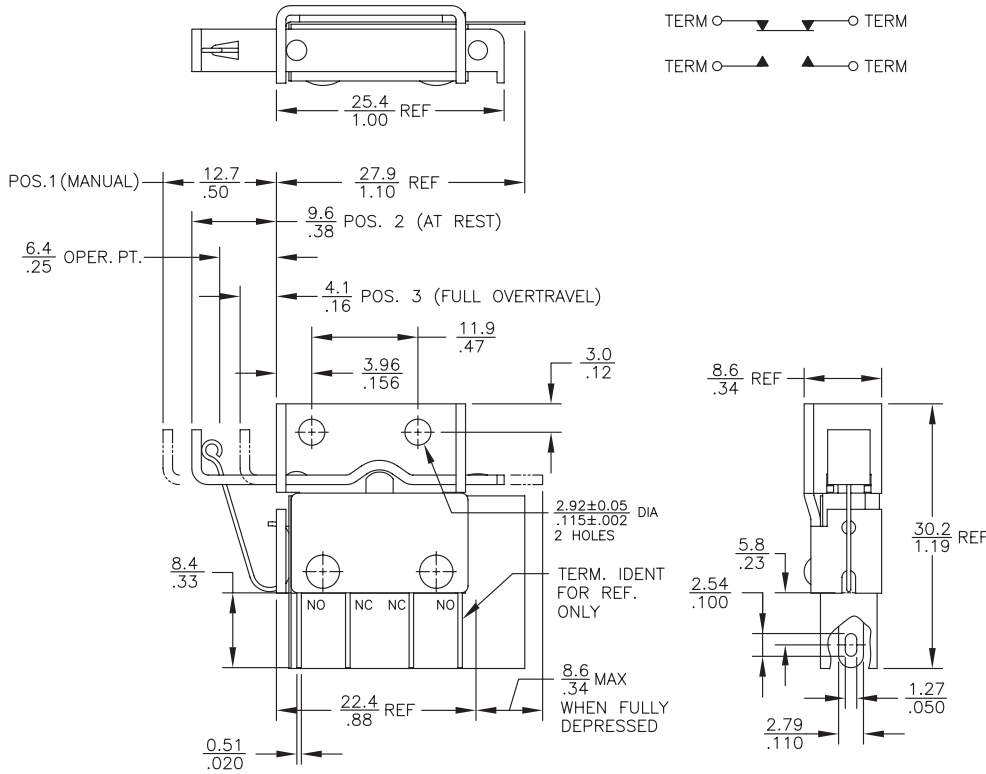
### ORDERING INFORMATION:

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:

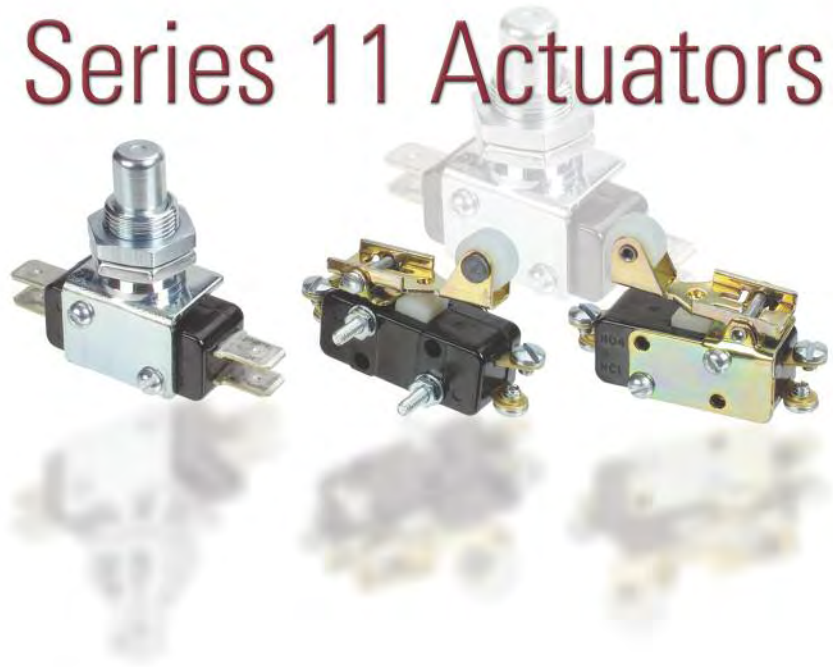
Circuitry	Current	Voltage
Form X or Y	10 Amps	125/250 VAC *
	10 Amps	28 VDC IND
Form Z	5 Amps	125/250 VAC
	3 Amps	28 VDC IND

\* UL and CSA Listed 75% PF



SEE PAGE 46  
FOR SWITCHES

# Series 11 Actuators



## KEY FEATURES:

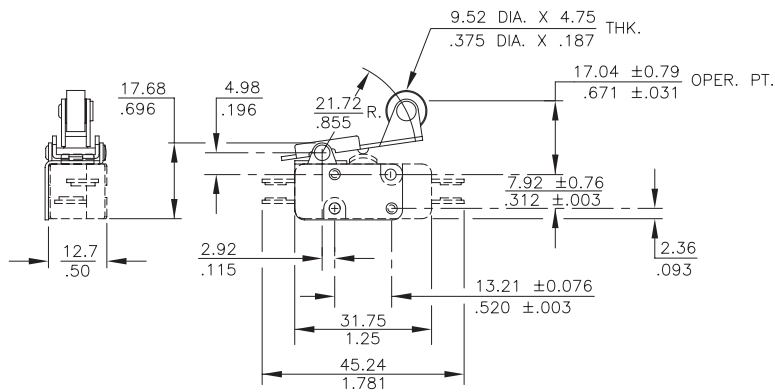
- Roller Lever
- Overtravel

## MECHANICAL CHARACTERISTICS\*:

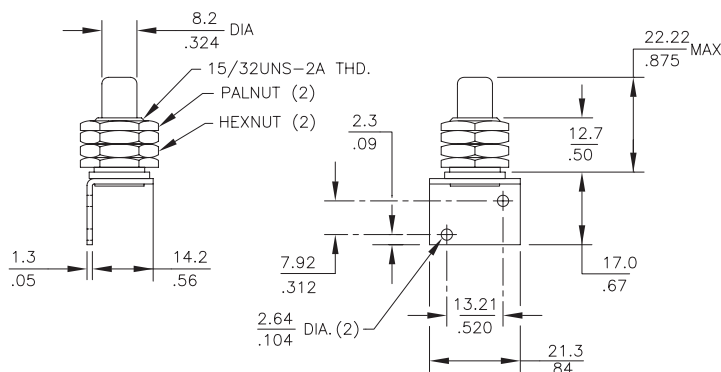
Part Number	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.	Operating Point
<b>71-1040</b> Roller Lever	3.5 oz max	2 oz min	.093 max	.062 min	.030 ± .015	.671 ± .031
<b>71-2010</b> Overtravel Plunger	8 ± .3 oz	4 oz min	.050 max	.215 min	.020 ± .005	.828 ± .015

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

## 71-1040



## 71-2010



# Series 16 Actuators

SEE PAGES 50 & 52  
FOR SWITCHES



**KEY FEATURES:**

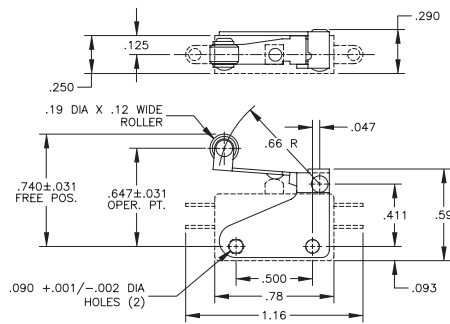
- Roller Lever
- Short Roller Lever
- Lever
- Bushing Mount

**MECHANICAL CHARACTERISTICS:**

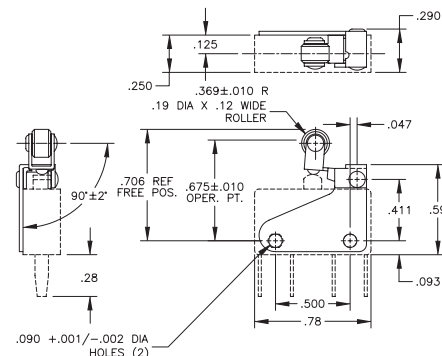
Part Number	Switch Series	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.
<b>76-1200</b> Roller Lever	16	4 oz max	1 oz min	.125 max	.025 min	.045 ± .011
<b>76-1210</b> Lever	16	2.5 oz max	1 oz min	.125 max	.025 min	.047 ± .013
<b>76-1220</b> Short Roller Lever	16	5 + 3 oz - 2 oz min	2 oz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

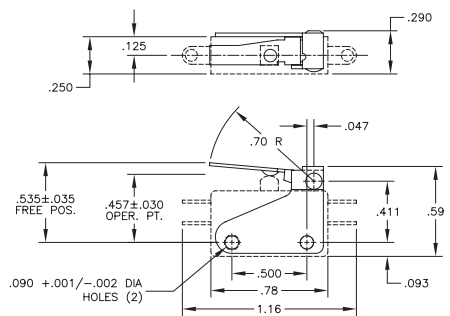
**76-1200**



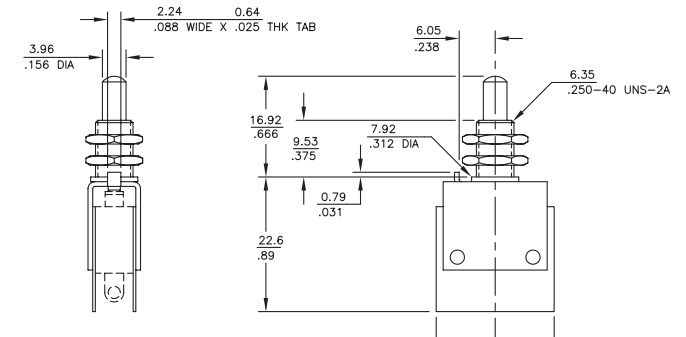
**76-1220**



**76-1210**



**76-22604**



Copyright © 2011 ITW Switches 2011

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

SEE PAGE 54  
FOR SWITCHES

# Series 18 Actuators



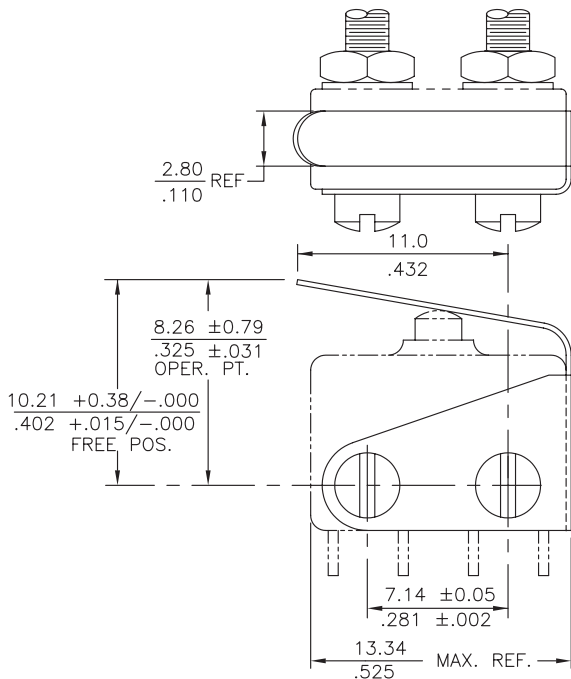
## KEY FEATURES:

- Spring Lever
- Roller Lever

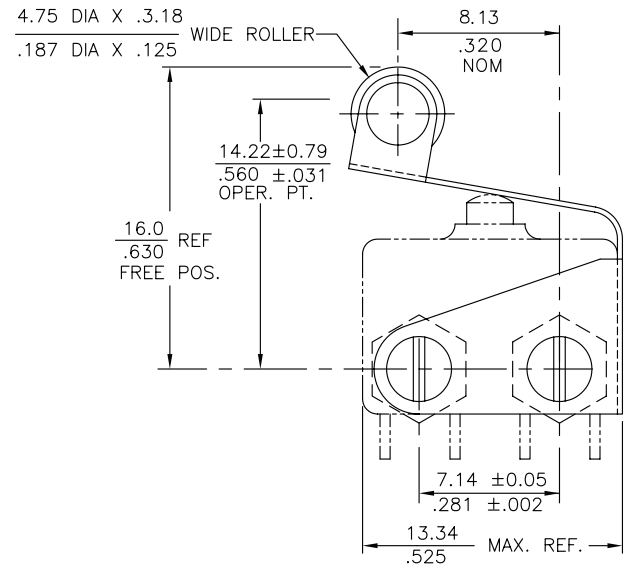
## MECHANICAL CHARACTERISTICS:

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

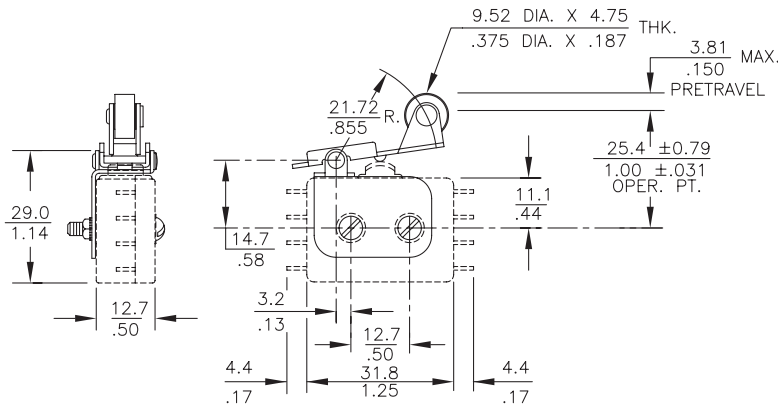
- Roller Lever
- Overtravel

## MECHANICAL CHARACTERISTICS:

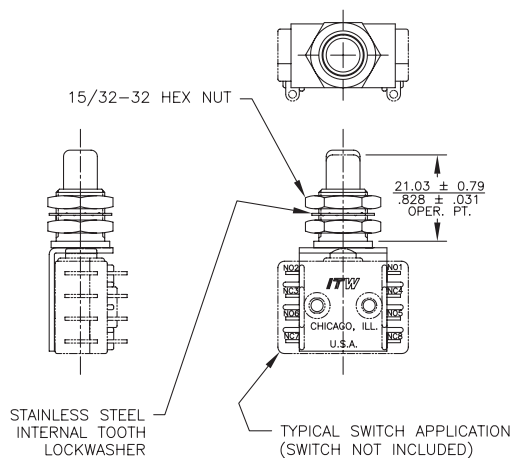
Part Number	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.	Operating Point
<b>72-1160</b> Roller Lever (1)	10 oz max	1.5 oz min	.150 max	.035 min	.070 ± .015	1.0 ± .031
<b>72-2080</b> over travel (2)	17 ± 5 oz	4 oz min	.060 max	.215 min	.030 ± .007	.828 ± .031

(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:

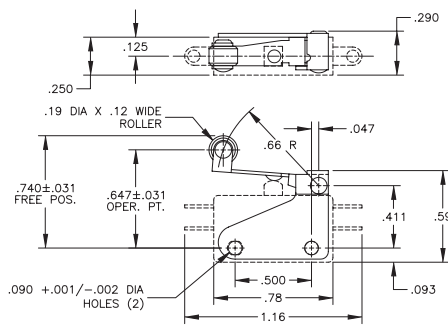
- Roller Lever
- Short Roller Lever
- Lever
- Bushing Mount

## MECHANICAL CHARACTERISTICS:

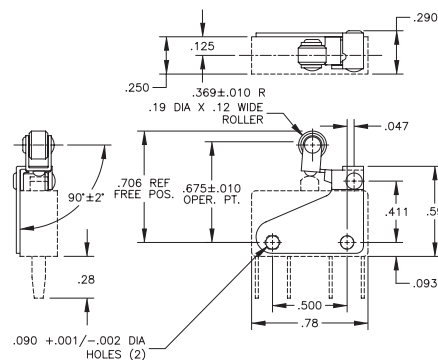
Part Number	Switch Series	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.
<b>76-1200</b> Roller Lever	26	8 oz max	1.5 oz min	.130 max	.026 min	.054 ± .022
<b>76-1210</b> Lever	26	7 oz max	2 oz min	.155 max	.025 min	.065 max
<b>76-1220</b> Short Roller Lever	26	16 oz max	5 oz min	.050 max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

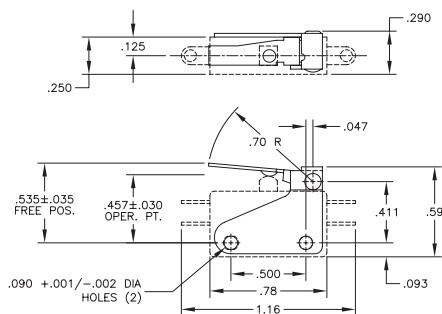
### 76-1200



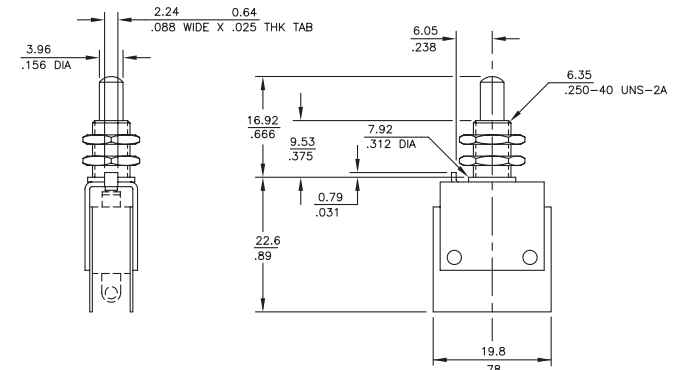
### 76-1220



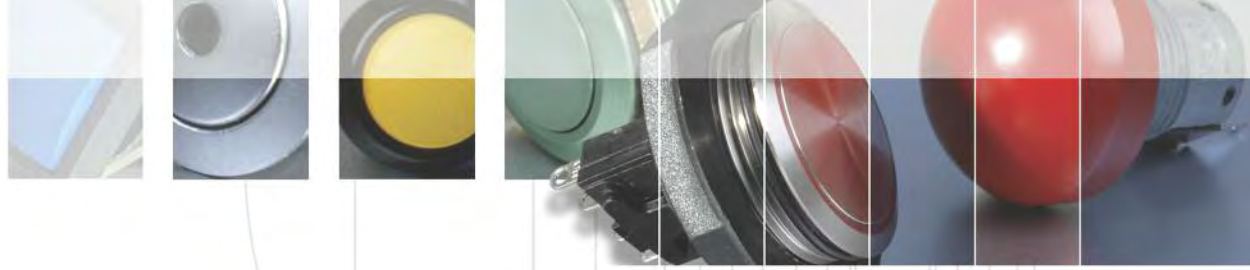
### 76-1210



### 76-22604










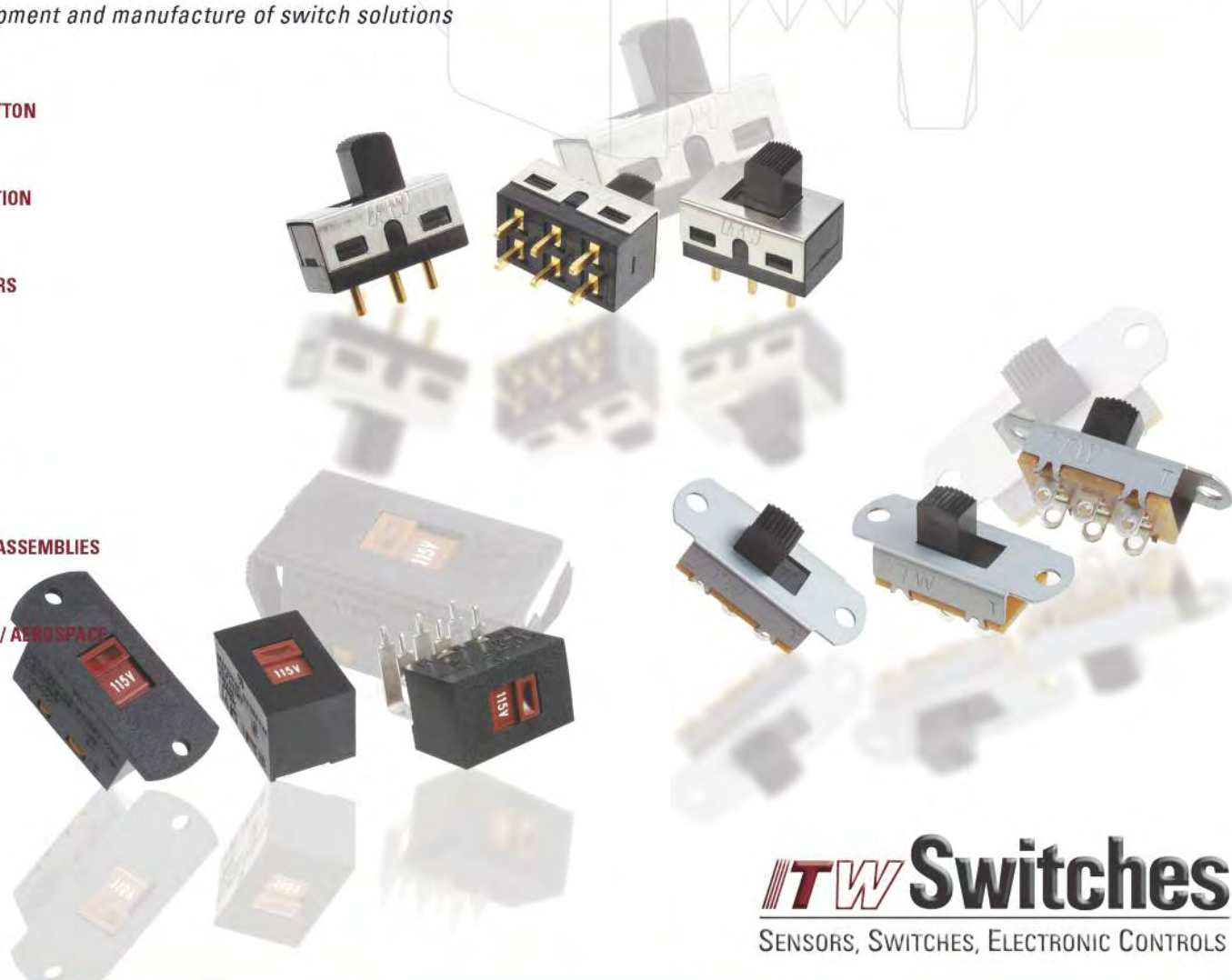




# ITW SWITCHES SLIDE SWITCHES

Design, development and manufacture of switch solutions

-  PUSH BUTTON
-  SNAP ACTION
-  ACTUATORS
-  SLIDE
-  ROTARY
-  CUSTOM ASSEMBLIES
-  MILITARY / AEROSPACE



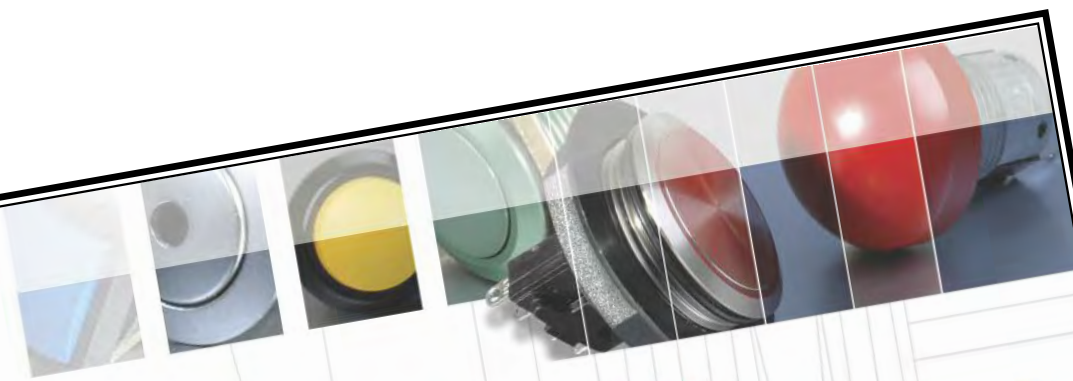
**ITW Switches**  
SENSORS, SWITCHES, ELECTRONIC CONTROLS



[WWW.ITWSWITCHES.COM](http://WWW.ITWSWITCHES.COM)








800.544.3354





# ITW SWITCHES SLIDE 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



[WWW.ITWSWITCHES.COM](http://WWW.ITWSWITCHES.COM)

800.544.335

# SLIDE SWITCHES

---

**Table Of Contents** ..... ii – iii

**Series 23: Mini Mike™ Miniature** ..... 74 – 75

**Series SE1022: Double Pole Line Voltage Selector** ..... 76 – 77



## Series 023

### MINI MIKE MINIATURE SLIDE SWITCHES

This rugged, long life miniature slide switch is ideal for applications where exceptional quality and reliability are needed. Available in SPDT and DPDT configurations, these gold contact slide switches come with PC terminals.



ACTUAL SIZE

### APPLICATIONS

- Medical controls
- Test equipment
- Datacom
- Precision instrumentation

### KEY FEATURES:

- SPDT and DPDT circuits
- Gold Contacts
- PC terminals
- Some versions UL recognized
- Temperature range: -40°C to +100°C

### ORDERING INFORMATION:

Part Number	Circuit	Button Height	Terminal Configuration	Rating
<b>023-021-105</b>	SPDT	0.20	2	250 mA @ 30 VDC
<b>023-021-114</b>	DPDT	0.20	3	100 mA @ 125 VDC
<b>023-021-304 *</b>	SPDT (Form Z)	0.14	4	500 mA @ 30 VDC

\* UL recognized 0.5 A @ 125 VAC, 75 VDC

### STANDARDS / AGENCY / RATINGS:



## MECHANICAL / ELECTRICAL CHARACTERISTICS:

### Circuit:

SPDT (023-021-105) (Form C)  
 DPDT (023-021-114) (Form CC)  
 SPDT-DB (023-021-304) (Form Z)

### Operating force:

200-500 grams (023-021-114)  
 100-500 grams (023-021-105 & 304)

### Electrical rating:

100 milliamps 125 VDC (023-021-114)  
 250 milliamps 30 VDC (023-021-105)  
 0.5 amp 125 VAC (023-021-304)

### Contact resistance:

20 milliohms max initially

### Temperature rating:

-40°F to 212°F  
 (-40°C to 100°C)

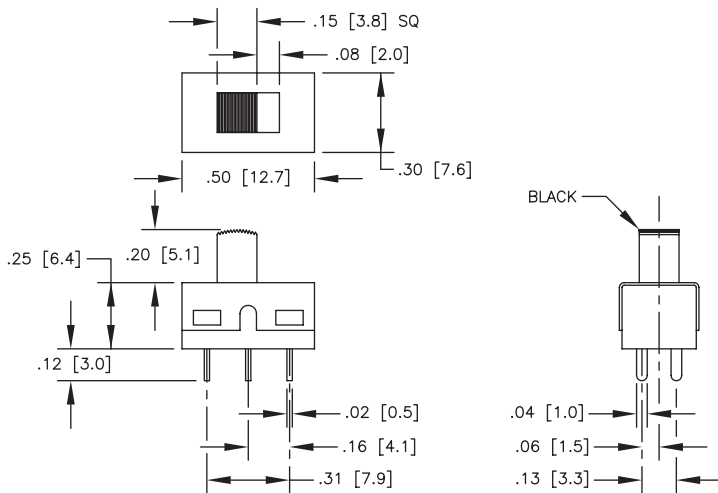
### Life:

100,000 actuations

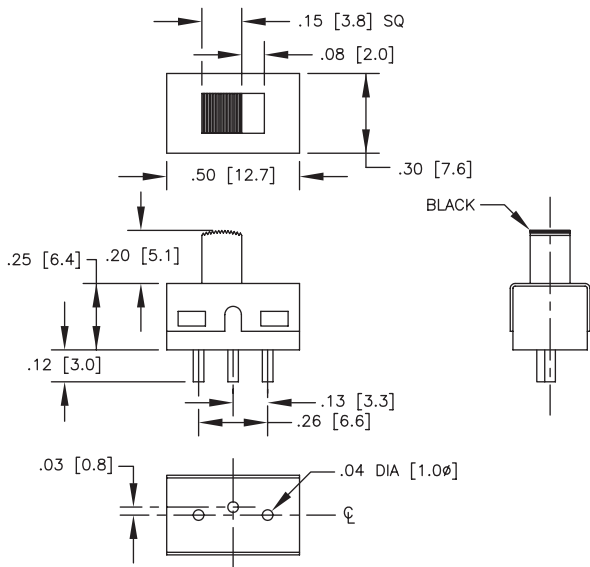
### Contact material:

hard gold over barrier

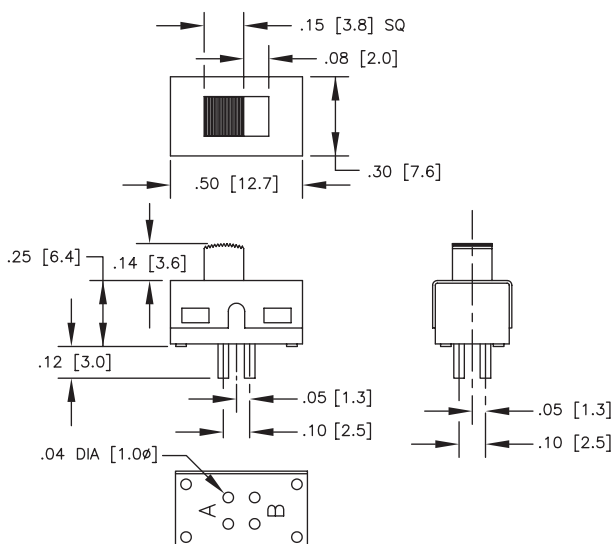
## 023-021-114



## 023-021-105



## 023-021-304





## Series SE1022

### DOUBLE POLE LINE VOLTAGE SELECTOR SWITCHES

This rugged fully enclosed housing is built for tough applications. The positive detect action, status indication and variety of contact configurations make this series ideal for a variety of needs.



ACTUAL SIZE

### APPLICATIONS

- Consumer power supplies
- Lower cost dual use power supplies

### KEY FEATURES:

- Status indication: variety of markings available
- Variety of terminal styles
- Electrical life: 10,000 cycles
- UL recognized and CSA certified and VDE approved
- Variety of mounting styles
- Silver plated contacts

### ORDERING INFORMATION:

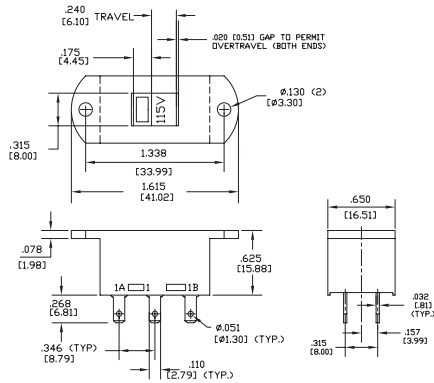
Part Number	Terminals	Dimensions	Marking
<b>18-000-0016</b>	.110 quick connect	1.615 L x .650 W x .625 H	230V/115V
<b>18-000-0019</b>	Right angle	1.030 L x .650 W x .625 H	230V/115V
<b>18-000-0022</b>	PC	1.030 L x .650 W x .625 H	230V/115V
<b>18-000-0040</b>	.110 quick connect	Snap in: .677 x 1.240 Cut out *	230V/115V

\* It is recommended that panel thickness range from .015 to .125" (.038 to 3.18 mm) with switch cut-out punched from front of panel.

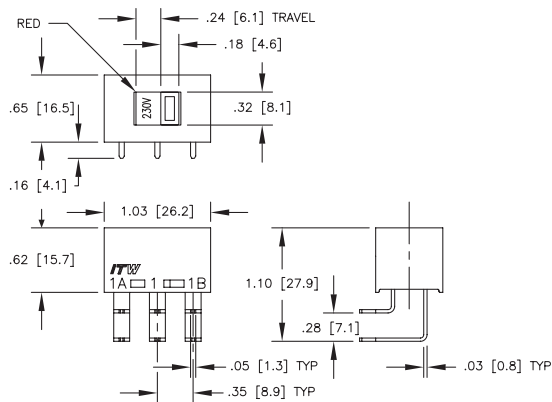
### STANDARDS / AGENCY / RATINGS:



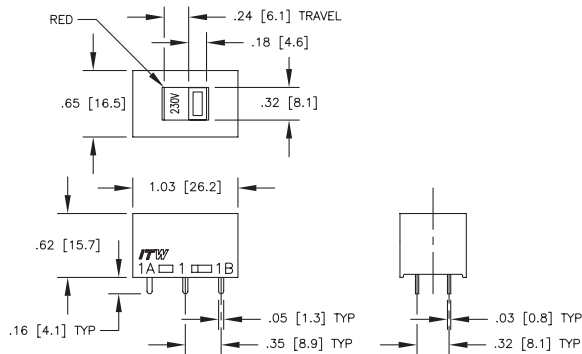
## 18-000-0016



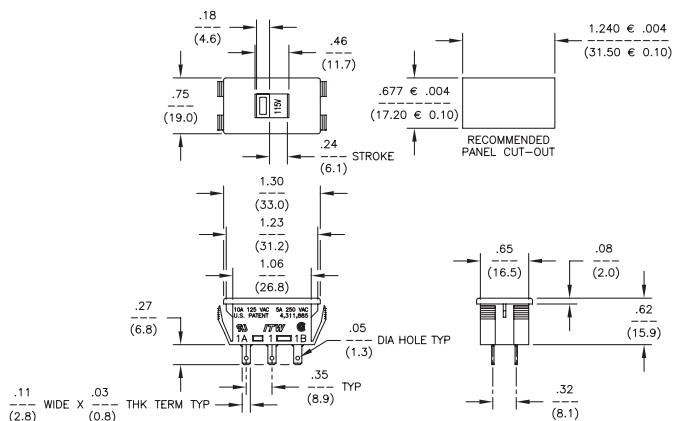
## 18-000-0019



## 18-000-0022



## 18-000-0040



## MECHANICAL / ELECTRICAL CHARACTERISTICS:

### Circuit:

DPDT (Form CC)

### Electrical life:

10,000 cycles

### Housing/actuator:

Nylon 94 V0

### Terminal base:

phenolic laminate

### Terminals:

silver plated copper

### Electrical ratings:

Circuitry	Current	Voltage
DPDT*	10 Amp	125 VAC
DPDT*	5 Amp	250 VAC
DPDT**	10 Amp	125 VAC-T85
DPDT**	5 Amp	250 VAC-T85

\* UL and CSA recognized  
\*\* VDC recognized

# ITW Switches

2550 Millbrook Drive, Buffalo Grove, IL 60089  
800.544.3354 • 847.876.9400 • 847.876.9440 (Fax)  
[www.itwswitches.com](http://www.itwswitches.com)



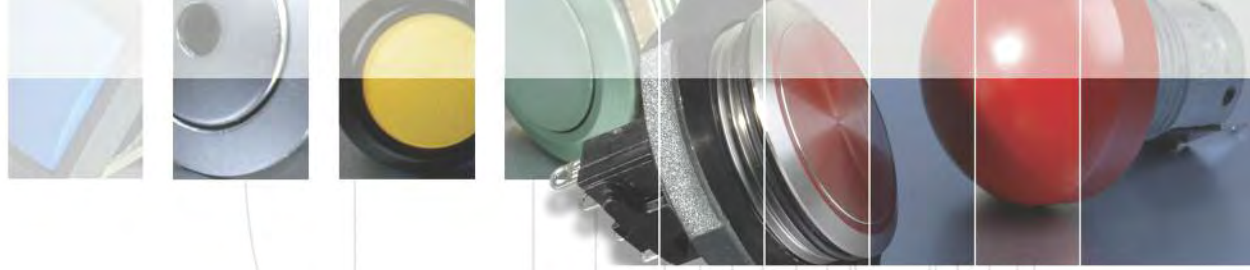
## INTERNATIONAL LOCATIONS

### ITW Electronic Business Asia Co., Limited

Box 26140  
A4-32 Kaohsiung Export Processing Zone  
Kaohsiung, Taiwan  
Republic of China  
886 (7) 811-9206 (Phone)  
886 (7) 811-1795 (Fax)  
[www.itwasia.com.tw](http://www.itwasia.com.tw)








### ITW Switches and Switch Panels

Norway Road  
Hilsea, Portsmouth, England PO3 5HT  
44 (0) 23 92 694971 (Phone)  
44 (0) 23 92 666352 (Fax)  
[www.itwswitches.co.uk](http://www.itwswitches.co.uk)



# ITW SWITCHES ROTARY SWITCHES

Design, development and manufacture of switch solutions

-  PUSH BUTTON
-  SNAP ACTION
-  ACTUATORS
-  SLIDE
-  ROTARY
-  CUSTOM ASSEMBLIES
-  MILITARY / AEROSPACE



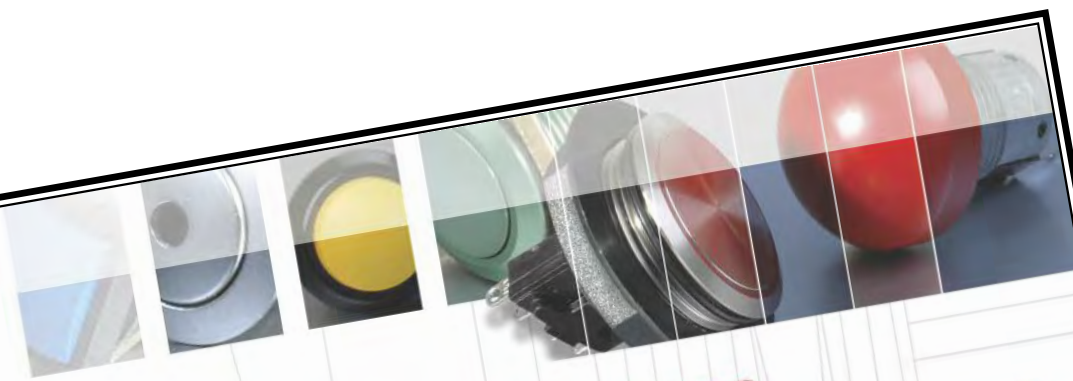
**ITW Switches**  
SENSORS, SWITCHES, ELECTRONIC CONTROLS



[WWW.ITWSWITCHES.COM](http://WWW.ITWSWITCHES.COM)








800.544.3354





# ITW SWITCHES ROTARY 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



[WWW.ITWSWITCHES.COM](http://WWW.ITWSWITCHES.COM)

800.544.335



# ROTARY SWITCHES

---

**Table Of Contents** ..... ii – iii

**Series 030: Sub-Miniature T-05 Space Saver** ..... 78 – 79



# ROTARY SWITCHES

## SUB-MINIATURE T-05 SPACE SAVER ROTARY SWITCHES

This sub-miniature rotary switch has up to 8 positions in a T-05 can. Gold contacts deliver long life and reliability. Contacts are glass to metal sealed to prevent solder flux penetration. The Series 030 can be used for manually programming a single PC board for test or multi-function use.

# Series 030



ACTUAL SIZE

### APPLICATIONS

- Communications equipment
- Cable TV equipment
- Circuit breakers
- Timers
- Thermostatic controls

### KEY FEATURES:

- Gold contacts
- Up to 8 positions
- Life: 10,000 mechanical actuation (nom.)
- Variety of actuator lengths
- Glass to metal sealed header
- PC terminals
- Sub-miniature package size (.36" diameter)

### ORDERING INFORMATION:

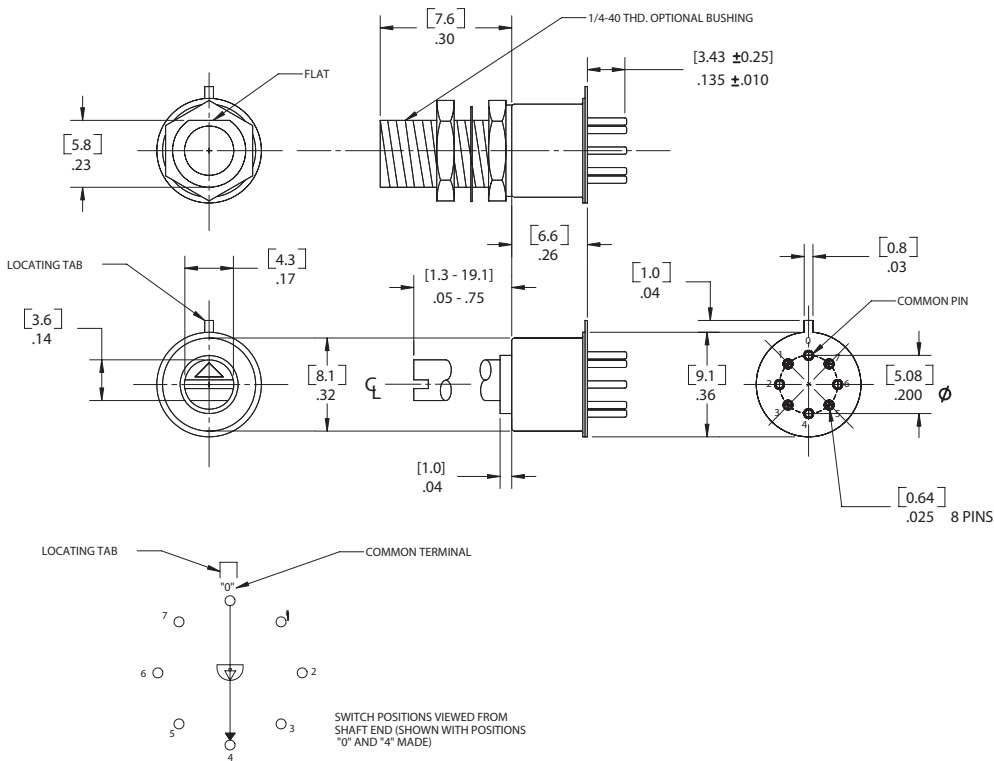
Part Number	Positions	Shaft Length	Custom *
030-202-018	2	0.18	—
030-303-018	3	0.18	—
030-404-018	4	0.18	—
030-404-904	4	0.05	Black Insert, Spacer, No Post
030-404-905	4	0.05	Red Insert, Micro Plastic Spacer
030-505-018	5	0.18	—
030-505-906	5	0.05	Black Insert, Spacer, No Post
030-606-018	6	0.18	—
030-606-902	6	0.30	Black Insert, Spacer, No Post
030-808-005	8	0.05	—
030-808-030	8	0.30	—
030-808-907	8	0.05	Black Insert, Spacer, No Post
030-808-908	8	0.30	Black Insert, Spacer, No Post
030-808-909	8	0.30	No Insert, Spacer, No Post

\* Subject to change without notice, all orders are NC & NR.

### STANDARDS / AGENCY / RATINGS:



## 030-XOX-XXX



### MECHANICAL / ELECTRICAL CHARACTERISTICS:

**Contact rating:**  
dry circuit to 500 mA  
@ 125 VAC

**Contact material:**  
hard gold over barrier

**Contact resistance:**  
80 milliohms Max (initially)

**Life:**  
10,000 actuations

**End of life criteria:**  
100 milliohms  
contact resistance

**Angle of throw:**  
45° / position—  
8 positions max

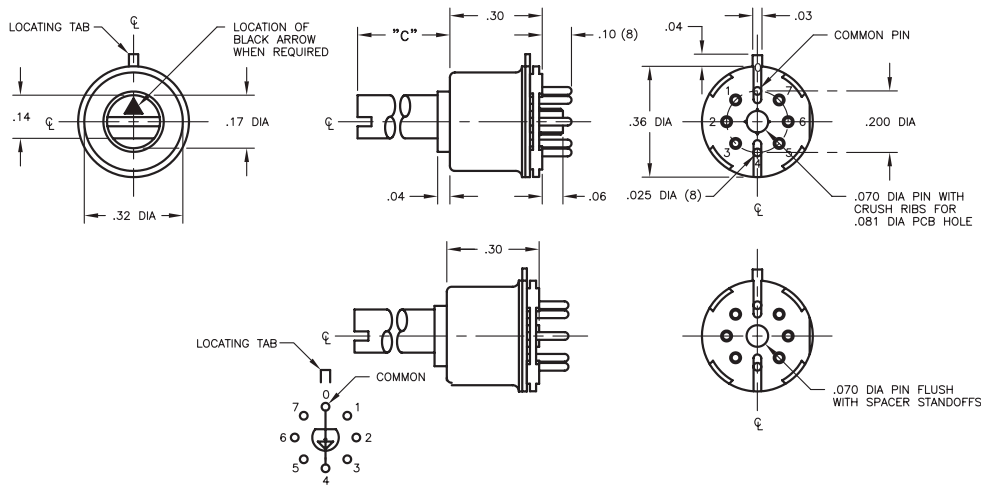
**Breakdown voltage:**  
500 V 60 HZ

**Insulation resistance:**  
50,000 megohms

**Actuation torque:**  
85 inch—grams nom initially

**Temperature range:**  
-30°C to +100°C

## 030-XOX-9XX



# Custom Solution



## The ITW Six Step Plan from concept to implementation

1

STEP ONE  
We listen



We attend a planning meeting with your team where we form an understanding of your needs and expectations through our team of sales and engineering experts.

2

STEP TWO  
Utilize proven technology



We offer the benefits of our engineers strengths including diverse experience from serving many industries, a well rounded knowledge of electronic and electromechanical processes, and the ability to sort and evaluate a variety of opinions and information.

3

STEP THREE  
Define the concept



A team of professional ITW Design Engineers will conceptualize your requirements, generating a variety of potential directions to consider. A team evaluation will then define the best concept and develop it further.

800.544.3354  
www.itwswitches.com



For over 54 years we've gained a reputation for the highest quality standards, innovative ideas and a rapid response to customer requirements.

**Partnership**

ITW Switches has the willingness, the engineering resources, and the global manufacturing capability to design, develop, manufacture and supply exactly the product you need for your specific application. We can help you to identify opportunities by finding better and more economic ways to build your products,

lower total costs, enhance performance, increase desirability, speed assembly and win a greater share of the market. How can we do this? By following our tried and tested Six Step Plan to design and development success, controlled and monitored all the way by dedicated and experienced design professionals.



**4**

**STEP FOUR**  
Final concept presented



We present you with the final concept, addressing all criteria such as anticipated schedules, final cost analysis and savings, and specific design benefits.

**5**

**STEP FIVE**  
Development of prototypes



We jointly agree on a design direction and the development of prototypes begins. Our in house rapid prototyping, desktop molding, and highly skilled tool and model technicians add unbeatable value at this stage.

**6**

**STEP SIX**  
Finished component supplied



Upon full, joint approval of the prototype, tooling and preproduction planning are finalized. ITW Manufacturing facilities then provide dependable assembly, individual testing, and packaging to your finished components, all controlled under our ISO9001:2000/AS9100 Quality Standards.



## WHY CHOOSE ITW SWITCHES FOR YOUR MIL / AERO APPLICATION...

**1) Engineering Excellence** — ITW Switches started as the Licon division, our specialty is in high-load snap action switches using the Butterfly double-break design for reliable and long lifecycle results. New Product Development includes custom electromechanical assemblies, solid-state sensors for NextGen requirements, or any design / quality / application challenge that you may have. Designs can be modeled using 3D CAD, built using in-house fabrication and rapid prototyping, and testing using our UL-Approved test lab.

*Use us for your design needs!*



**2) Manufacturing Capabilities** — Mil / Aero products are produced in Buffalo Grove, IL – the same facility as the engineers that designed the product. Delivery is supported either direct or through our distribution channel with the capability to support Kanban, Just in Time (JIT), and other delivery options.

**3) Quality Control** — Buffalo Grove facility has MIL-PRF-8805, ISO 9001:2000 and AS900B quality ratings. Our Military QPL products are 100% inspected and we stand behind our product with an industry leading 36 month warranty. Six Sigma certified management maintains high quality with tools such as Failure Modes and Effects Analysis (FMEA), lot control, and traceability.

**4) Custom Design** — Products are designed to the customer specifications based on particular needs. Specifications can include hermetic seal, high/long life cycle, high actuation force, vibration resistance, capability to withstand high G-forces, IP rating seal, chemical resistance, various connector and harness types, and many more. We are recognized in the industry as both a designer and supplier of high-quality and reliable parts.

**5) Service** — Our Sales Staff has personnel dedicated strictly to the Mil / Aero Market for specific focus and knowledge in the market. Customer Service provides key customer contact for accurate planning and order entry, fast turnaround on supplier surveys, Defense Federal Acquisition Regulation Supplement (DFARS), and certifications needed, and is there to help you with any questions or needs that you might have.

### KEY PRODUCTS

- KAP-16
- KAP-26
- Series-18
- Series-26
- Series-63
- Series-65



### APPLICATIONS

- Landing gear
- Missile ejection / activation
- Pilot ejection
- Vehicle brake switches
- Aircraft actuator / contactors
- Aircraft rotary actuator
- Fuel valves

MILITARY SPECIFICATION NUMBER	MILITARY PART NUMBER	ITW PART NUMBER	NATIONAL STOCK NUMBER	CATALOG PAGE NUMBER
MIL-PRF-8805/7	MS25476-1	<b>16-188051</b>	5930-00-843-0145	pp 50 – 51
	MS27217-1	<b>16-488051</b>	5930-00-824-9433	pp 50 – 51
	MS27217-2	<b>16-388051</b>	5930-00-435-6626	pp 50 – 51
MIL-PRF-8805/39	MS21321-1	<b>63-210050</b>		call factory
	MS21321-2	<b>63-210055</b>		call factory
MIL-PRF-8805/40	MS24331-1	<b>63-210021</b>	5930-00-503-3883	call factory
	MS24331-2	<b>63-210029</b>	5930-00-837-6694	call factory
	MS24331-3	<b>63-210028</b>		call factory
	MS24331-4	<b>63-210026</b>		call factory
	MS24331-6	<b>63-210155</b>		call factory
MIL-PRF-8805/76	MS27257-1	<b>18-488051</b>	5930-00-420-8517	pp 54 – 55
MIL-PRF-8805/77	M8805/77-001	<b>26-888051</b>	5930-00-005-7051	pp 60 – 61
	M8805/77-002	<b>26-988051</b>	5930-00-127-4224	pp 60 – 61
	M8805/77-003	<b>26-810</b>		pp 62 – 63
	M8805/77-004	<b>26-910</b>		pp 62 – 63
MIL-PRF-8805/80	M8805/80-01	<b>62-200021</b>	5930-00-401-6456	call factory
MIL-PRF-8805/84	M8805/84-001	<b>65-230101</b>		pp 64 – 65
	M8805/84-002	<b>65-330101</b>	5930-01-325-8299	pp 64 – 65
	M8805/84-003	<b>65-430101</b>	5930-01-123-1471	pp 64 – 65
	M8805-84-004	<b>65-230102</b>		pp 64 – 65
	M8805/84-005	<b>65-330102</b>		pp 64 – 65
	M8805/84-006	<b>65-430102</b>		pp 64 – 65
MIL-PRF-8805/100	M8805/100-001	<b>63-210175</b>		call factory
	M8805/100-002	<b>63-210176</b>	5930-00-332-0780	call factory
	M8805/100-003	<b>63-210177</b>		call factory
	M8805/100-004	<b>63-710085</b>		call factory
	M8805/100-005	<b>63-710086</b>	5930-00-417-3819	call factory
	M8805/100-006	<b>63-710087</b>		call factory
	M8805/100-007	<b>63-210178</b>	5930-00-417-5935	call factory
	M8805/100-008	<b>63-210179</b>		call factory
	M8805/100-009	<b>63-710088</b>	5930-00-417-3684	call factory
	M8805/100-010	<b>63-710089</b>		call factory
	M8805/100-011	<b>63-210014</b>	5930-01-082-9586	call factory
	M8805/100-012	<b>63-210015</b>		call factory
	M8805/100-013	<b>63-710009</b>	5930-01-186-0178	call factory
	M8805/100-014	<b>63-710010</b>	5930-01-199-7192	call factory
	M8805/100-015	<b>63-210016</b>	5930-01-050-9100	call factory
	M8805/100-016	<b>63-210017</b>	5930-01-100-8531	call factory
	M8805/100-017	<b>63-710011</b>	5930-01-114-2944	call factory
	M8805-/100-018	<b>63-710012</b>	5930-01-395-5067	call factory

# CROSS REFERENCE

023-021-105	74	16-40401	50	39-12113	4
023-021-114	74	16-4044	50	39-12114	4
023-021-304	74	16-40441	50	39-12502	4
030-202-018	78	16-410	52	39-12503	4
030-303-018	78	16-488051	50	39-12509	4
030-404-018	78	16-530004	50	39-12601	4
030-404-904	78	18-000-0016	76	39-12712	4
030-404-905	78	18-000-0019	76	39-13101	4
030-505-018	78	18-000-0022	76	39-13113	4
030-505-906	78	18-000-0040	76	39-22100	4
030-606-018	78	18-40421	54	39-22500	4
030-606-902	78	18-488051	54	39-23100	4
030-808-005	78	19N402	56	39-23500	4
030-808-030	78	19N402L18	56	39-422106	6
030-808-907	78	19N402R15	56	39-422508	6
030-808-908	78	19N403	56	39-422607	6
030-808-909	78	19N412	56	39-422609	6
034-550-001	2	19N502	56	39-422707	6
034-550-002	2	19N503	56	39-422710	6
034-550-005	2	19N512	56	39-423508	6
034-550-006	2	19N602	56	39-423609	6
034-550-010	2	19N603	56	39-522101	6
034-550-015	2	19N702	56	39-522701	6
11-104	46	19N703	56	39-523101	6
11-204	46	19N712	56	39-523501	6
11-304	46	19N713	56	39-800001	4
11-314 Reset	46	19N920	56	39-82N	8
11-504	46	19N922	56	39-82S	8
14-124	48	22-104	58	39-83N	8
14-12404	48	22-204	58	39-83S	8
14-324	48	22-304	58	47-1111	10
14-724	48	22-504	58	47-1121	10
16-104	50	26-804	60	47-1131	10
16-110	52	26-810	62	47-1141	10
16-111	52	26-888051	60	47-1151	10
16-188051	50	26-904	60	47-1161	10
16-204	50	26-988051	60	47-1171	10
16-304	50	39-12101	4	47-2111	10
16-404	50	39-12111	4	47-2121	10

800.544.3354

[www.itwswitches.com](http://www.itwswitches.com)

  
SENSORS, SWITCHES, ELECTRONIC CONTROLS

47-2131.....	10	49-413G .....	20	59-111.....	36
47-2141.....	10	49-413R .....	20	59-112.....	36
47-2151.....	10	49-5911 / 530004.....	24	59-113.....	36
47-2161.....	10	49-5911 / 810.....	24	59-211.....	36
47-2171.....	10	49-59111.....	22	59-212.....	36
48-1.....	12	49-59112.....	22	59-213.....	36
48-2.....	12	49-59113.....	22	59-311.....	36
48-3.....	14	49-5912 / 530004.....	24	59-312.....	36
48-4.....	14	49-5912 / 810.....	24	59-313.....	36
48-5.....	12	49-5913 / 530004.....	24	65-201000.....	64
48-6.....	12	49-5913 / 810.....	24	65-301000.....	64
48-7.....	14	49-59211.....	22	65-401000.....	64
48-8.....	14	49-59212.....	22	71-1040 .....	46, 68
48-A .....	12	49-59213.....	22	71-2010 .....	46, 68
48-B .....	12	49-611.....	20	72-1160 .....	58, 71
48-C .....	14	49-612.....	20	72-2080 .....	58, 71
48-D .....	14	49-613.....	20	76-1200 .....	50, 52, 60, 62, 69, 72
48M-1.....	16	49-9111.....	20	76-1210 .....	50, 52, 60, 62, 69, 72
48M-2.....	16	49-9113.....	20	76-1220 .....	50, 52, 60, 69, 72
48M-3.....	18	57-111.....	26	76-22604 .....	50, 52, 60, 69, 72
48M-4.....	18	57-112B .....	26	76-59200.....	38
48M-5.....	16	57-112G .....	26	76-59300.....	38
48M-6.....	16	57-112R .....	26	76-6005.....	66
48M-7.....	18	57M-1.....	28	76-9510/530004 .....	40
48M-8.....	18	57M-2.....	28	76-9510/810.....	40
48M-A .....	16	57M-3.....	30	76-9711/4044X.....	42
48M-B .....	16	57M-4.....	30	76-9711/804X.....	42
48M-C .....	18	57M-5.....	28	76-9712/4044X.....	42
48M-D .....	18	57M-6.....	28	76-9712/804X.....	42
49-111.....	20	57M-7.....	30	78-3000 .....	54, 70
49-112.....	20	57M-8.....	30	78-3100 .....	54, 70
49-113.....	20	57M-A .....	28	80-390101.....	4
49-131.....	20	57M-B .....	28	80-390102.....	4
49-132.....	20	57M-C .....	30	80-390103.....	4
49-133.....	20	57M-D .....	30	80-390106.....	4
49-411G .....	20	58M-A .....	32	80-390107.....	4
49-411R .....	20	58M-B .....	32	80-390108.....	4
49-412G .....	20	58M-C .....	34	80-390111.....	4
49-412R .....	20	58M-D .....	34		