






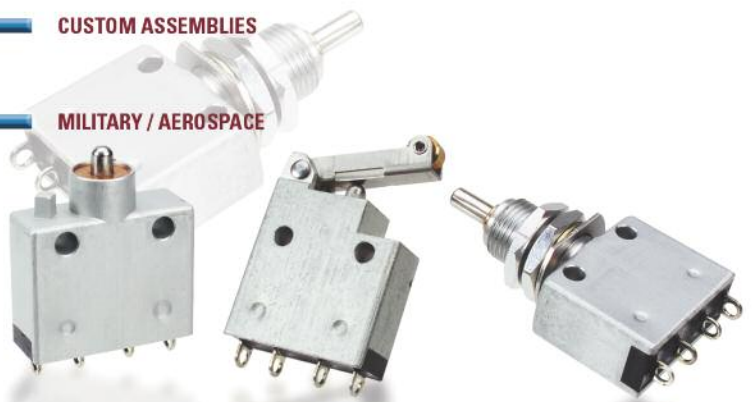
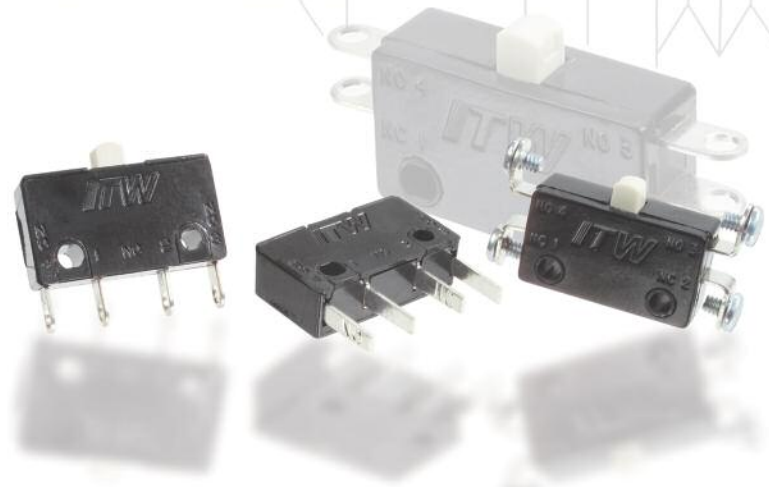


Product Catalog

Design, development and manufacture of switch solutions

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



ITW Switches
SENSORS, SWITCHES, ELECTRONIC CONTROLS

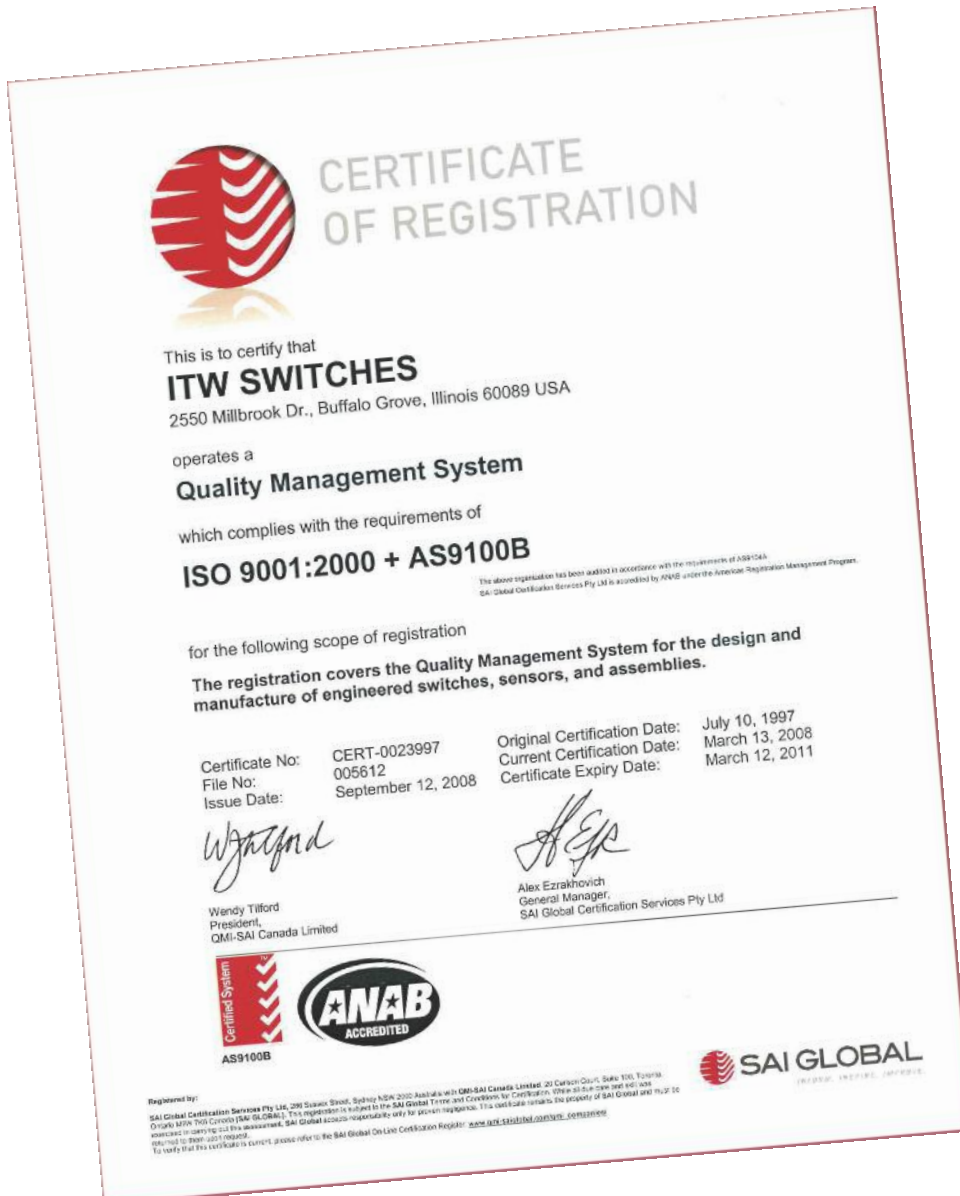


WWW.ITWSWITCHES.COM

800.544.3354

ITW Switches

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800.544.3354 • 847.876.9400 • 847.876.9440 (Fax)
www.itwswitches.com



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www.itwswitches.co.uk

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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 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

Visit our website at www.itwswitches.com or email us at 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.

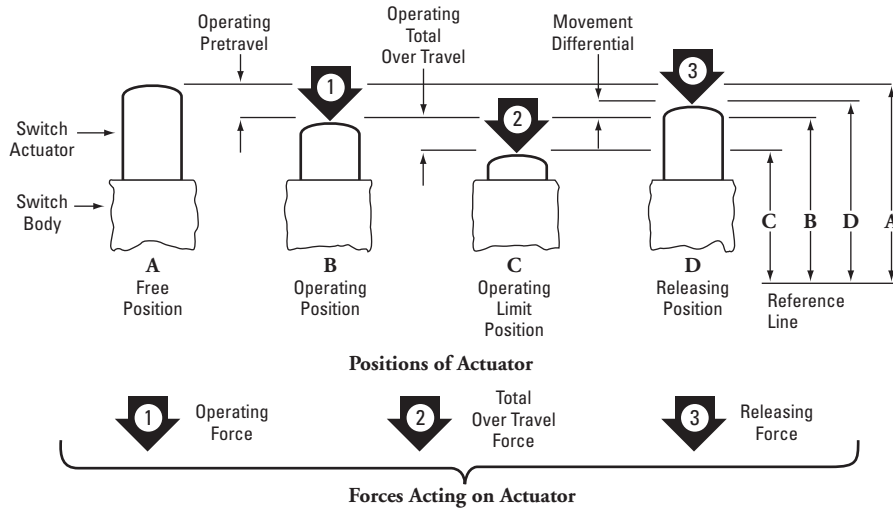
COST CONTAINMENT

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

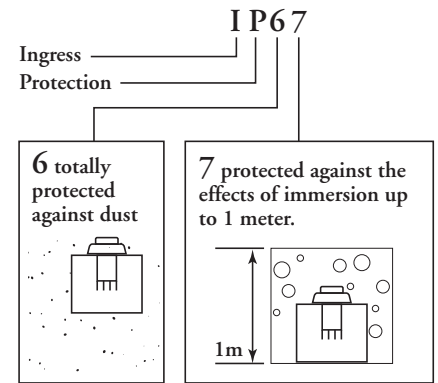
FINANCIAL STABILITY

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.

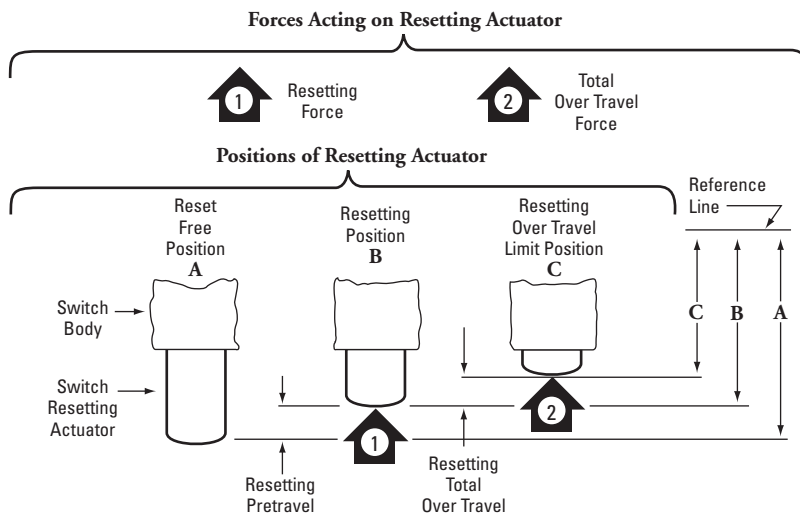
MOMENTARY CONTACT SWITCH



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

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

ITW SWITCHES SEALED IP67 PUSHBUTTONS

Design, development and manufacture of switch solutions

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



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SEALED IP67 PUSHBUTTON SWITCHES

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Series 034

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



ACTUAL SIZE

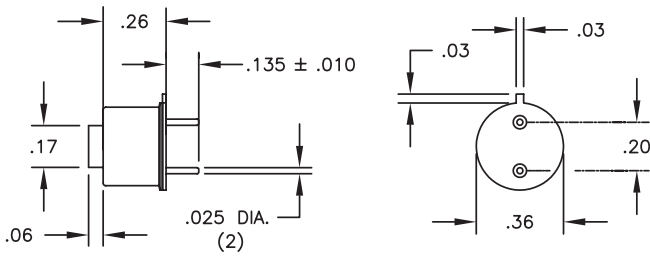
ORDERING INFORMATION:

Part Number	Button Height
034-550-001	0.06
034-550-002	0.50
034-550-005	0.15
034-550-006	0.25
034-550-010	0.37
034-550-015	0.19

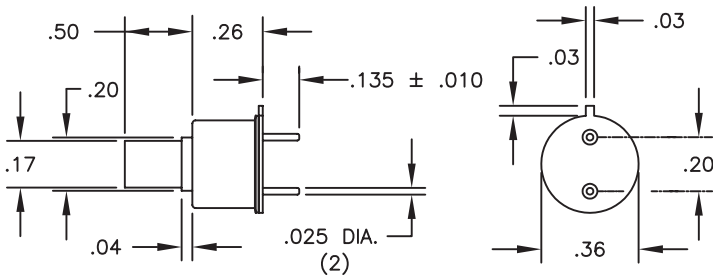
STANDARDS / AGENCY / RATINGS:



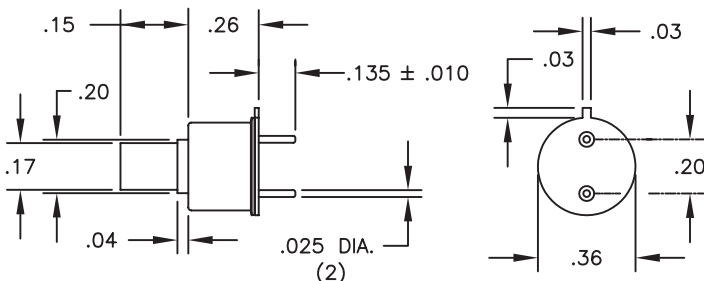
034-550-001



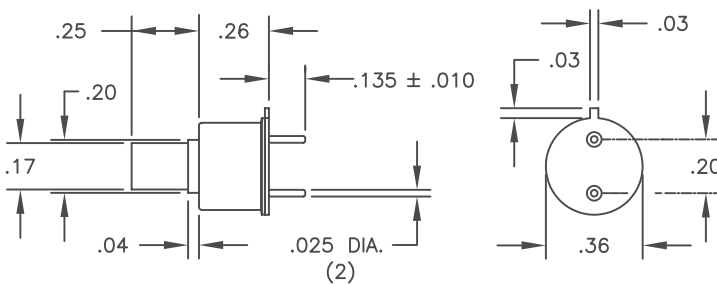
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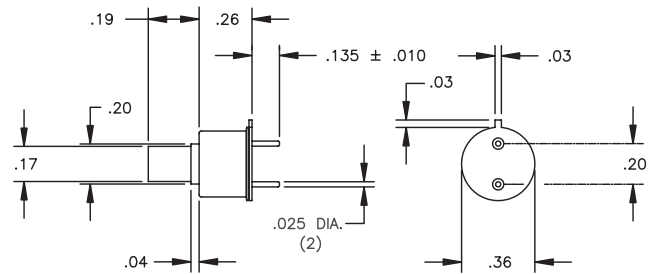
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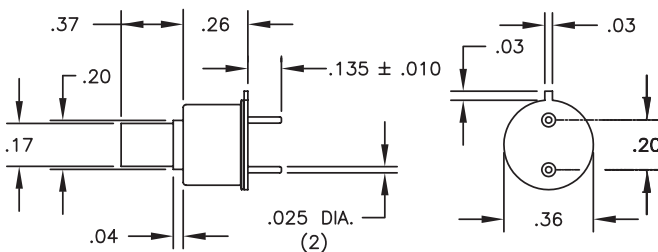
034-550-006



034-550-015



034-550-010



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)

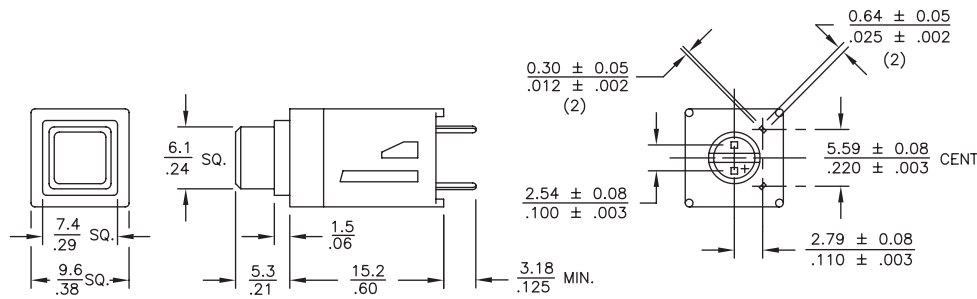
Connectors

Part Number	Mount
39-800001	In-Line

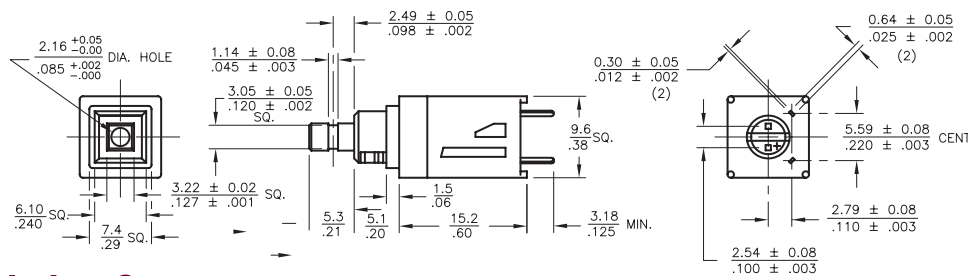
STANDARDS / AGENCY / RATINGS:



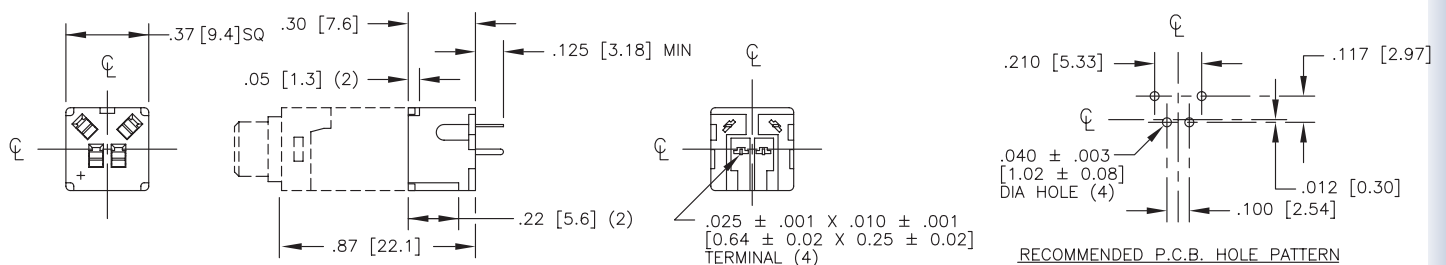
STANDARD BUTTON STYLE



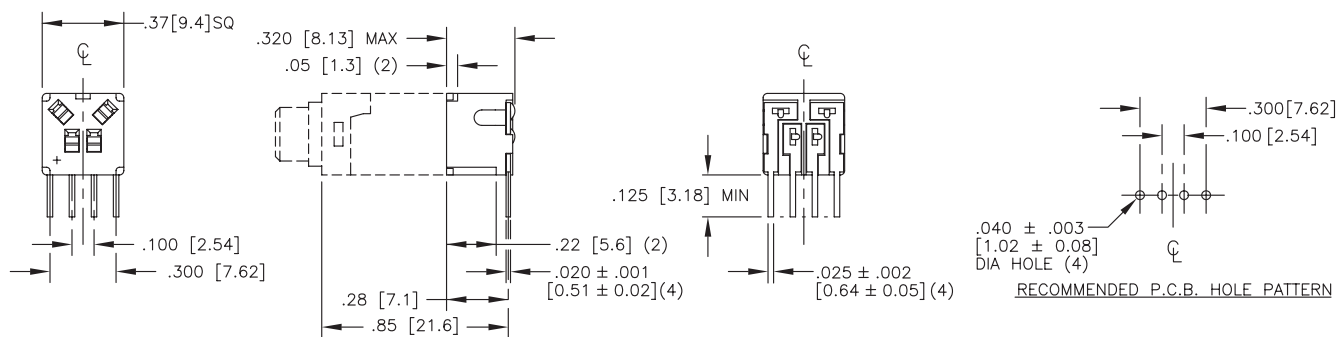
KEYCAP BUTTON STYLE



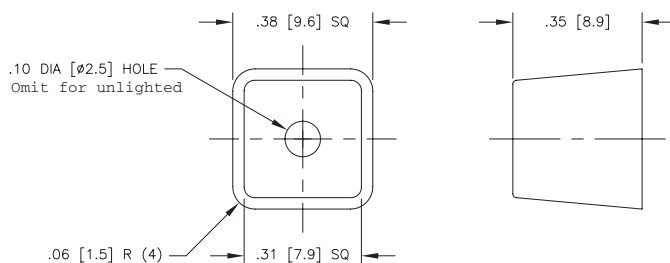
IN-LINE CONNECTOR



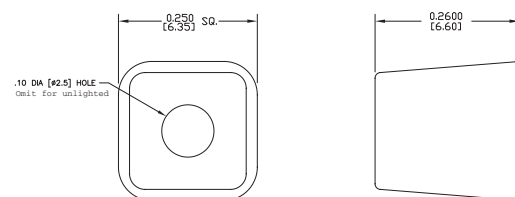
RIGHT ANGLE CONNECTOR



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

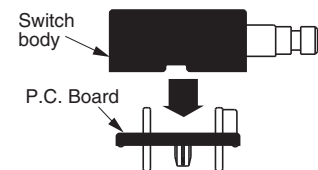
- Control panel assemblies
- Recording equipment
- Telecom switching systems
- Scientific instrumentation
- Telecom test gear

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

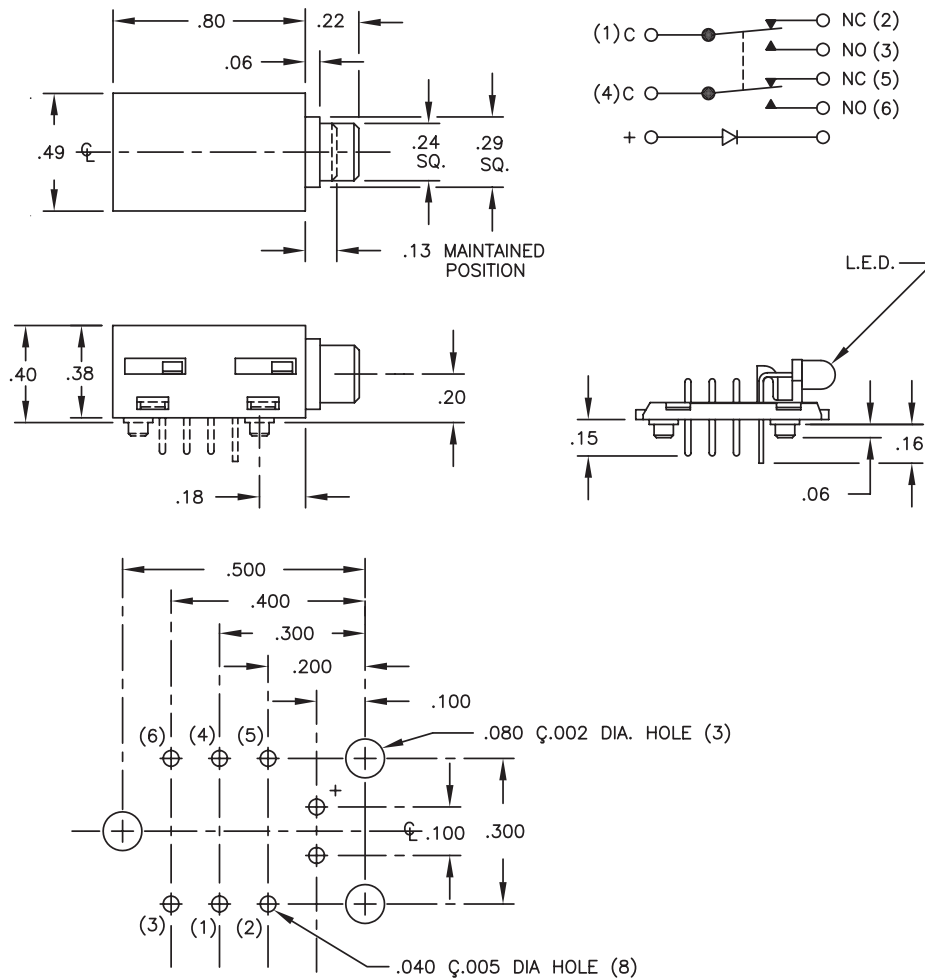
Part Number	LED Color *	Action
39-522101	—	Momentary
39-522701	Yellow	Momentary
39-523101	—	Maintained
39-523501	Red	Maintained

* 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.

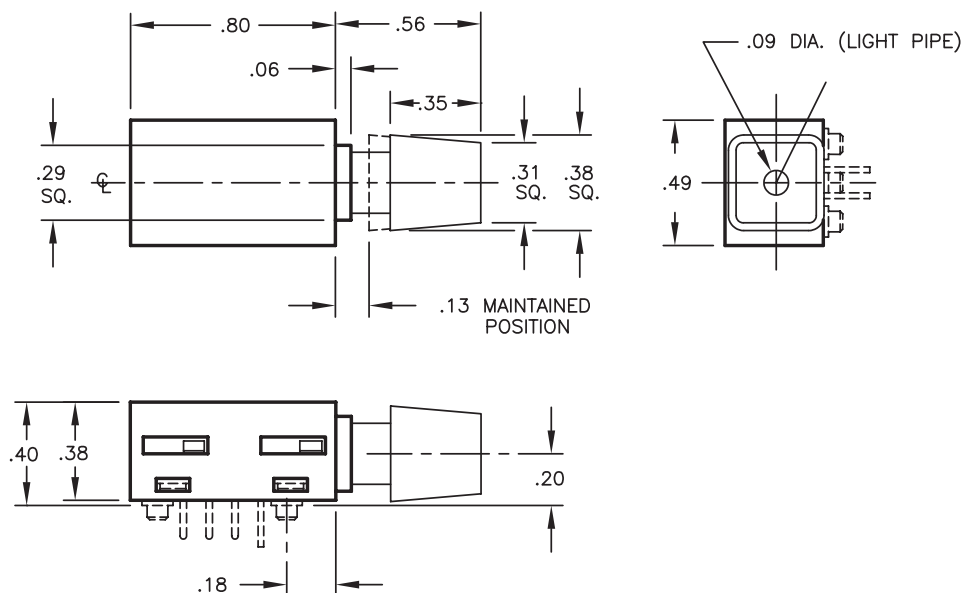
Insulation resistance:
1000 MΩ min.
@ 500 VDC

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



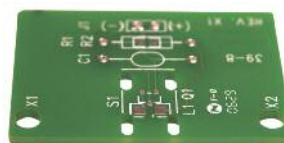
ACTUAL SIZE

ORDERING INFORMATION:

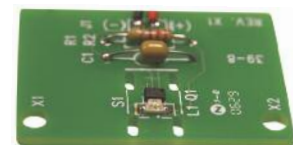
Switches

Part Number	Action	Polarity
39-82N	Momentary	North
39-82S	Momentary	South
39-83N	Maintained	North
39-83S	Maintained	South

①—Customer Designed PCB



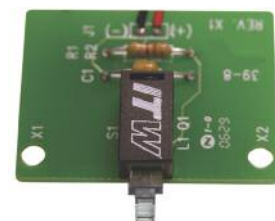
②—Customer Loaded PCB



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



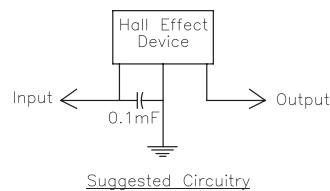
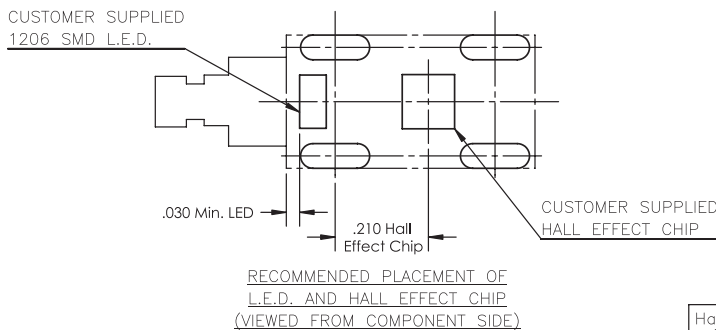
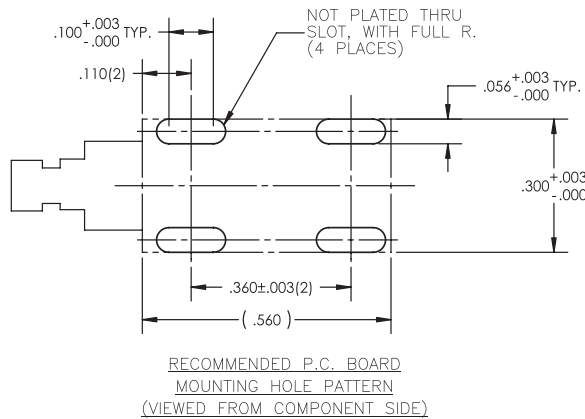
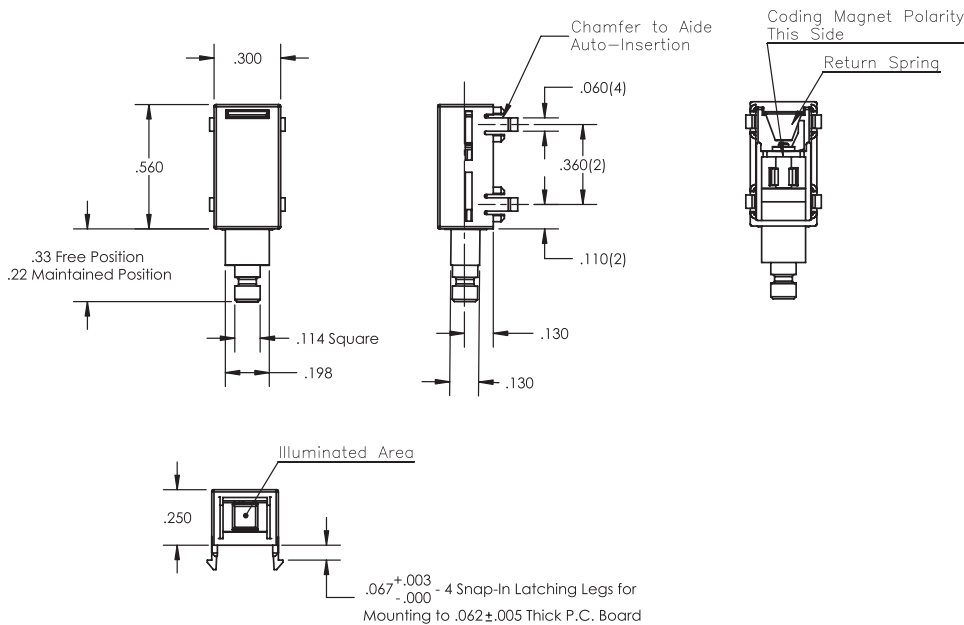
④—Complete Assembly



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

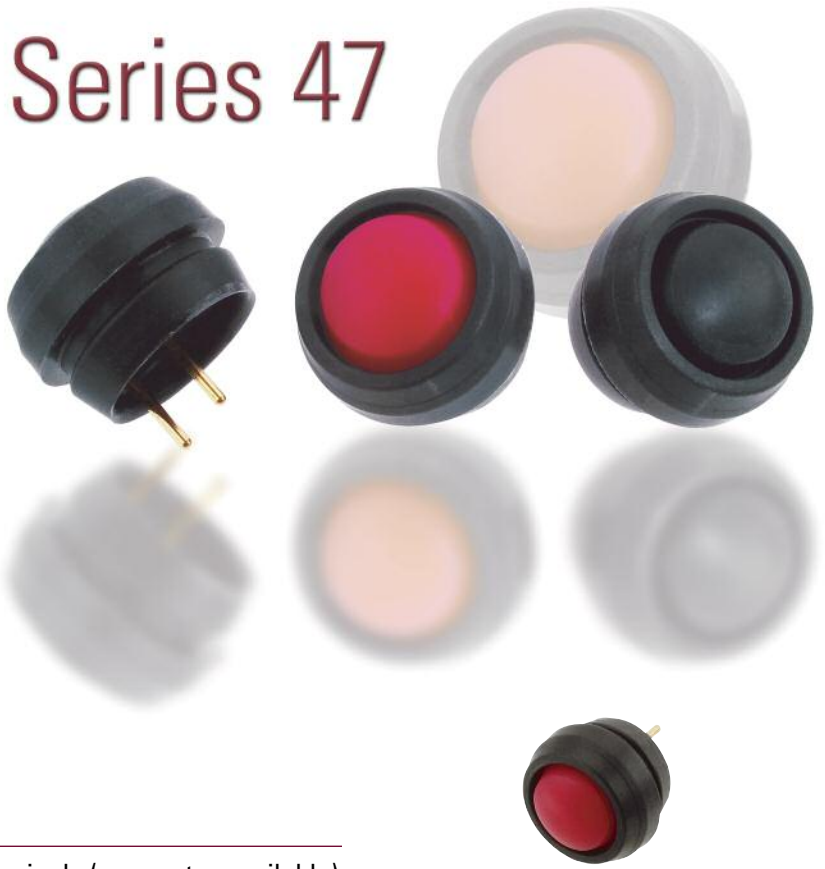
P/N A3280ELHLT,

customer supplied)

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

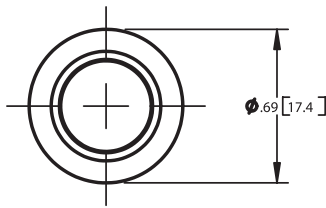
ORDERING INFORMATION:

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	✓	

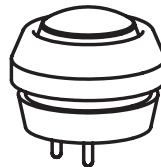
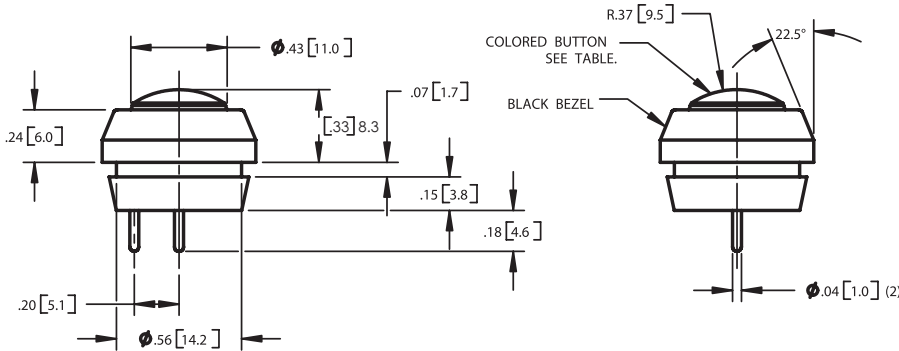
STANDARDS / AGENCY / RATINGS:



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	48-1	RB - Round, Black	N - None	RD - Red	B - Bushing	If Blank*
Maintained	Solder Tabs	48-2	SB - Square, Black	R - Red	GR - Green	S - Snap-fit	05 - 5V forward
Momentary	PC	48-5	RC - Round, Chrome	G - Green	BK - Black		
Maintained	PC	48-6	SC - Square, Chrome	Y - Yellow	BL - Blue		
Momentary	Wire Leads	48-A		A - Amber	YL - Yellow		
Maintained	Wire Leads	48-B		B - Blue	OR - Orange		
				W - White	CR - Chrome		
					PK - Black with Standby Symbol		
					WH - White		

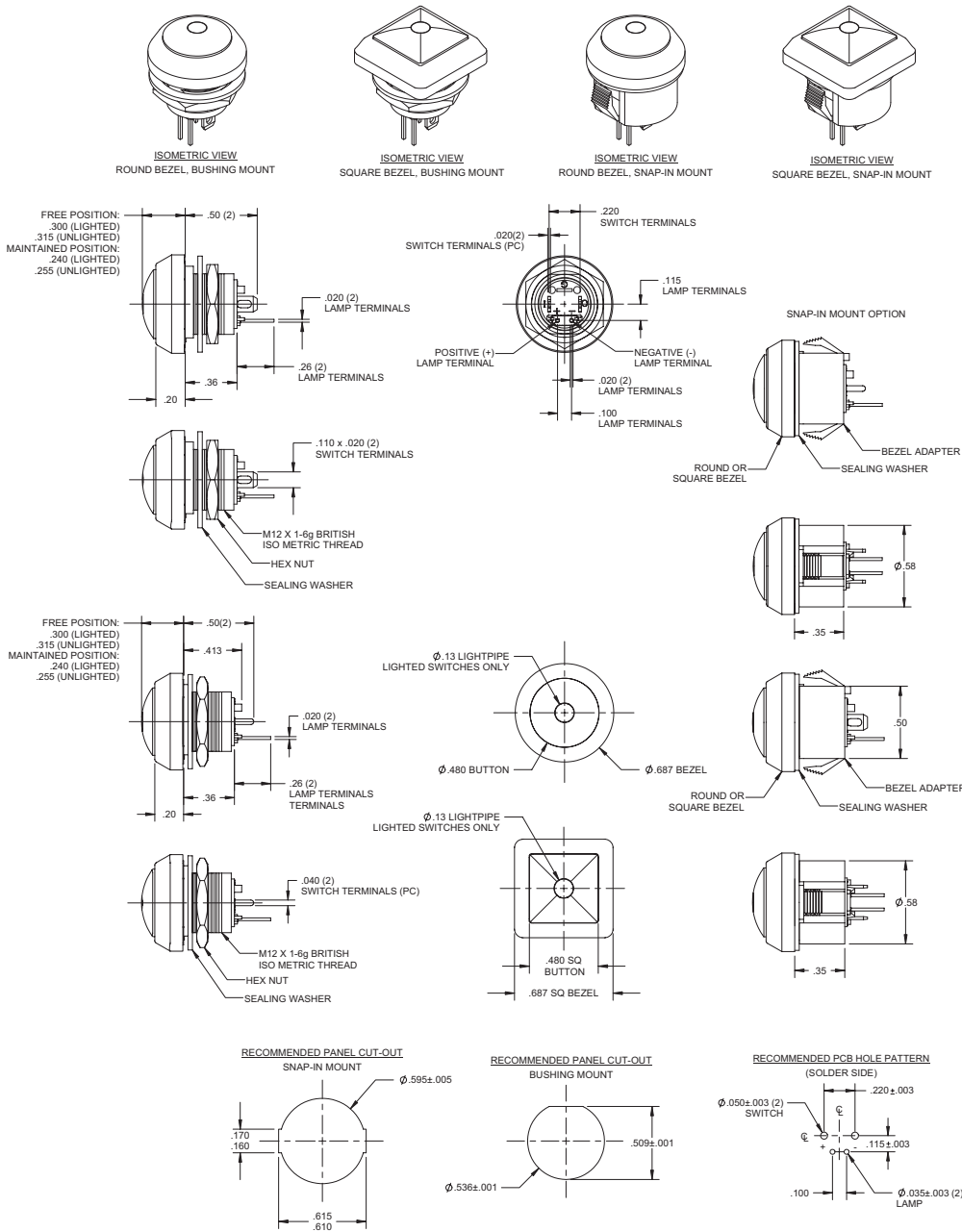
48-

* 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:

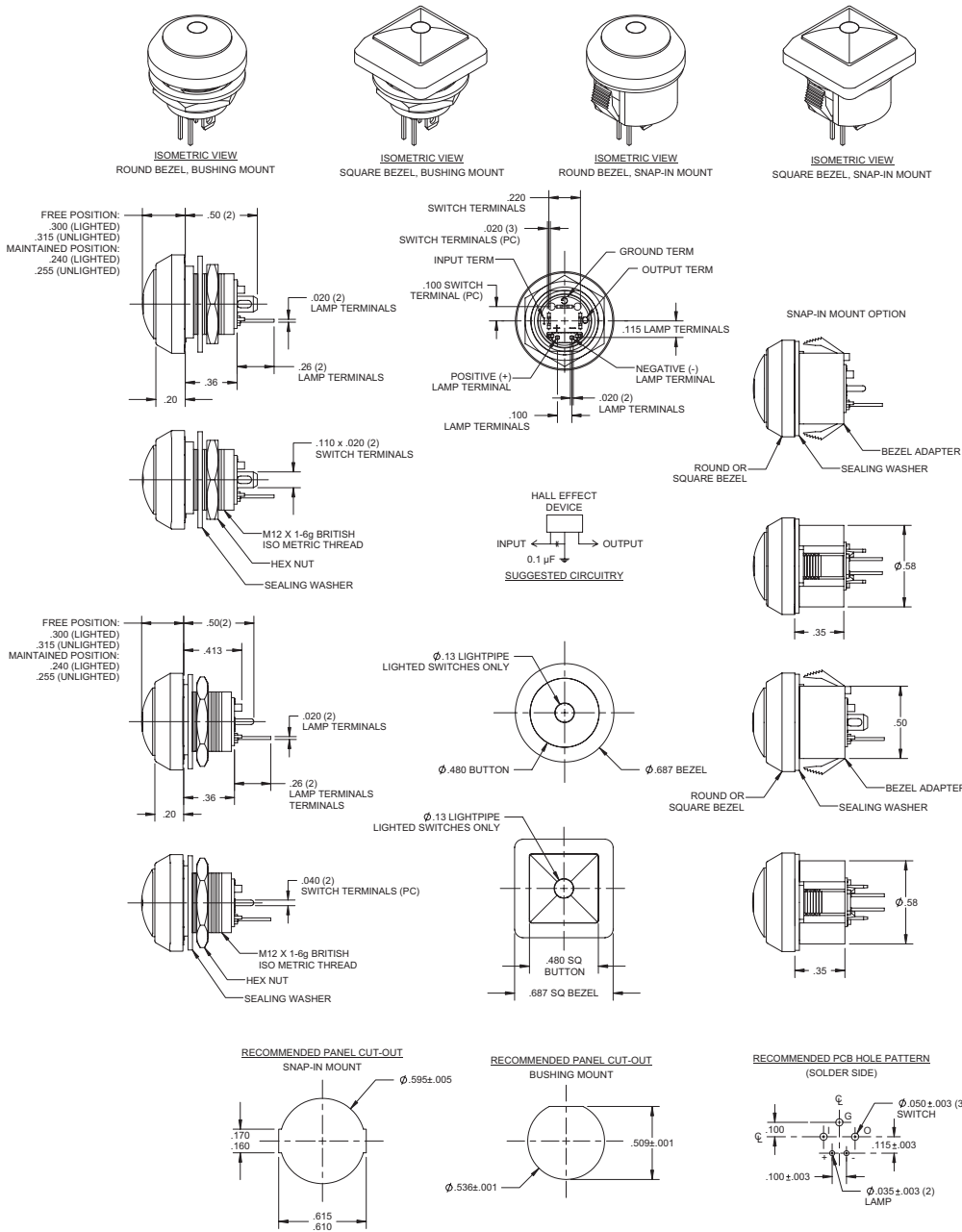
Switch Function	Switch Termination	Module Type	Bezel Type	LED Color	Button Color	Mounting Type	Voltage Resistor
Momentary	Solder Tabs	48-3	RB - Round, Black	N - None	RD - Red	B - Bushing	If Blank*
Maintained	Solder Tabs	48-4	SB - Square, Black	R - Red	GR - Green	S - Snap-fit	05 - 5V forward
Momentary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

* 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

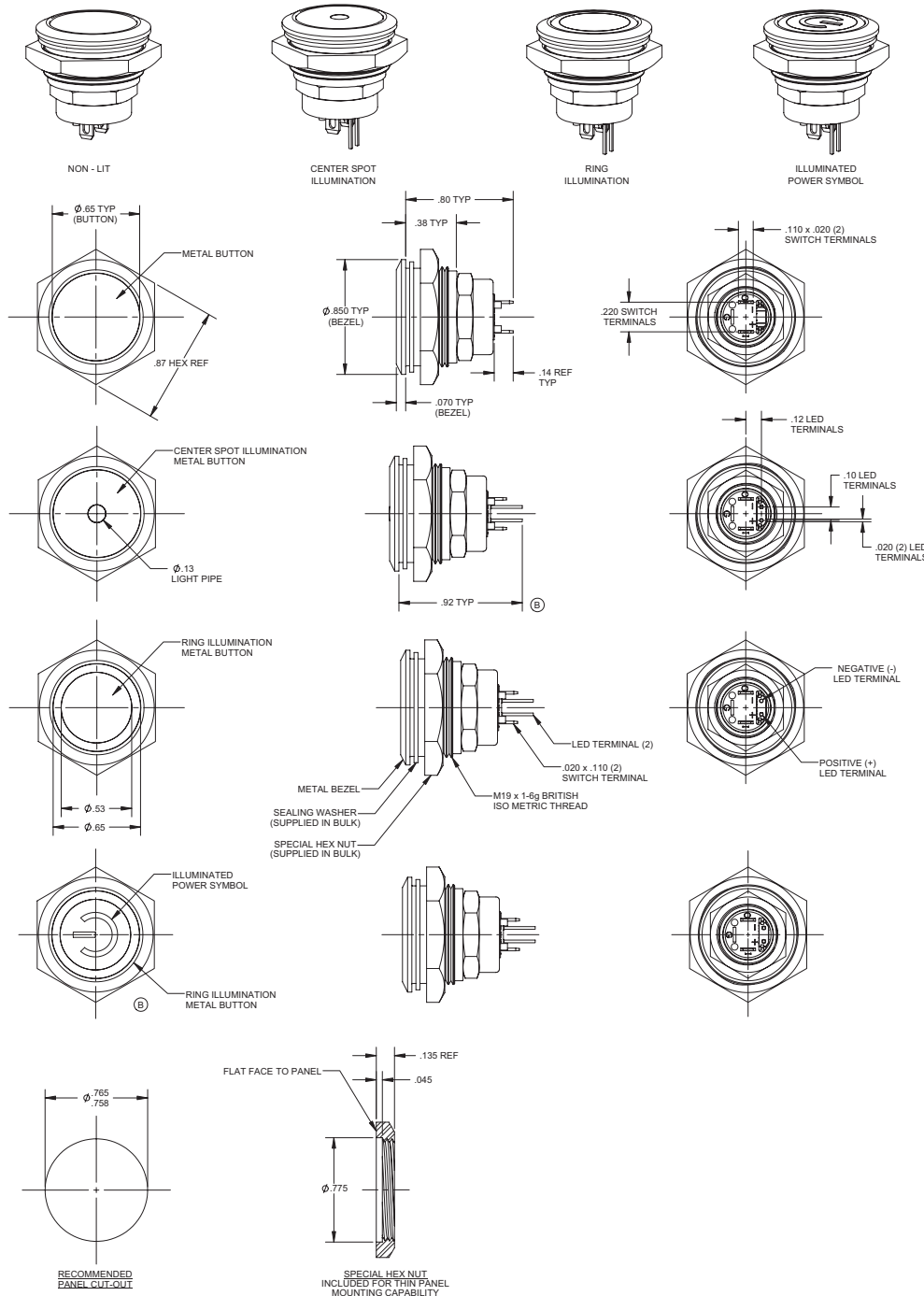
48M-

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

STANDARDS / AGENCY / RATINGS:



PRODUCT DRAWINGS



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)

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 brass hex nut tightened down to a torque of 10 inch pounds to achieve the correct sealing pressure.

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
- Solid State
- Stainless Steel Housing
- Panel Sealed to IP67
- Center Spot or Ring Illumination
- ROHS Compliant
- Variety of LED colors
- 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

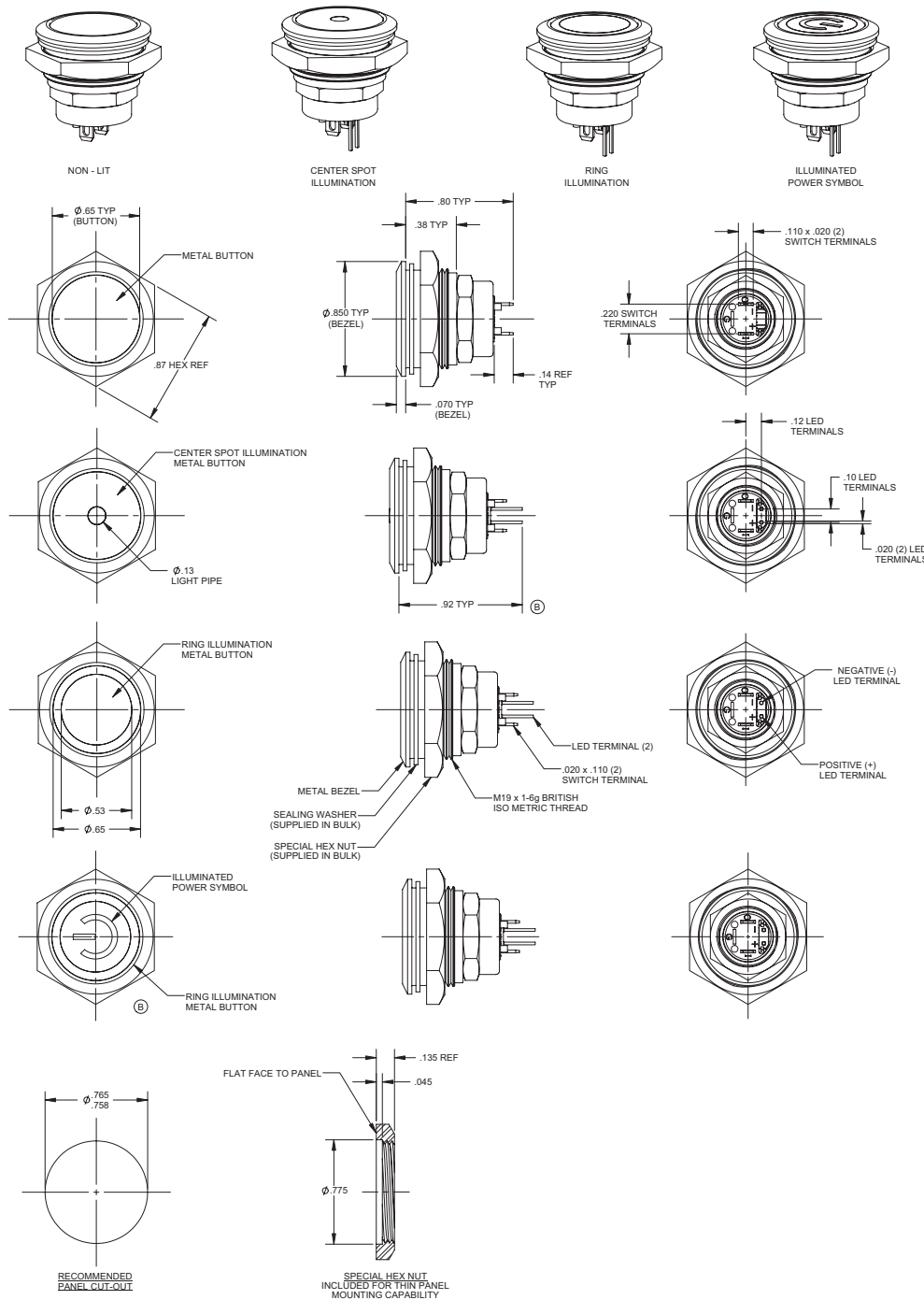
48M-

* 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, V_{cc}=12V: 3mA Typ.
To 8mA Max.
B>Bop, V_{cc}=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 brass 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

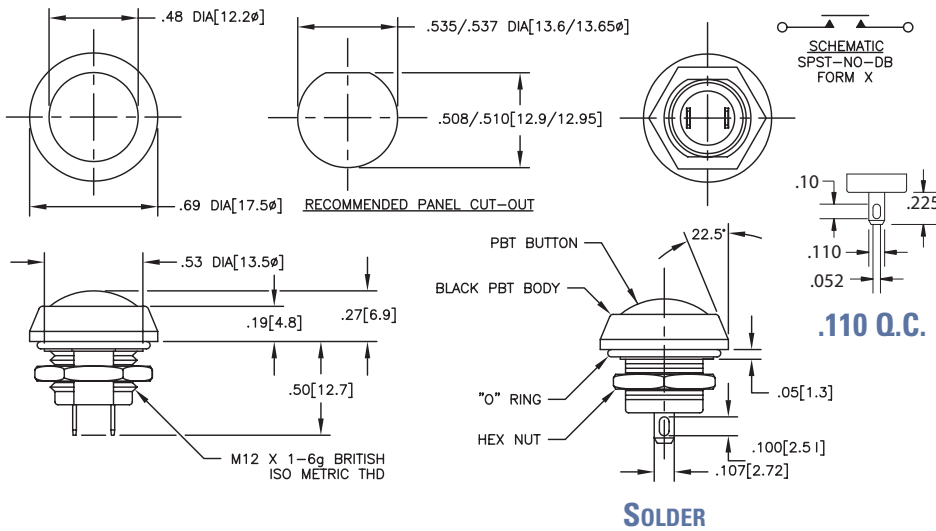
ORDERING INFORMATION:

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

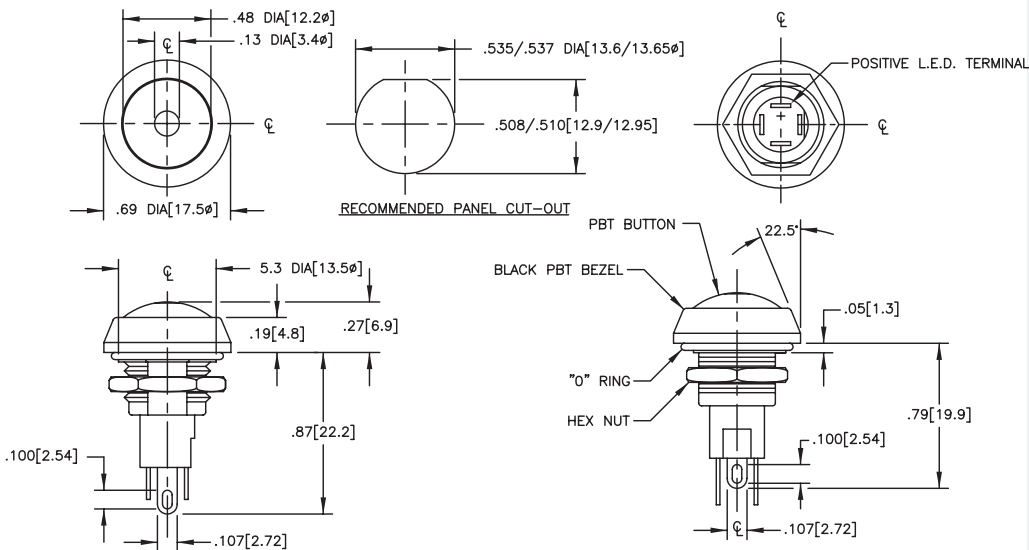
STANDARDS / AGENCY / RATINGS:



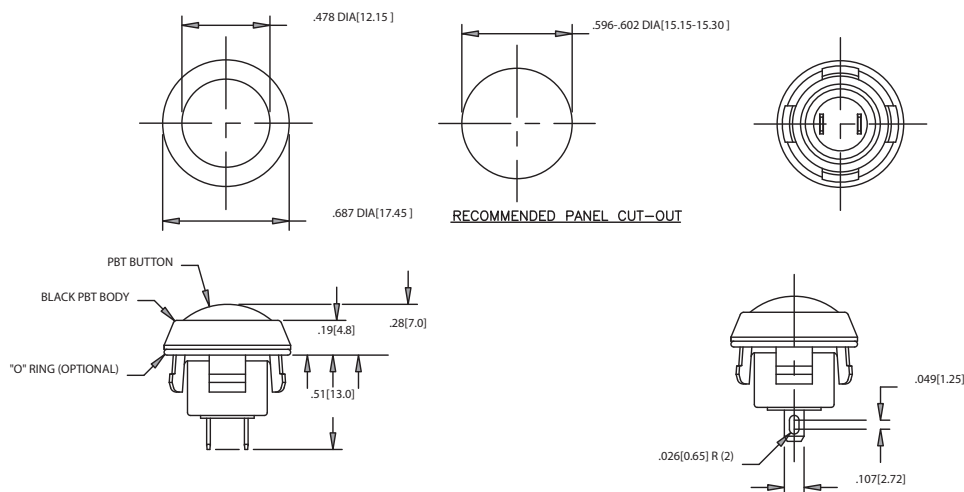
49-11X & 49-61X SERIES



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

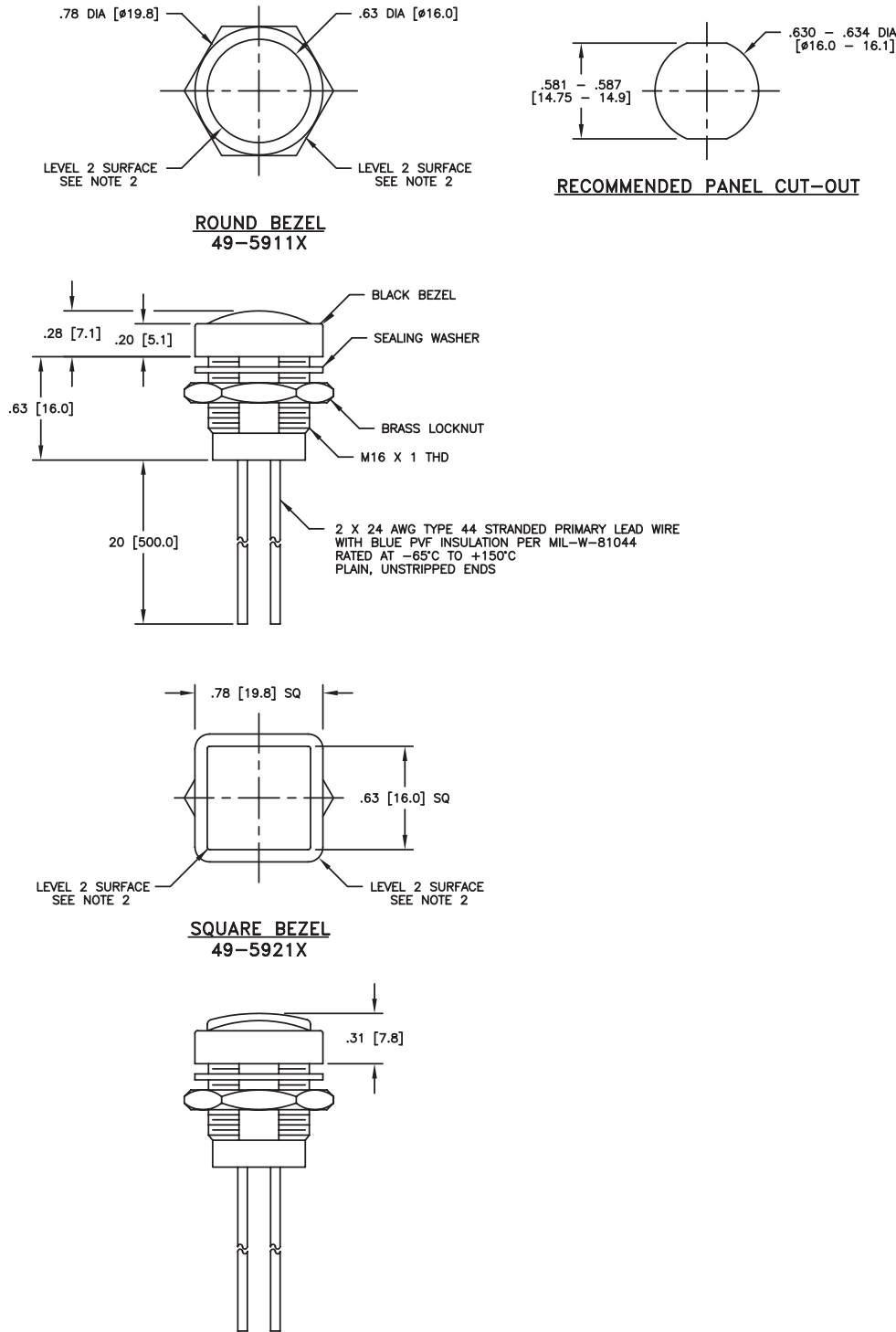
ORDERING INFORMATION:

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

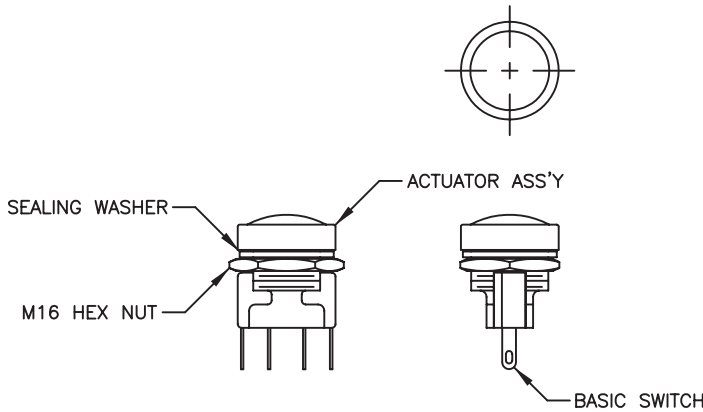
ORDERING INFORMATION:

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

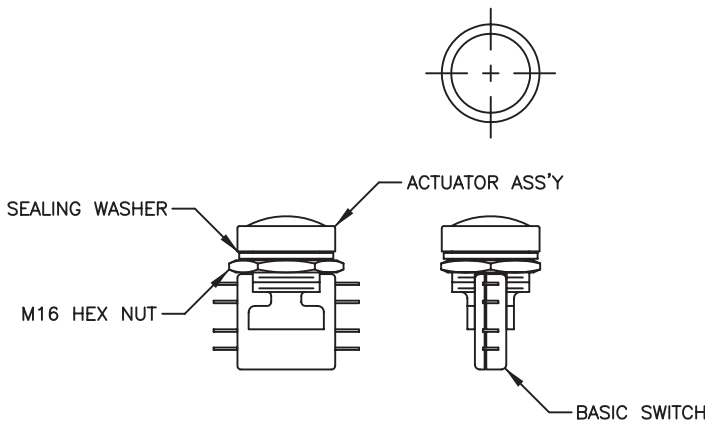
STANDARDS / AGENCY / RATINGS:



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

Series 57

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



ACTUAL SIZE

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

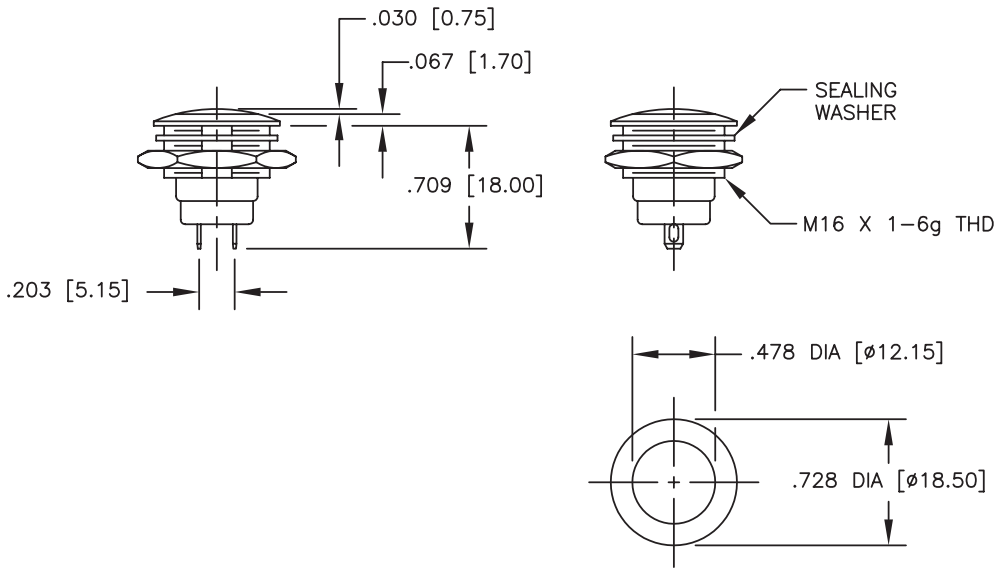
ORDERING INFORMATION:

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

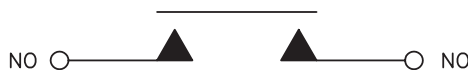
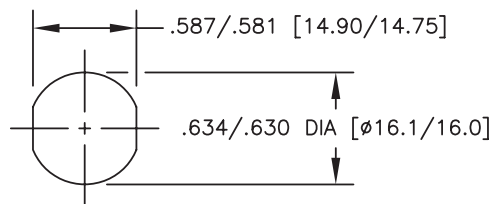
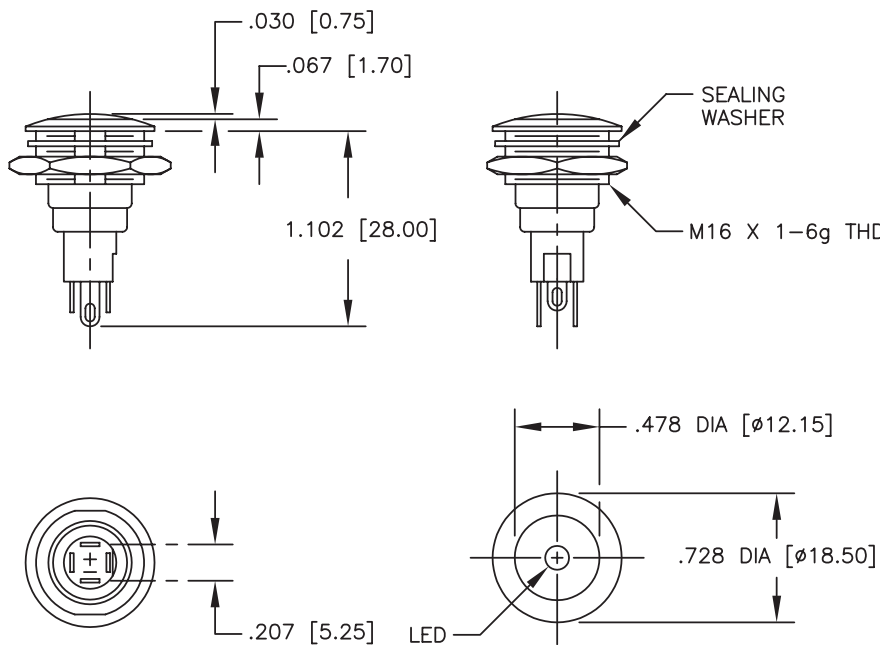
STANDARDS / AGENCY / RATINGS:



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

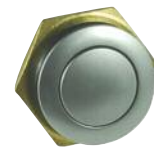
Terminals:
gold plated brass

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

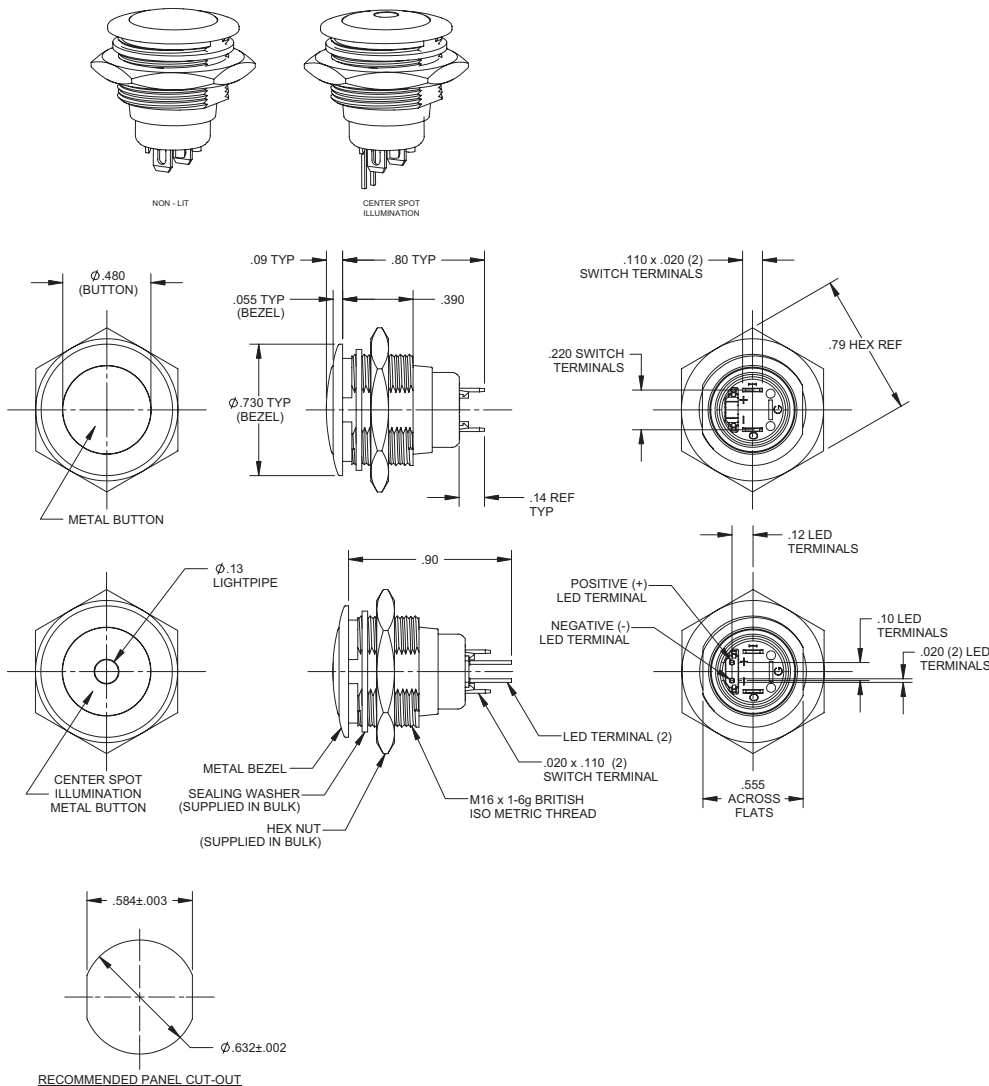
57M-

* 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 brass 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

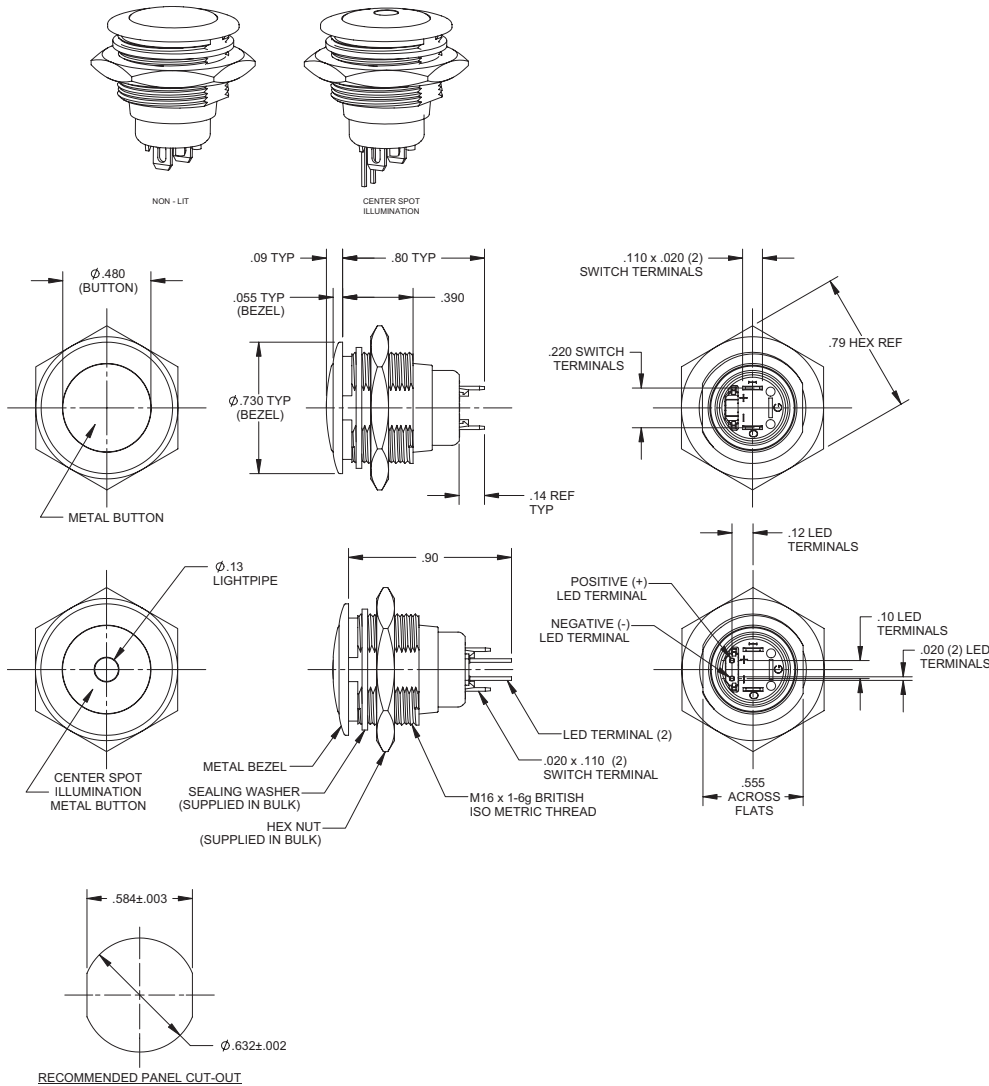
57M-

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

STANDARDS / AGENCY / RATINGS:



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

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 brass hex nut tightened down to a torque of 10 inch pounds to achieve the correct sealing pressure.

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
A. MECHANICAL, MOMENTARY, WIRE LEADS	1. STAINLESS STEEL	0. NON-LIT	N. NONE	IF BLANK *
B. MECHANICAL, MAINTAINED, WIRE LEADS	2. ALUMINUM	2. RING ILLUMINATION	G. GREEN	05 5V FORWARD
		R. RED, NON-LIT	R. RED	12 12V FORWARD
			B. BLUE	24 24V FORWARD
			W. WHITE	
			RB. RED / BLUE	
			RG. RED / GREEN	
			BG. BLUE / GREEN	

58M-

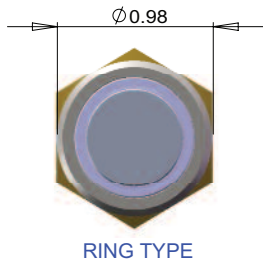
* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

STANDARDS / AGENCY / RATINGS:

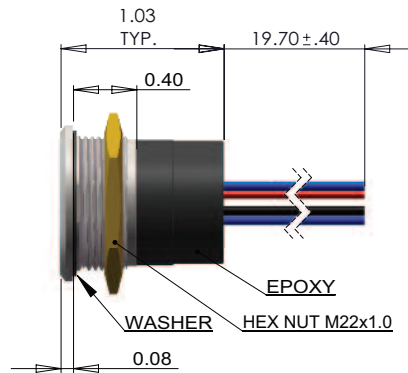


PRODUCT DRAWINGS

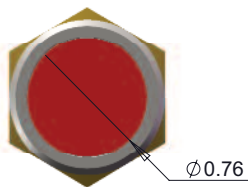
ILLUMINATION



RING TYPE



NON-ILLUMINATION

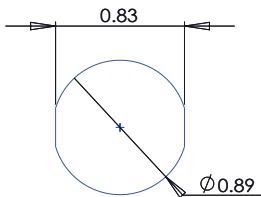


COLORLED TYPE



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 brass 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.

APPLICATIONS

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



ACTUAL SIZE

KEY FEATURES:

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

ORDERING INFORMATION:

SWITCH FUNCTION:

C. SOLID STATE, , MOMENTARY, WIRE LEADS

D. SOLID STATE, , MAINTAINED, WIRE LEADS

HOUSING MATERIAL:

1. STAINLESS STEEL

2. ALUMINUM

BUTTON STYLE:

0. NON-LIT

2. RING ILLUMINATION

R. RED, NON-LIT

LED COLOR:

N. NONE

G. GREEN

R. RED

B. BLUE

W. WHITE

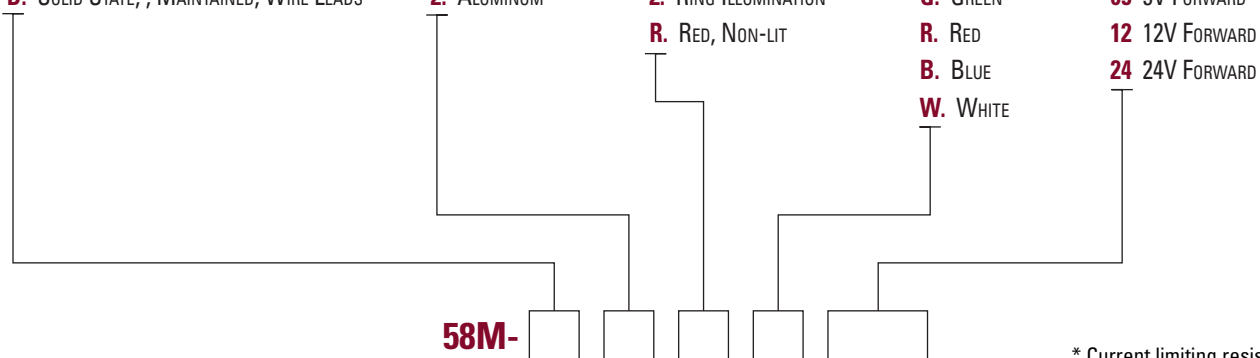
VOLTAGE RESISTOR

IF BLANK *

05 5V FORWARD

12 12V FORWARD

24 24V FORWARD



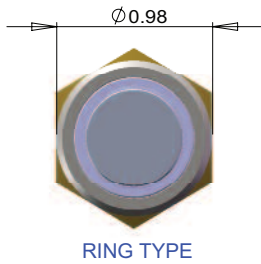
* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

STANDARDS / AGENCY / RATINGS:

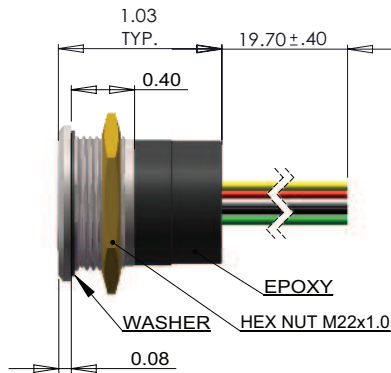


PRODUCT DRAWINGS

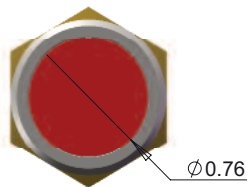
ILLUMINATION



RING TYPE



NON-ILLUMINATION

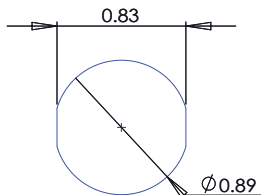


COLORLED TYPE



NON-LIT. TYPE

RECOMMENDED PANEL CUTOUT



WIRELEADS DESCRIPTION

WIRELEADS TYPE	WIRELEADS SPECIFICATION	SW TERMINAL			LED	
		I	O	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_{rp}, V_{cc}=12V: 3mA Typ.

To 8mA Max.

B > B_{op}, V_{cc}=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 brass 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°C to +125°C

ORDERING INFORMATION:

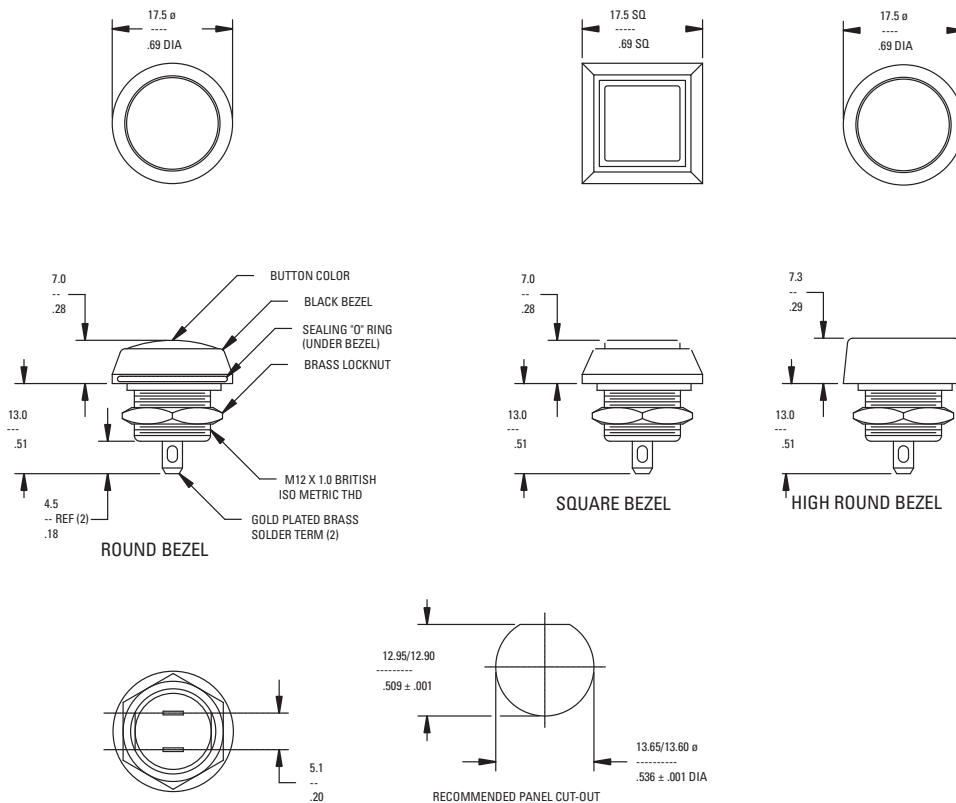
Part Number	Bezel Style	Button Color*
59-111	Round	Black
59-112	Round	Red
59-113	Round	Green
59-211	Square	Black
59-212	Square	Red
59-213	Square	Green
59-311	High Round	Black
59-312	High Round	Red
59-313	High Round	Green

*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 brass 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

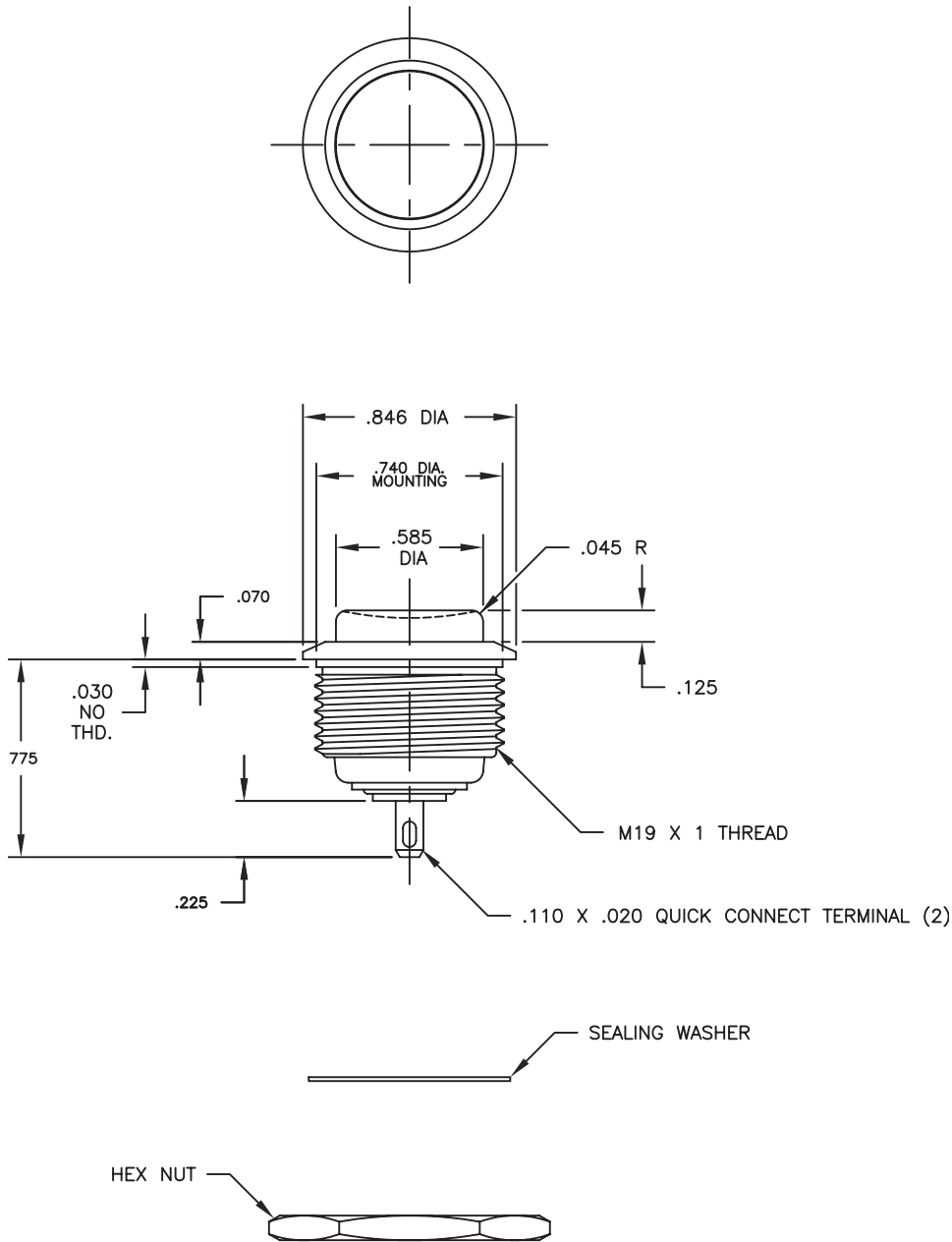
ORDERING INFORMATION:

Part Number	Bushing	Button
76-59200	Stainless steel	Raised concave stainless steel
76-59300	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:

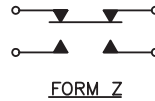
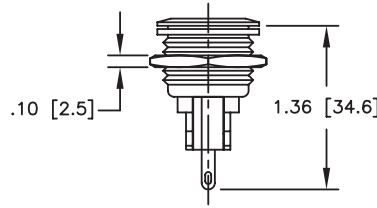
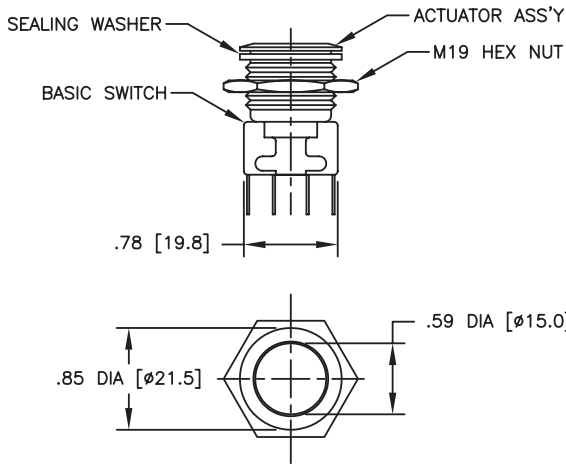
Part Number*	Contacts	Circuit
76-9510/530004	Silver	SPDT-DB
76-9510/810	Enhanced Gold	DPDT-DB

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

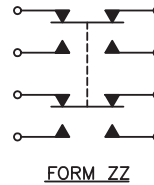
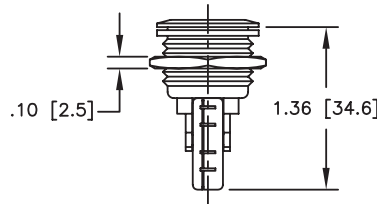
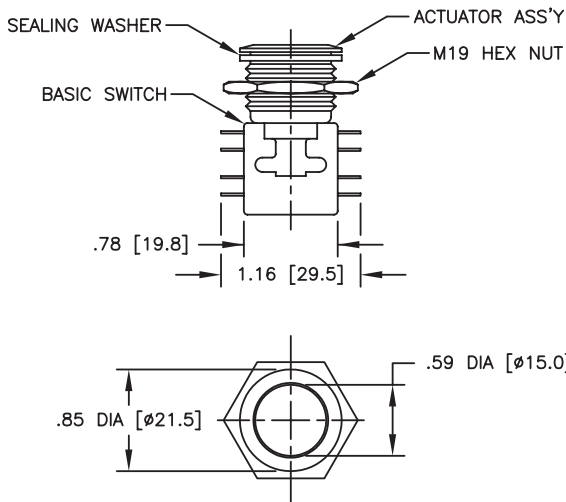
STANDARDS / AGENCY / RATINGS:



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:

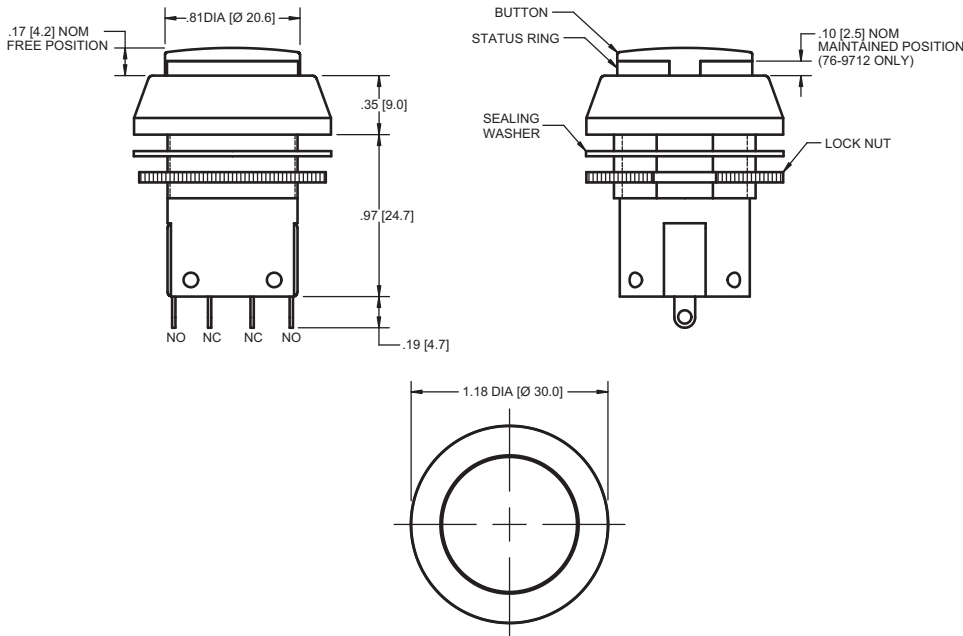
- PCB terminals
- Gold contacts
- 2 poles available
- Color variants
- Surface or sublimation legend printing

*For non-standard options, please consult factory.

STANDARDS / AGENCY / RATINGS:



PRODUCT DRAWINGS



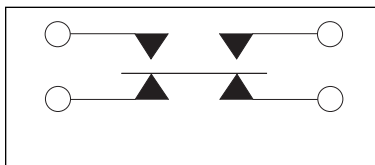
PANEL MOUNTING AND CONSTRUCTION:

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.

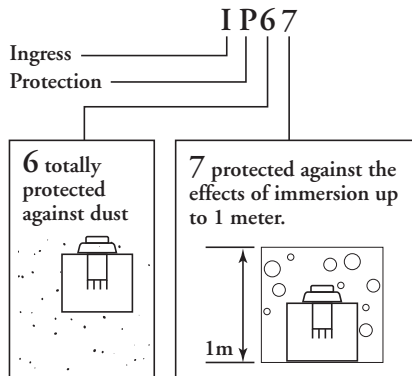
MULTI-POLE INFORMATION:

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 SNAP ACTION SWITCHES

Design, development and manufacture of switch solutions

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



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LICON — SNAP ACTION SWITCHES

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Series 11

MINIATURE 10 AMP DOUBLE-BREAK SNAP ACTION SWITCHES

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



APPLICATIONS

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

KEY FEATURES:

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

ACTUAL SIZE

ORDERING INFORMATION:

Switches

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

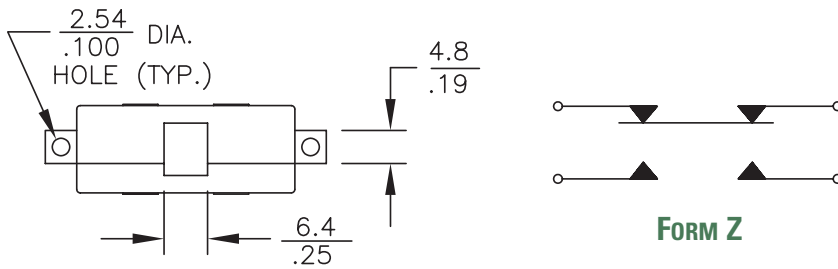
Actuators (see page 68 for additional specifications)

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

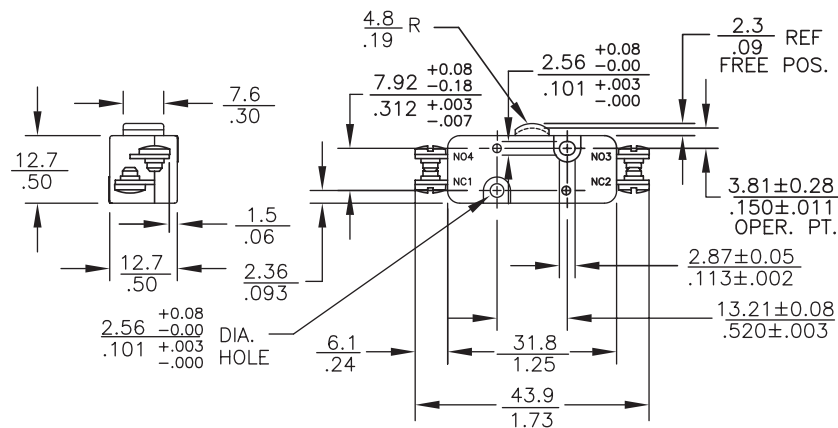
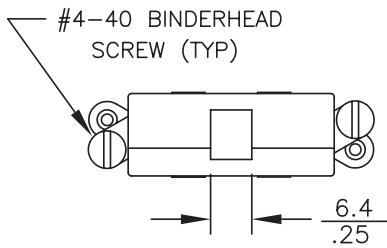
STANDARDS / AGENCY / RATINGS:



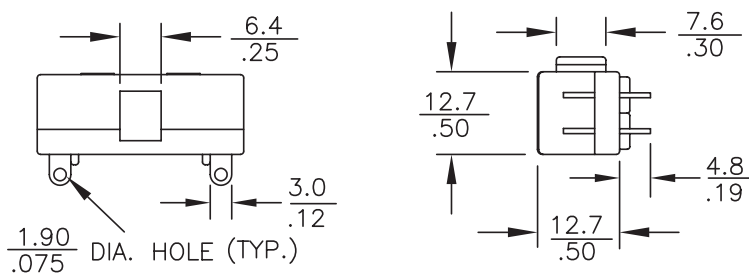
END SOLDER



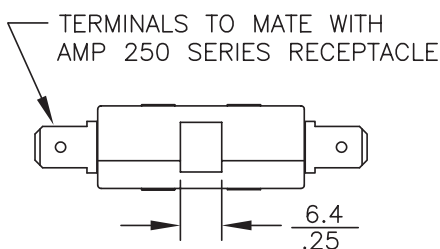
4 SCREW



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:

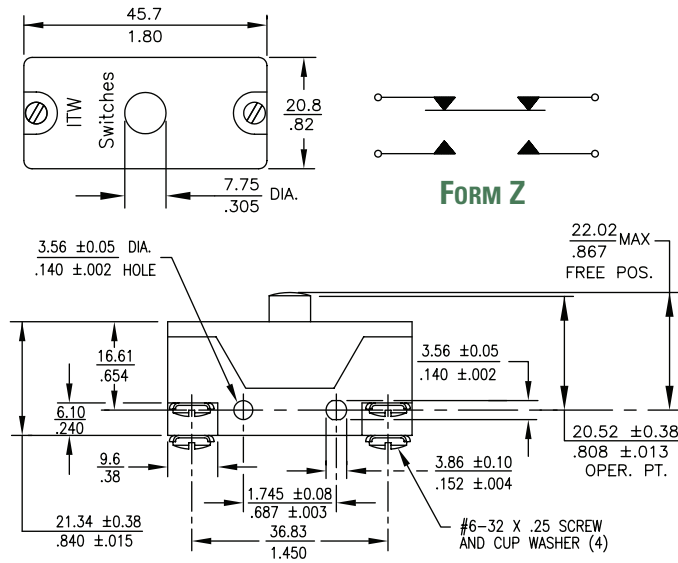
Circuitry	Volts	AC		DC	
		Steady	In-Rush	SPDT	SPST
SPDT-DB(Form Z)	28	20	80	10.0	25.0
SPDT-DB(Form Z)	125	20	80	—	—
SPDT-DB(Form Z)	250	20	80	—	—
SPDT-DB(Form Z)	480	20	50	—	—

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:



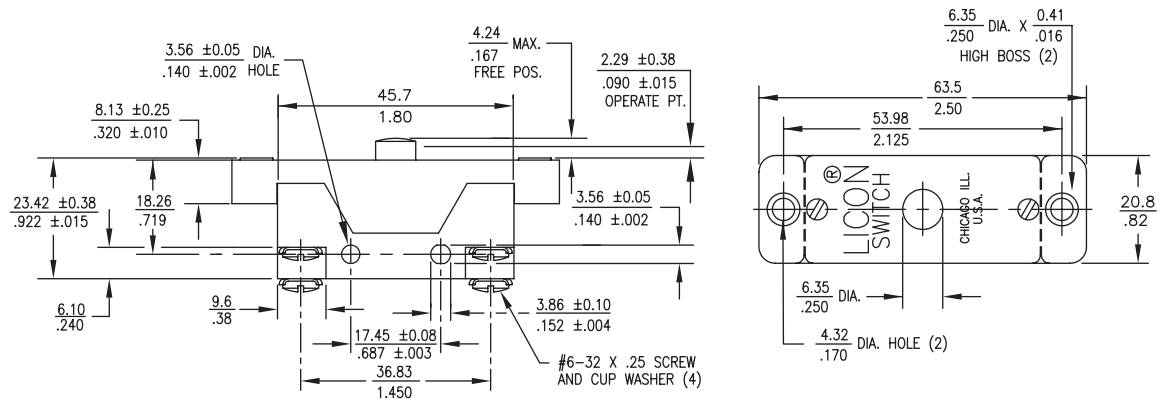
STANDARD BUTTON ACTUATOR



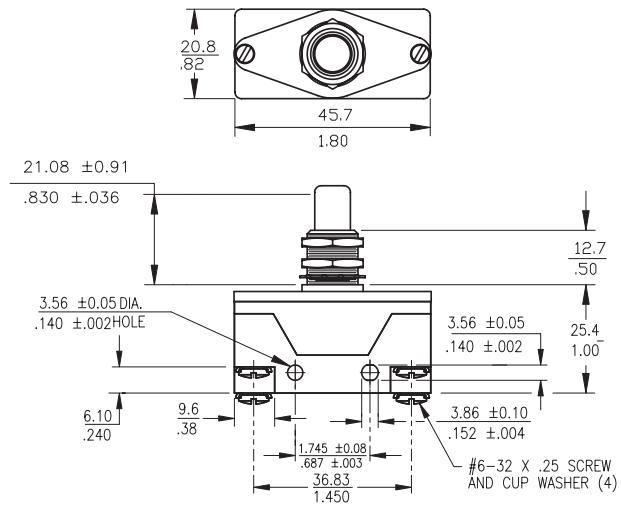
MECHANICAL / ELECTRICAL CHARACTERISTICS:

- Circuit:** SPDT-DB (Form Z)
- Terminal:** #6 screw with cup washer
- Electrical Ratings :** See chart on left

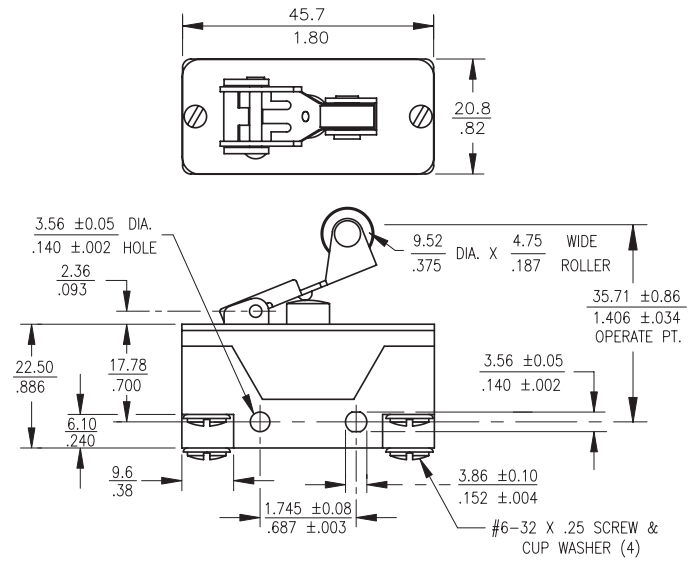
STANDARD BUTTON ACTUATOR—HEAVY DUTY MOUNTING



OVERTRAVEL PANEL MOUNT



ROLLER LEVER



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Series 16

SUB-MINIATURE 10.1 AMP DOUBLE-BREAK SNAP ACTION SWITCHES

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

APPLICATIONS

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

KEY FEATURES:

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

ACTUAL SIZE

ORDERING INFORMATION:

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

* Thermoplastic case and cover.

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

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

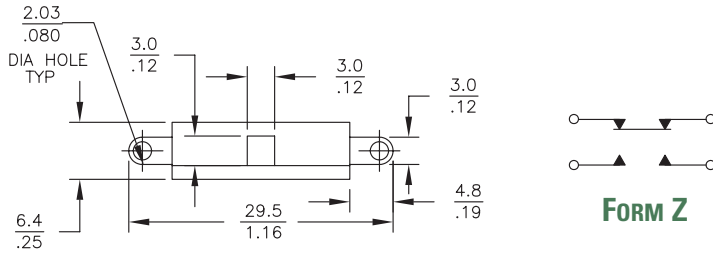
Actuators (see page 69 for additional specifications)

Part Number	Switch Series	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.
76-1200 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	—

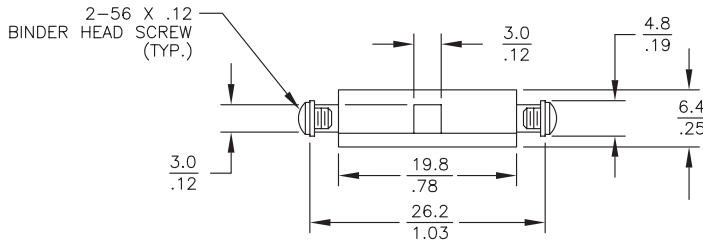
STANDARDS / AGENCY / RATINGS:



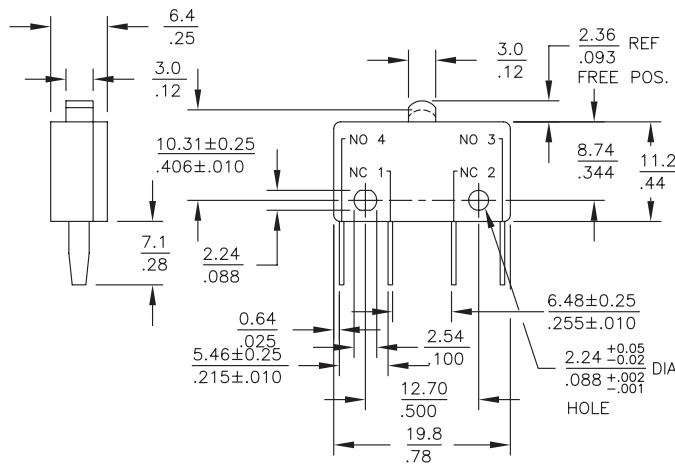
END SOLDER



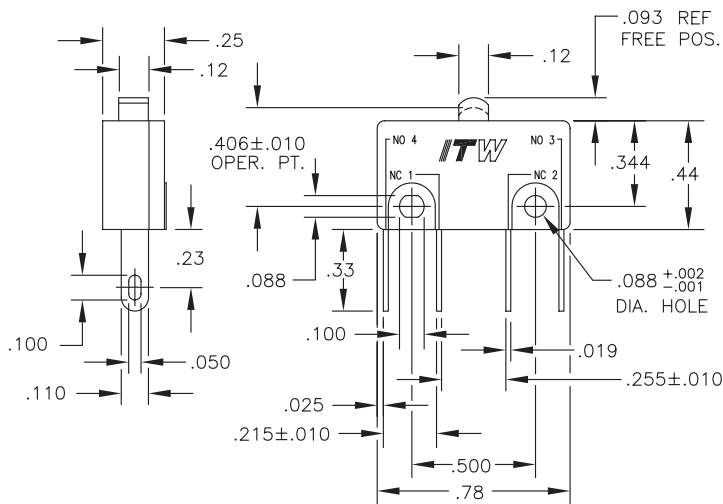
END SCREW



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)

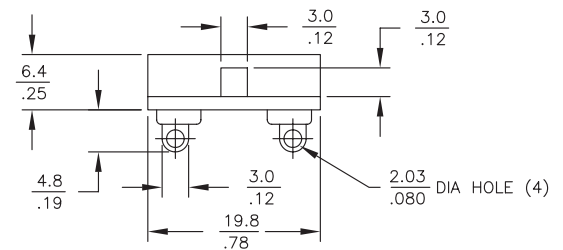
MIL-PRF-8805/7 QPL listed:
16-188051 MS25476-1
16-488051 MS27217-1

Electrical Rating @ 28VDC:

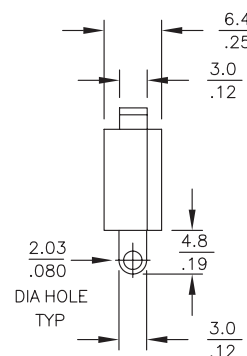
		Sea Level	70,000 Feet
Form Z 2 Circuit	Res	10A	10A
	Ind*	5A	2A
	Lamp	3A	—

*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
16-110	Enhanced Gold	End
16-111	Silver	End
16-410	Enhanced Gold	Bottom

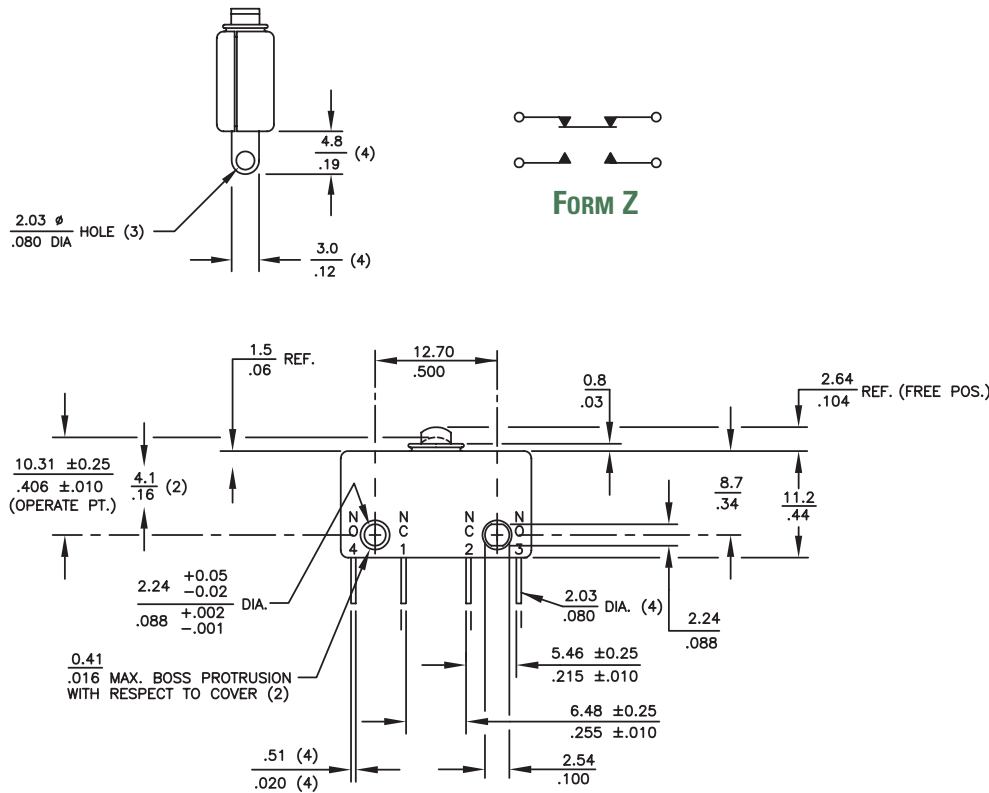
Actuator (see page 69 for additional specifications)

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	—

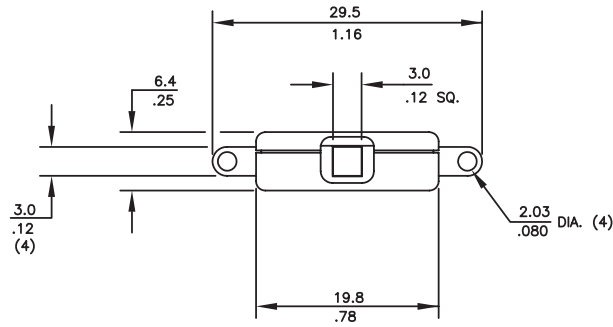
STANDARDS / AGENCY / RATINGS:



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
18-40421	Gold Plated	End Solder	✓
18-488051 (MS27257-1)	Gold Plated	End Solder	✓

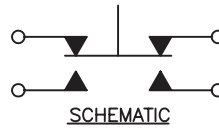
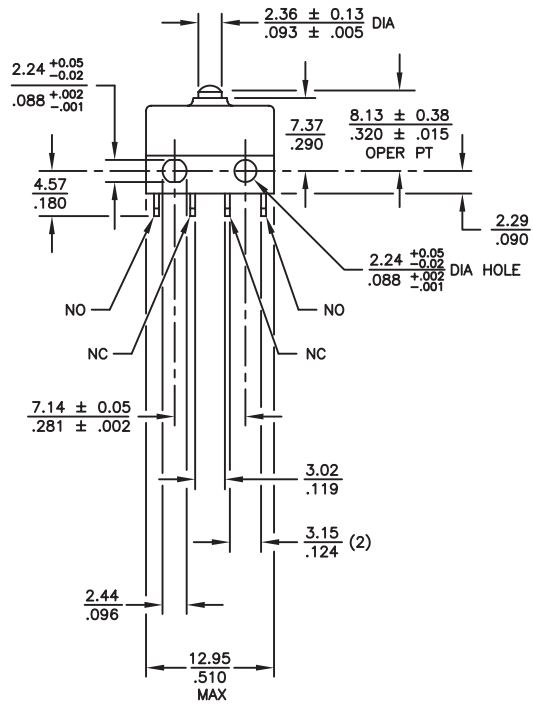
Actuator (see page 70 for additional specifications)

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

STANDARDS / AGENCY / RATINGS:



PRODUCT DRAWINGS



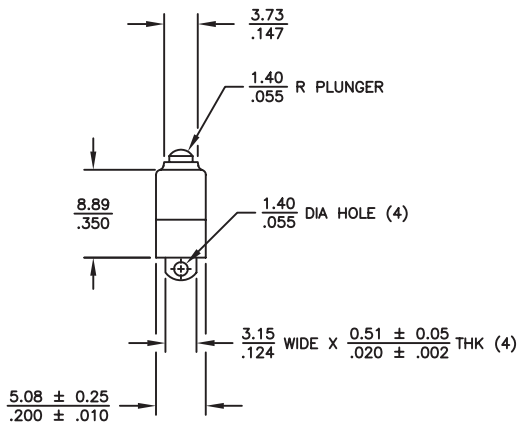
MECHANICAL / ELECTRICAL CHARACTERISTICS:

- 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:

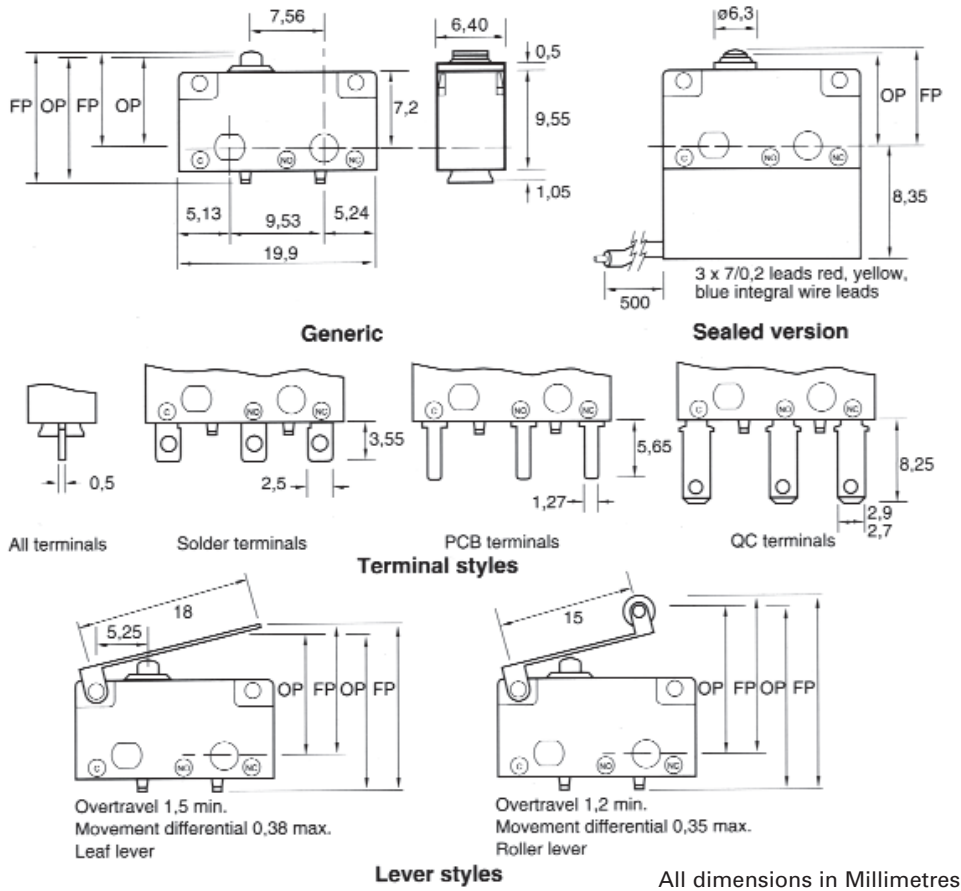
Part Number	Contacts	Actuator Style*	Terminal Style	Sealed	RoHS Compliant	IP67 Compliant
19N402	Silver	Plunger	Solder	Yes	✓	✓
19N402L18	Silver	Leaf lever	Solder	Yes	✓	✓
19N402R15	Silver	Roller lever	Solder	Yes	✓	✓
19N403	Silver	Plunger	Solder	No	✓	—
19N412	Gold	Plunger	Solder	Yes	✓	✓
19N502	Silver	Plunger	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
22-104	End Solder
22-204	#4 Screw
22-304	Side Solder
22-504	Quick Disconnect .250

Actuator (see page 71 for additional specifications)

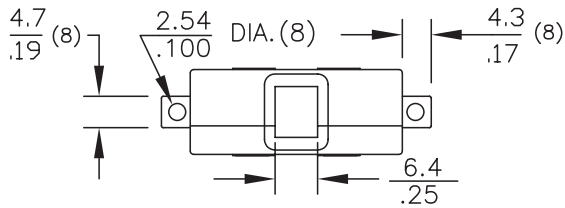
Part Number	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.	Operating Point
72-1160 Roller Lever (1)	10 oz max	1.5 oz min	.150 max	.035 min	.070 ± .015	1.0 ± .031
72-2080 Over Travel (2)	17 ± 5 oz	4 oz min	.060 max	.215 min	.030 ± .007	.828±.031

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

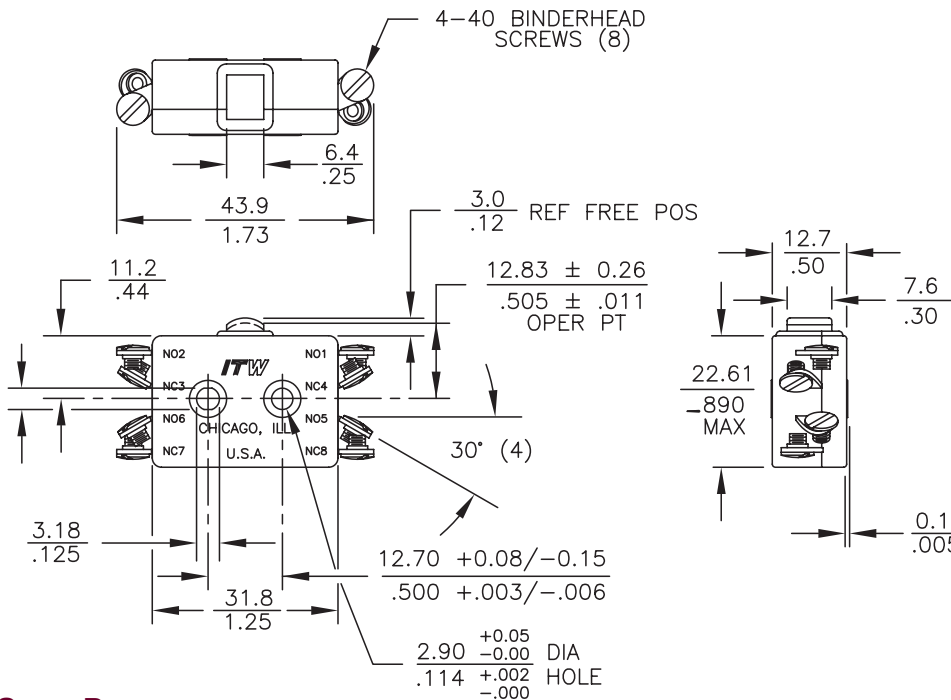
STANDARDS / AGENCY / RATINGS:



END SOLDER



#4 SCREW



MECHANICAL / ELECTRICAL CHARACTERISTICS:

Pretravel:
0.060 inches max

Overtravel:
0.015 inches min

Operating Force:
17 ± 5 oz

Release Force:
4 oz min

Movement Differential:
0.030 inches ± .009

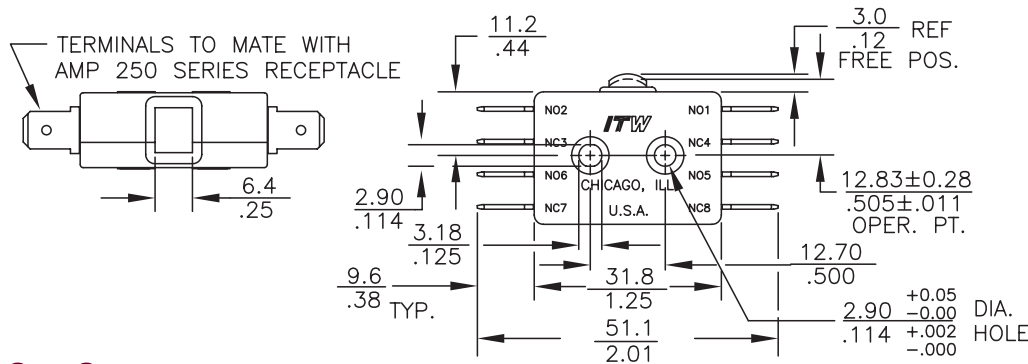
Operating Point:
0.505 inches ± .011
(from mounting hole centers)

Circuit:
DPDT-DB (Form ZZ)

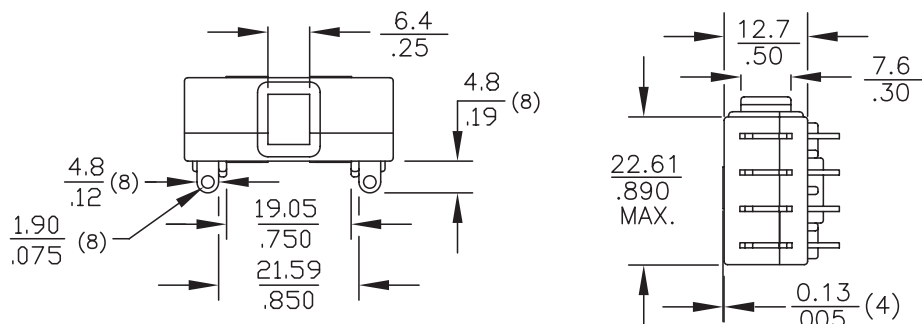
Electrical Ratings:

Circuitry	125/250 VAC	28 VDC
DPST-DB NO or NC (Form XX or YY)	10 amp (75-80% PF) 1/2 HP 125 VAC	10 amp Ind 15 amp Res
DPDT-DB (Form ZZ)	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
26-804	Simultaneous*	Silver**	End Solder	✓
26-888051	Ref. M8805/77-001	Gold Plated	End Solder	—
26-904	Simultaneous*	Silver**	Side Solder	✓
26-988051	Ref. M8805/77-002	Gold Plated	Side Solder	—

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

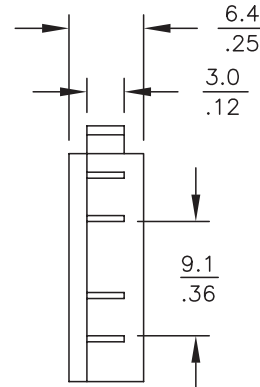
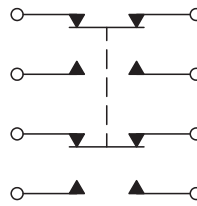
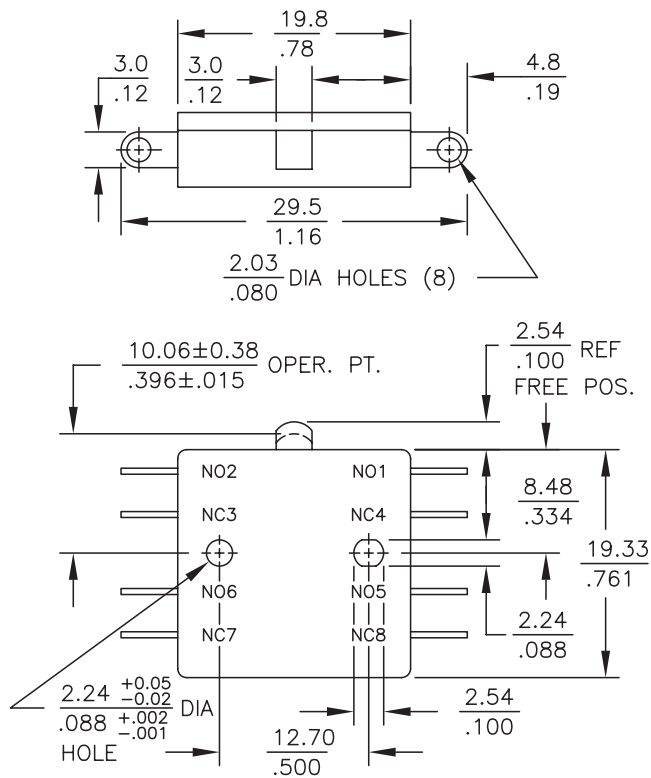
Actuator (see page 72 for additional specifications)

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

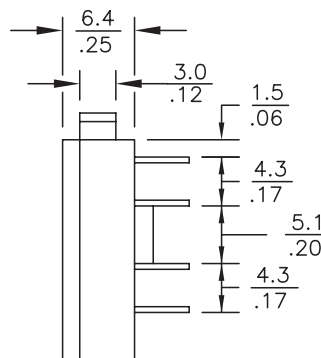
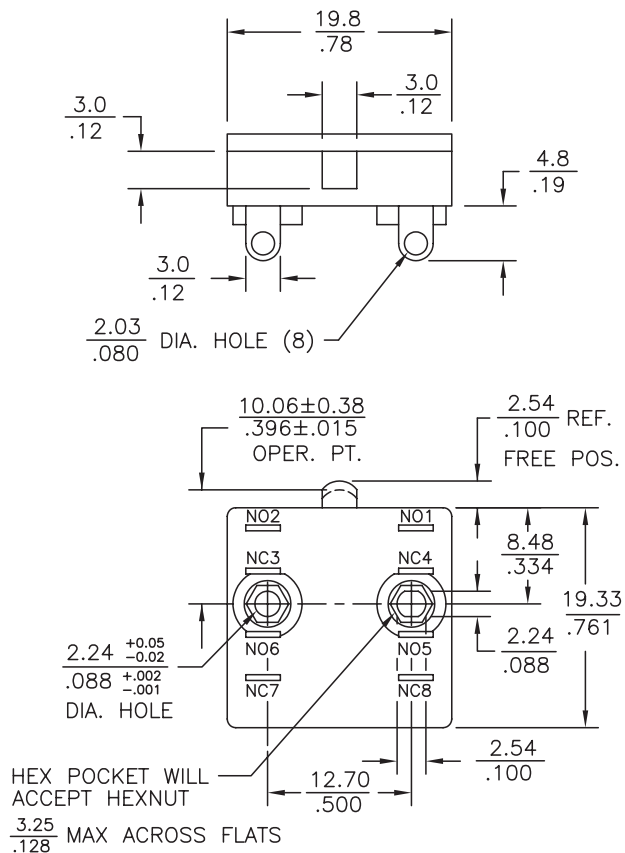
STANDARDS / AGENCY / RATINGS:



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	8 Amps	125/250 VAC 75-80% PF
(Form ZZ)	5 Amps	28 VDC

Series KAP 26

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

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



APPLICATIONS

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

KEY FEATURES:

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

ACTUAL SIZE

ORDERING INFORMATION:

Switches

Part Number	Simultaneity	Contacts	Terminals
26-810	Simultaneous*	Enhanced Gold	End Solder

* Within .002" of plunger travel.

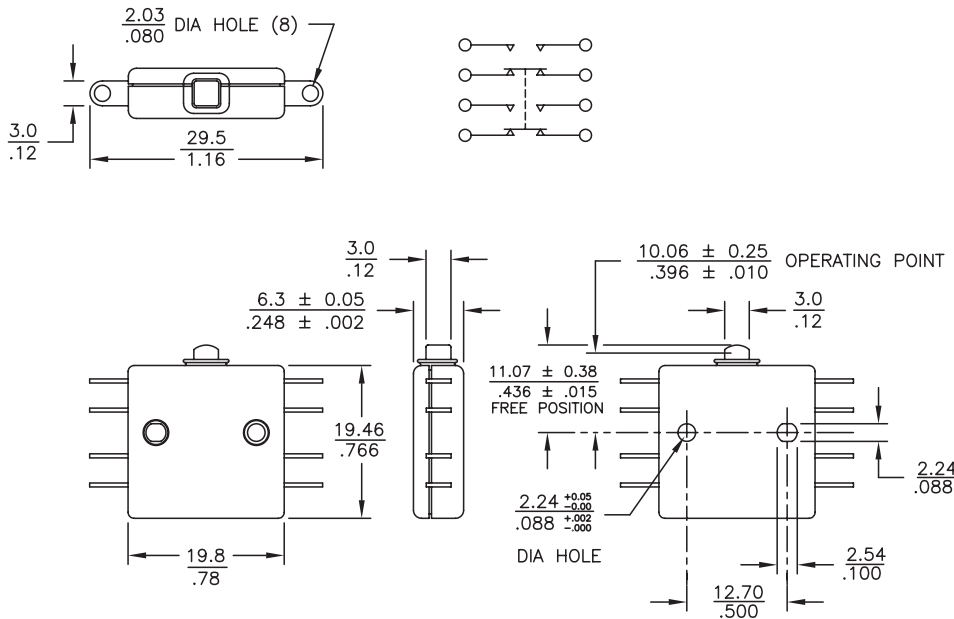
Actuator (see page 72 for additional specifications)

Part Number	Switch Series	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.
76-1200 Roller Lever	26	8 oz max	1 1/2 oz min	.130 max	.026 min	.054 ± .022
76-1210 Lever	26	7 oz max	2 oz min	.155 max	.025 min	.065 max
76-1220 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

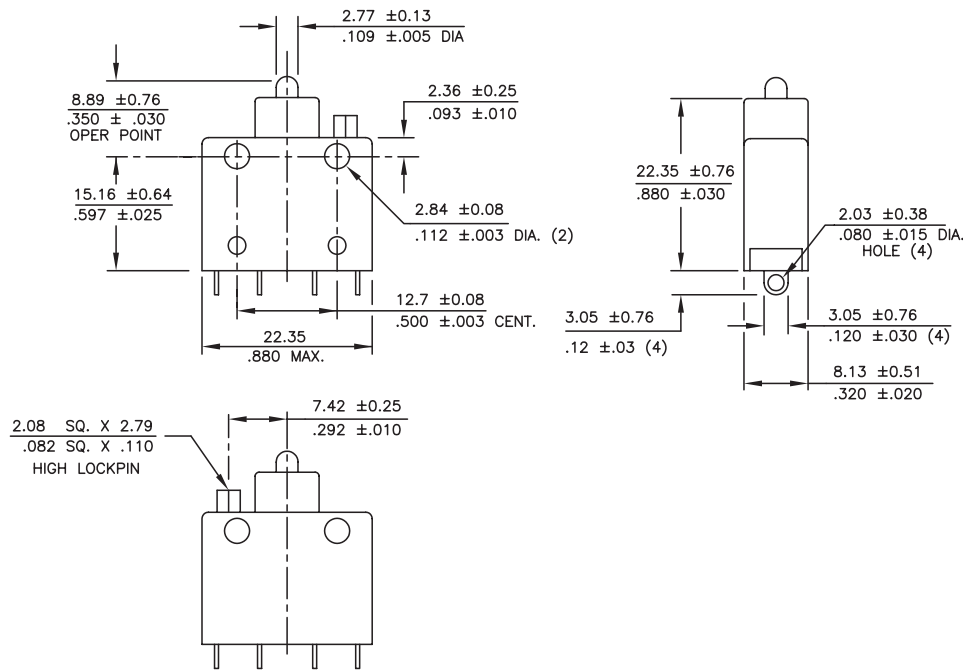
ORDERING INFORMATION:

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)

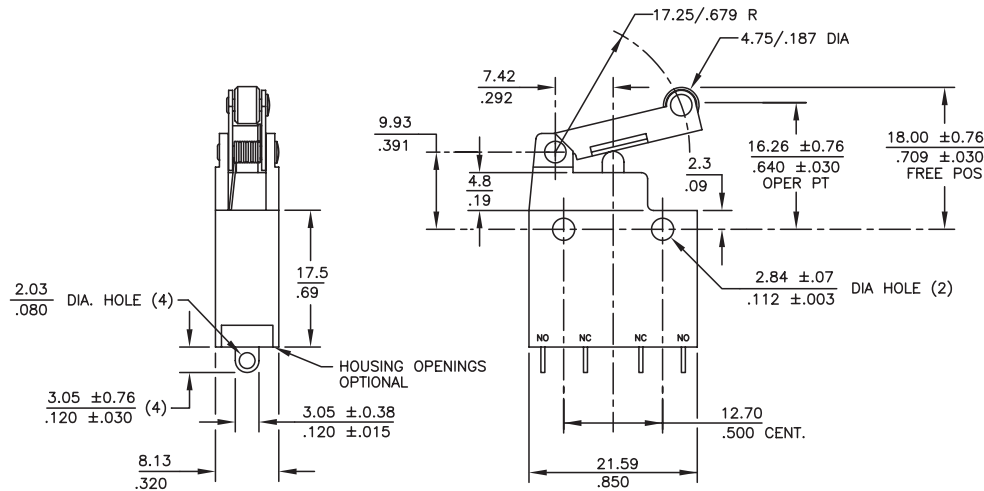
Temperature range:

-55°C to +85°C
(-65°F to +185°F)

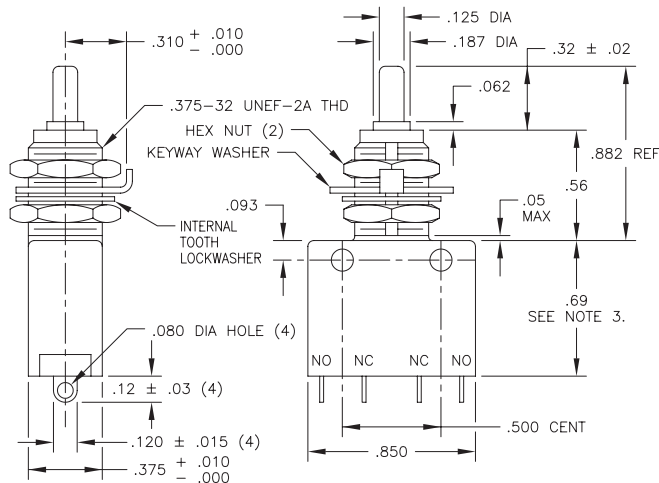
Electrical Ratings (Typical):

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

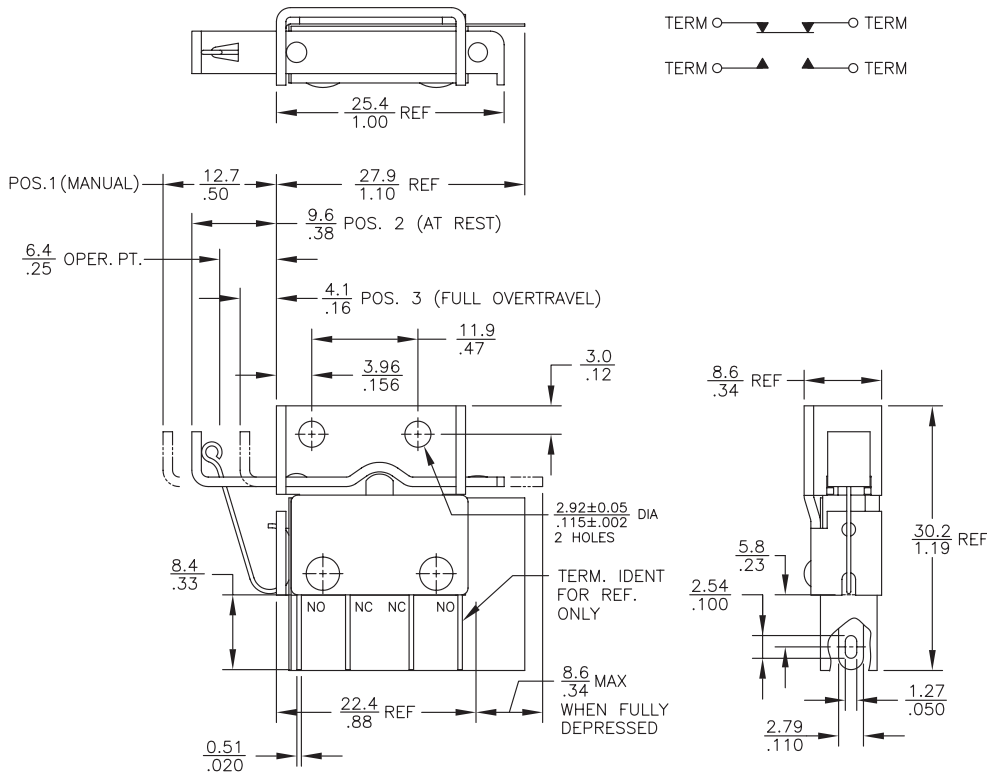
ORDERING INFORMATION:

Part Number	CIRCUIT	125/250 VAC	28 VDC IND	TERMINALS
76-6005	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

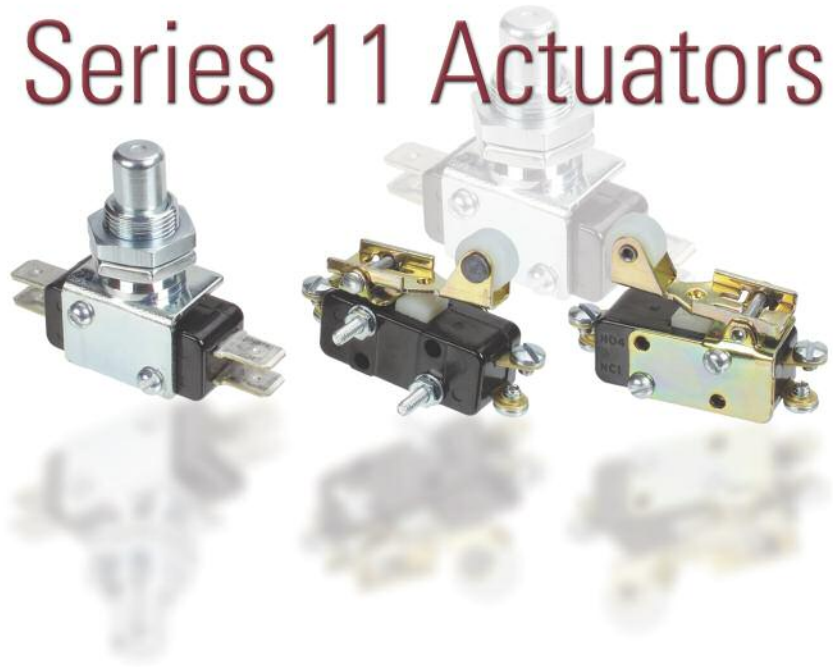
Electrical Ratings:

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:

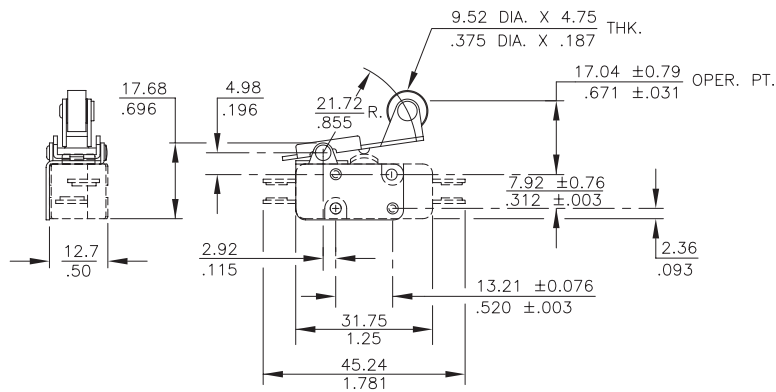
- Roller Lever
- Overtravel

MECHANICAL CHARACTERISTICS*:

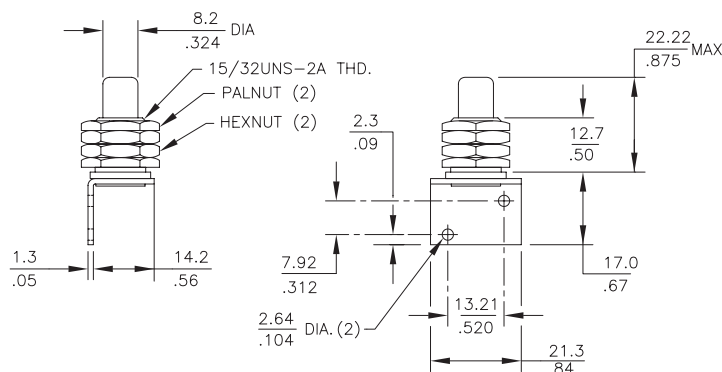
Part Number	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.	Operating Point
71-1040 Roller Lever	3.5 oz max	2 oz min	.093 max	.062 min	.030 ± .015	.671 ± .031
71-2010 Overtravel Plunger	8 ± .3 oz	4 oz min	.050 max	.215 min	.020 ± .005	.828 ± .015

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

71-1040



71-2010



Series 16 Actuators

SEE PAGES 50 & 52
FOR SWITCHES



KEY FEATURES:

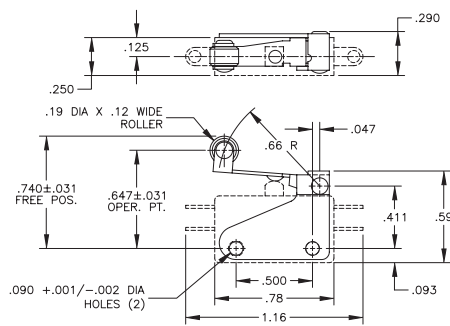
- Roller Lever
- Short Roller Lever
- Lever
- Bushing Mount

MECHANICAL CHARACTERISTICS:

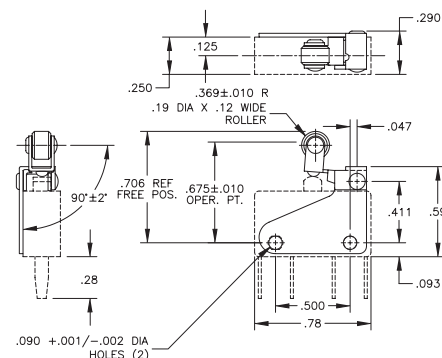
Part Number	Switch Series	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.
76-1200 Roller Lever	16	4 oz max	1 oz min	.125 max	.025 min	.045 ± .011
76-1210 Lever	16	2.5 oz max	1 oz min	.125 max	.025 min	.047 ± .013
76-1220 Short Roller Lever	16	5 + 3 oz - 2 oz min	2 oz min	.050 max	.023 min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

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

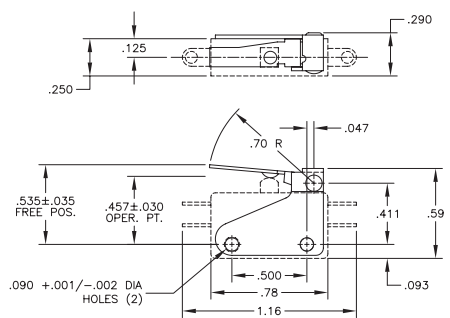
76-1200



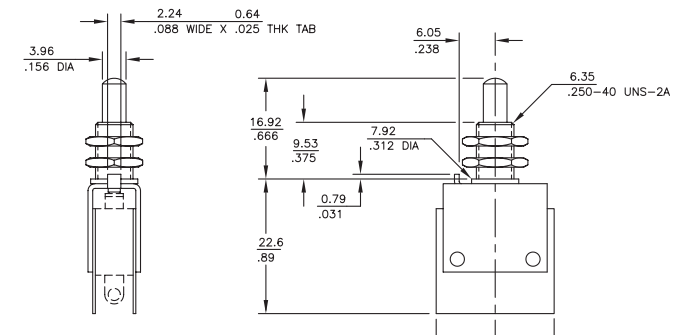
76-1220



76-1210



76-22604



SEE PAGE 54
FOR SWITCHES

Series 18 Actuators



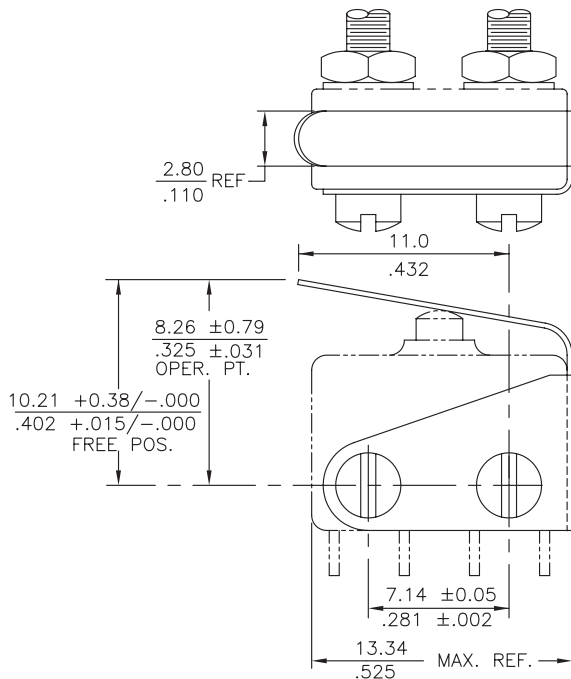
KEY FEATURES:

- Spring Lever
- Roller Lever

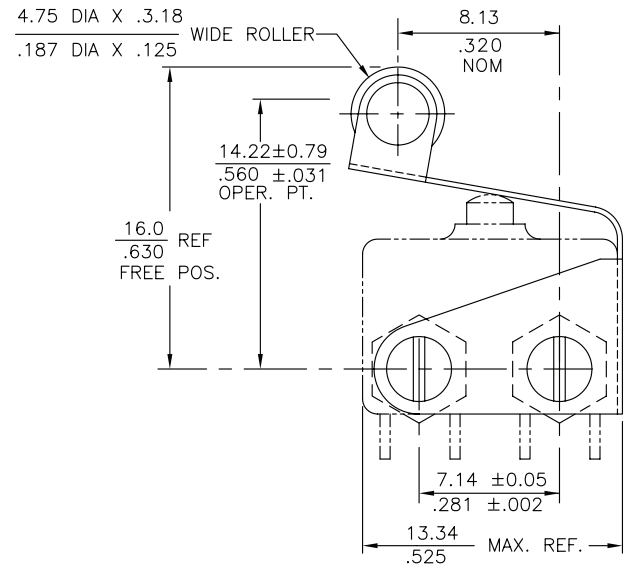
MECHANICAL CHARACTERISTICS:

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

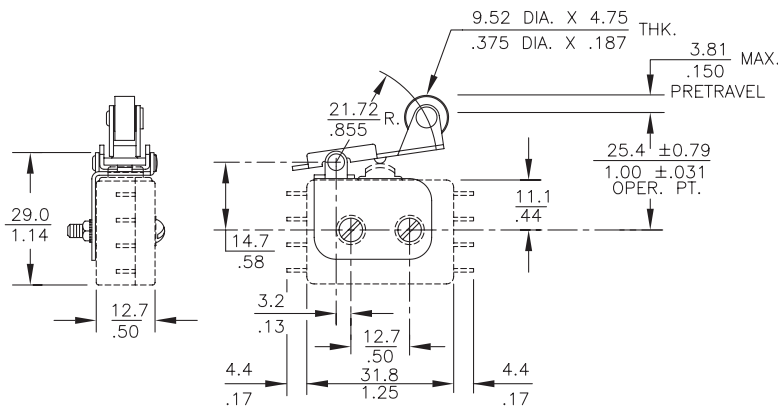
- Roller Lever
- Overtravel

MECHANICAL CHARACTERISTICS:

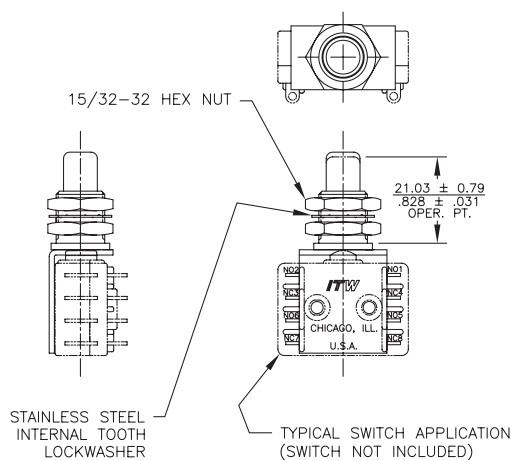
Part Number	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.	Operating Point
72-1160 Roller Lever (1)	10 oz max	1.5 oz min	.150 max	.035 min	.070 ± .015	1.0 ± .031
72-2080 over travel (2)	17 ± 5 oz	4 oz min	.060 max	.215 min	.030 ± .007	.828 ± .031

(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:

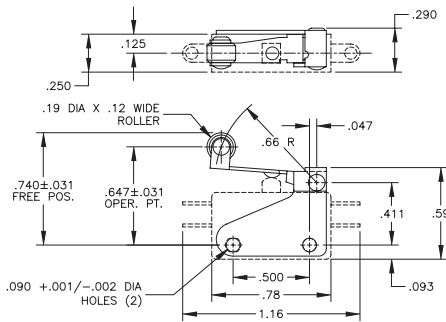
- Roller Lever
- Short Roller Lever
- Lever
- Bushing Mount

MECHANICAL CHARACTERISTICS:

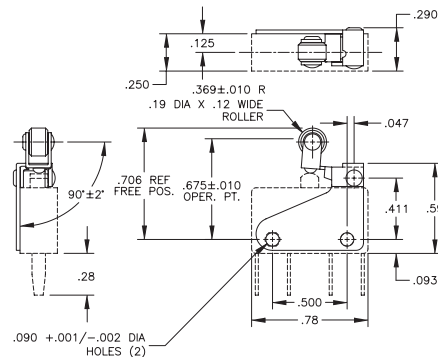
Part Number	Switch Series	Oper. Force	Release Force	Pretravel	Overtravel	Movement Diff.
76-1200 Roller Lever	26	8 oz max	1.5 oz min	.130 max	.026 min	.054 ± .022
76-1210 Lever	26	7 oz max	2 oz min	.155 max	.025 min	.065 max
76-1220 Short Roller Lever	26	16 oz max	5 oz min	.050 max	.012 min	.010 ± .005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

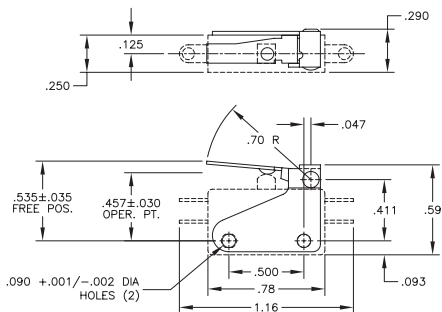
76-1200



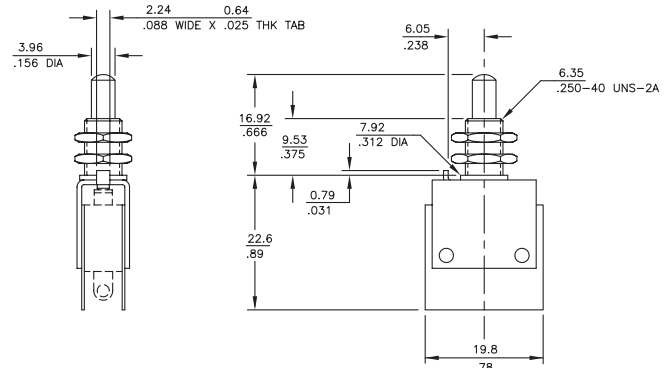
76-1220



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



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SLIDE SWITCHES

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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.



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



ACTUAL SIZE

ORDERING INFORMATION:

Part Number	Circuit	Button Height	Terminal Configuration	Rating
023-021-105	SPDT	0.20	2	250 mA @ 30 VDC
023-021-114	DPDT	0.20	3	100 mA @ 125 VDC
023-021-304 *	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)

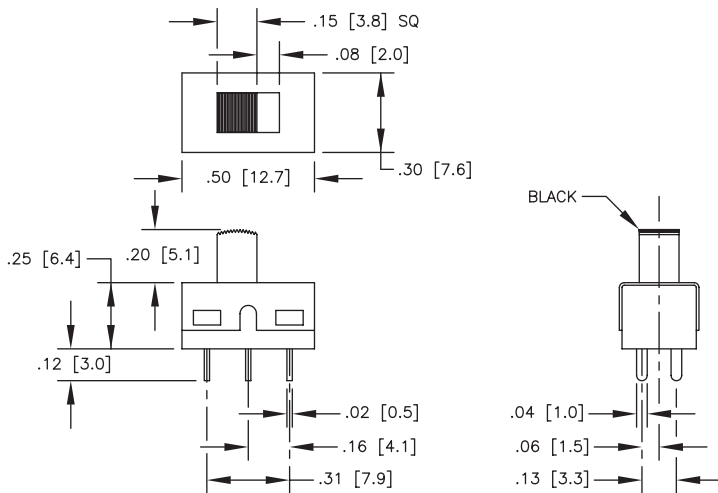
Life:

100,000 actuations

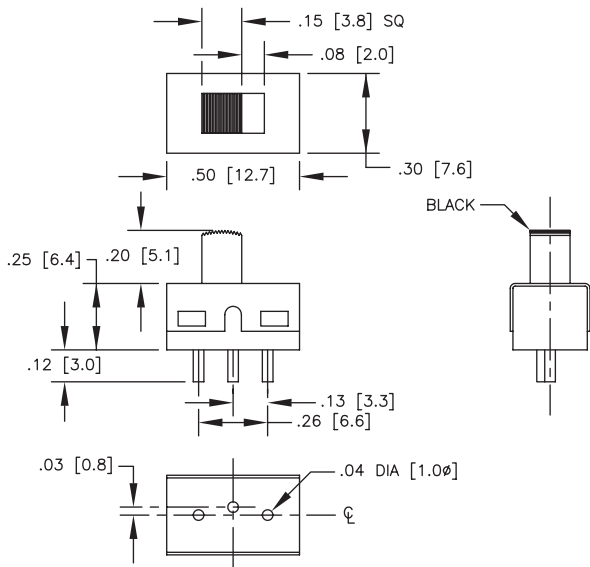
Contact material:

hard gold over barrier

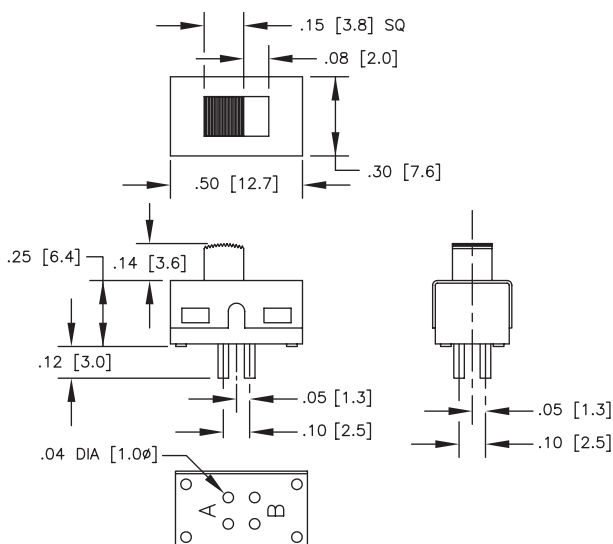
023-021-114



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.

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



ACTUAL SIZE

ORDERING INFORMATION:

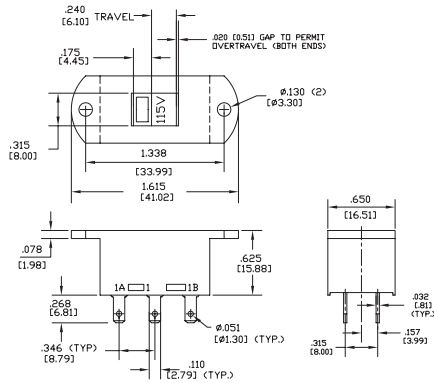
Part Number	Terminals	Dimensions	Marking
18-000-0016	.110 quick connect	1.615 L x .650 W x .625 H	230V/115V
18-000-0019	Right angle	1.030 L x .650 W x .625 H	230V/115V
18-000-0022	PC	1.030 L x .650 W x .625 H	230V/115V
18-000-0040	.110 quick connect	Snap in: .677 x 1.240 Cut out *	230V/115V

* 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.

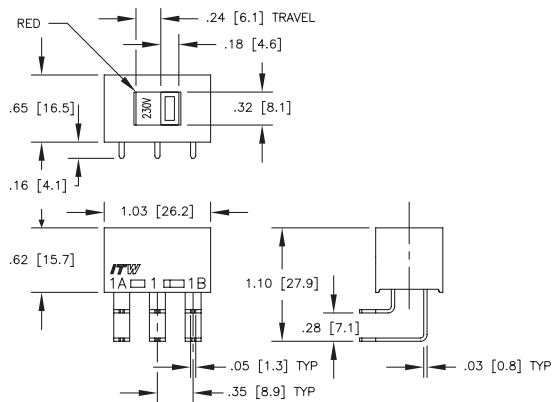
STANDARDS / AGENCY / RATINGS:



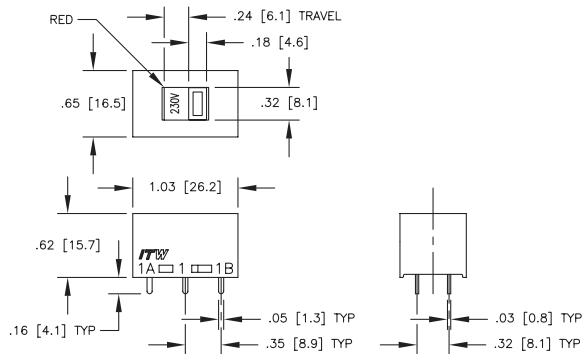
18-000-0016



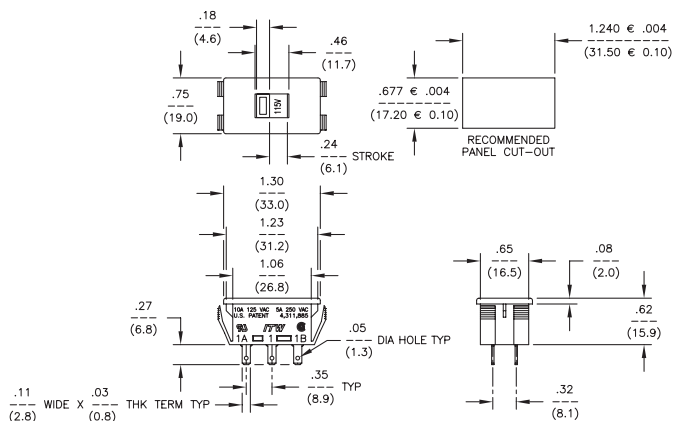
18-000-0019



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 ROTARY SWITCHES

Design, development and manufacture of switch solutions

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



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ROTARY SWITCHES

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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:

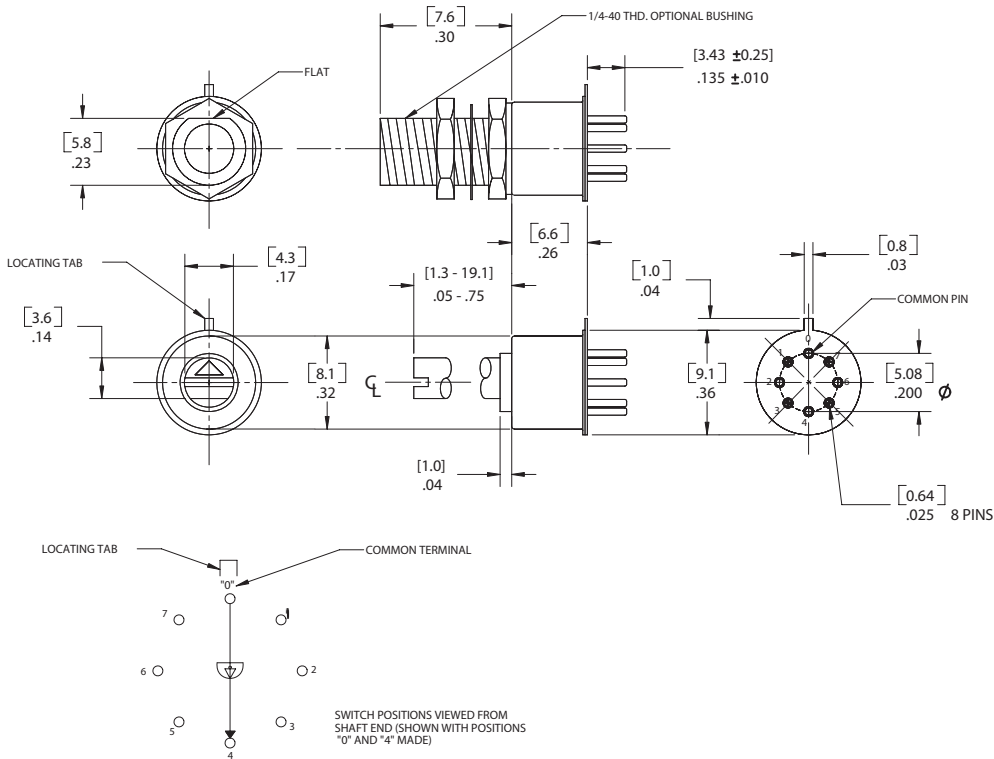
Part Number	Positions	Shaft Length	Custom *
030-202-018	2	0.18	—
030-303-018	3	0.18	—
030-404-018	4	0.18	—
030-404-904	4	0.05	Black Insert, Spacer, No Post
030-404-905	4	0.05	Red Insert, Micro Plastic Spacer
030-505-018	5	0.18	—
030-505-906	5	0.05	Black Insert, Spacer, No Post
030-606-018	6	0.18	—
030-606-902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

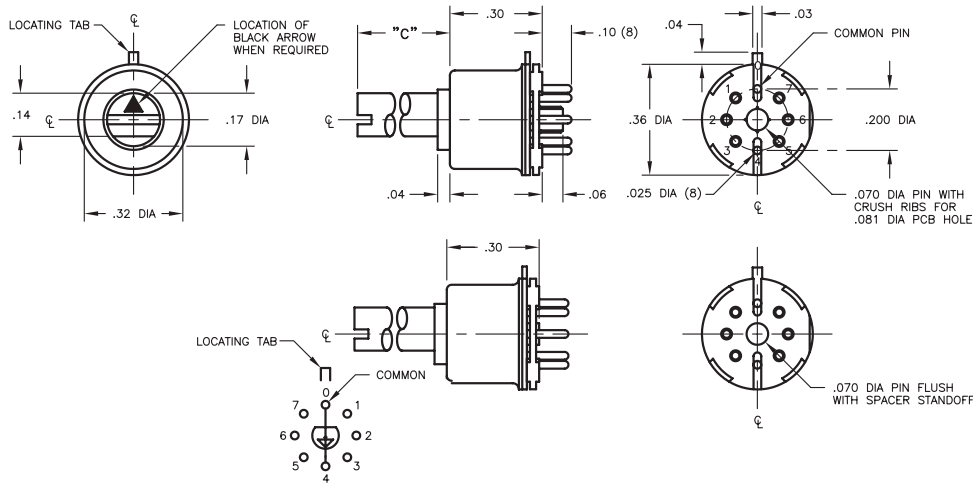
Breakdown voltage:
500 V 60 HZ

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

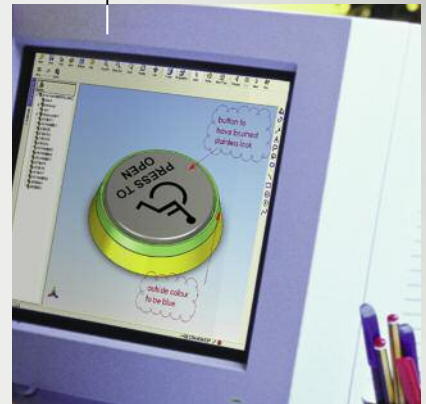
STEP TWO
Utilize proven technology



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.

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

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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
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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
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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		