

N48M- X X X X XX

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
1	SALES DRAWING	8,MAR.,12'	YUANLI

SWITCH FUNCTION CODE	SWITCH FUNCTION DESCRIPTION	HOUSING MATERIAL CODE	HOUSING DESCRIPTION	ILLU. TYPE CODE	ILLUMINATION TYPE DESCRIPTION	LED COLOR CODE	LED COLOR	LED INLET VOLTAGE CODE	LED INLET VOLTAGE
1	MECHANICAL, MOMENTARY, SOLDER TERMINAL	1	STAINLESS STEEL	0	NON-ILLUMINATION	N	NONE	IF BLANK*	(SEE NOTE)
2	MECHANICAL, MAINTAINED, SOLDER TERMINAL	2	ZINC ALLOY, CHROME PLATED	1	CENTER SPOT ILLUMINATION	G	GREEN	05	5V
5	MECHANICAL, MOMENTARY, P.C. TERMINAL			2	RING ILLUMINATION	R	RED	IF BLANK*	(SEE NOTE)
6	MECHANICAL, MAINTAINED, P.C. TERMINAL			3	POWER/STANDBY SYMBOL ILLUMINATION	A	AMBER	05	5V
A	MACHANICAL, MOMENTARY, WIRELEADS			B	BLUE	12	12V		
B	MACHANICAL, MAINATINED, WIRELEADS			W	WHITE	24	24V		
				Y	YELLOW				
						RB	RED/BLUE		
						RG	RED/GREEN		

MECHANICAL CHARACTERISTICS:
 SWITCH CIRCUITRY: SPST-NO-DB (CONTACT FORM X)
 SWITCH ACTION: MOMENTARY AND MAINTAINED (PER CHART)
 BUTTON TRAVEL: .090 [2.3mm] NOMINAL
 OPERATING FORCE: 3N [306g] NOMINAL
 CONTACT BOUNCE: 1ms NOMINAL
 PANEL THICKNESS: .020 - .177 [0.5 - 4.5mm]
 CONTACTS: GOLD PLATED
 NUT TORQUE FORCE: MAX 10 LB/in [11.5 kgf/cm]

ENVIROMENTAL SPECIFICATIONS:
 ACTUATOR INGRESS PROTECTION: IP65

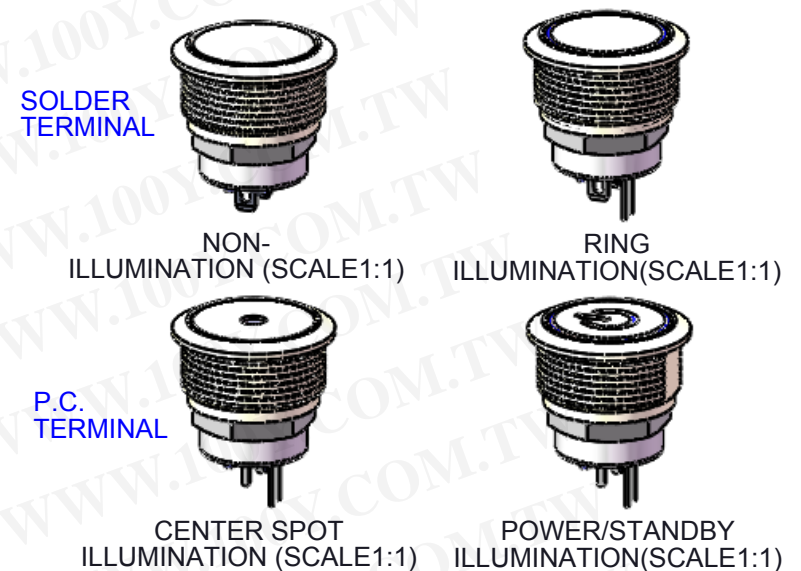
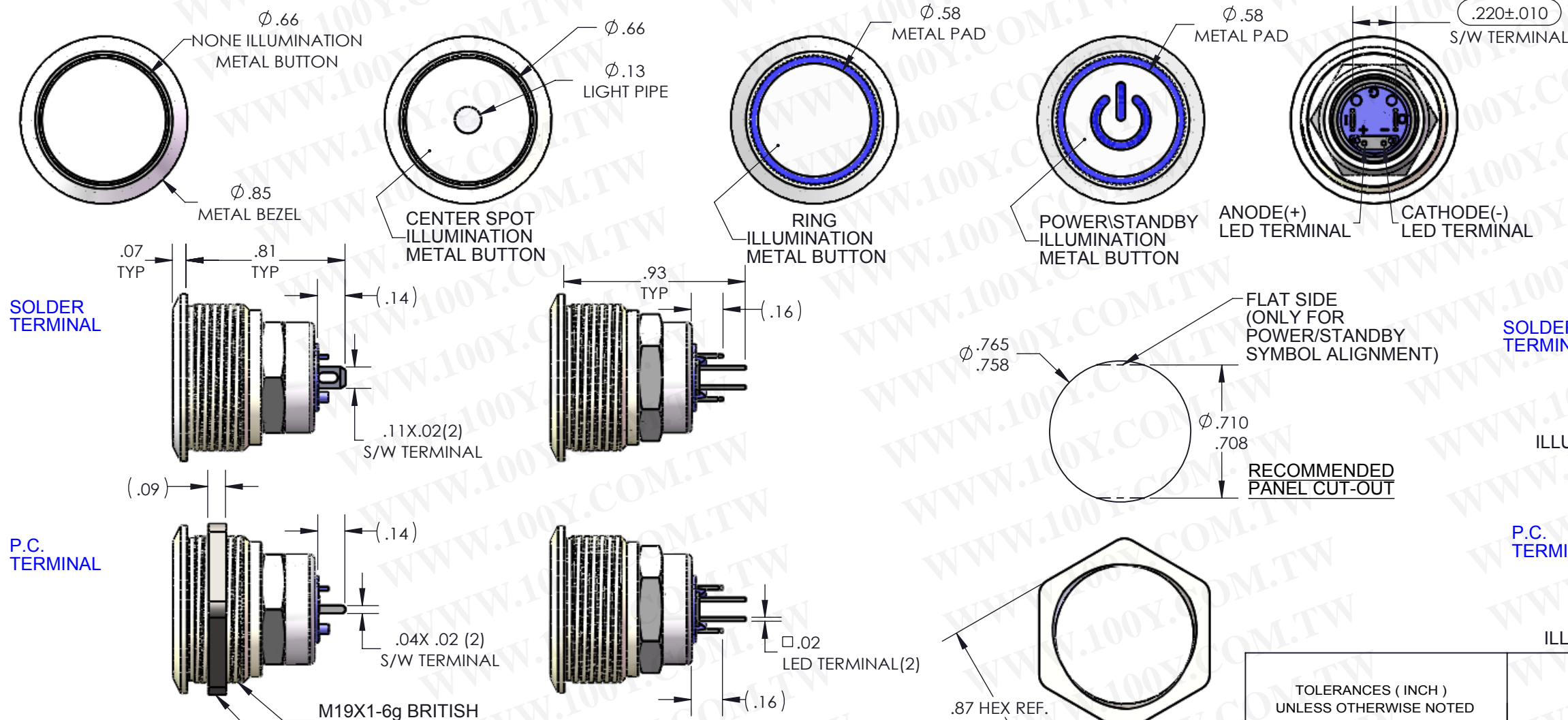
OPERATING TEMPERATURE:
 NON-ILLUMINATION TYPE: -40°F to +185°F [-40°C to +85°C]
 ILLUMINATION TYPE: -13°F to +185°F [-25°C to +85°C]

ELECTRICAL SPECIFICATIONS:
 CURRENT RATING:
 MOMENTARY: 10mA@12VDC, 200K CYCLES
 MAINTAINED: 20K CYCLES NOMINAL

DIELECTRIC STRENGTH: 1,000VAC
INSULATION RESISTANCE: 1G OHM
CONTACT RESISTANCE:
 50M/250m OHMS MAX INITIAL (NON-WIRELEADS/WIRELEADS)

LED SPECIFICATIONS:
 SEE LED SPECIFICATION (PAGE 2)

NOTE
 1. CURRENT LIMITING RESISTOR IS REQUIRED TO LIMIT LED FORWARD CURRENT TO 20mA
 2. SUPPLY HEX NUT BULK PACKED



勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

RoHS Compliant Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		TOLERANCES (INCH) UNLESS OTHERWISE NOTED 3 PLACE DECIMAL ± .015 2 PLACE DECIMAL ± .02 ANGULAR ± 1/2°		ITW Switches AN ILLINOIS TOOL WORKS COMPANY	
		DWG TITLE N48M-MECHANICAL MOMENTARY/MAINTAINED, SOLD./P.C. TERMINAL, WIRELEADS, NONE/CENTER SPOT/RING/POWER-STANDBY ILLUMINATION			
DATE	REF:	SIZE	DWG NO.	REV	
03 SEP., 10'	S48M-1, 2, 5, 6, A, B	B	N48M-1, 2, 5, 6, A, B	1	
DRAWN	CHK	APP'D	SUPV	SCALE: 1.5:1 SHEET 1 OF 2	
Y.W.	J.W.	B.C.	P.L.		

ORDERING INFORMATION:

Series:

- Blank** Gold Contact IP67
- S** Silver Contact IP67
- N** Silver Contact
- G** Silver Contact IP67/2A

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, Natural
- 2** Zinc Alloy, Velour Chrome Plated

Illumination:

- 0** Nin-lit
- 1** Center Spot Illumination
- 2** Ring Illumination
- 3** Standby Logo Illumination

LED Color:

- N** None
- G** Green
- R** Red
- A** Amber
- Y** Yellow
- B** Blue
- W** White
- RB** Red / Blue
- RG** Red / Green

Voltage Resistor:

- If Blank*
- 05** 5V Forward
- 12** 12V Forward
- 24** 24V Forward

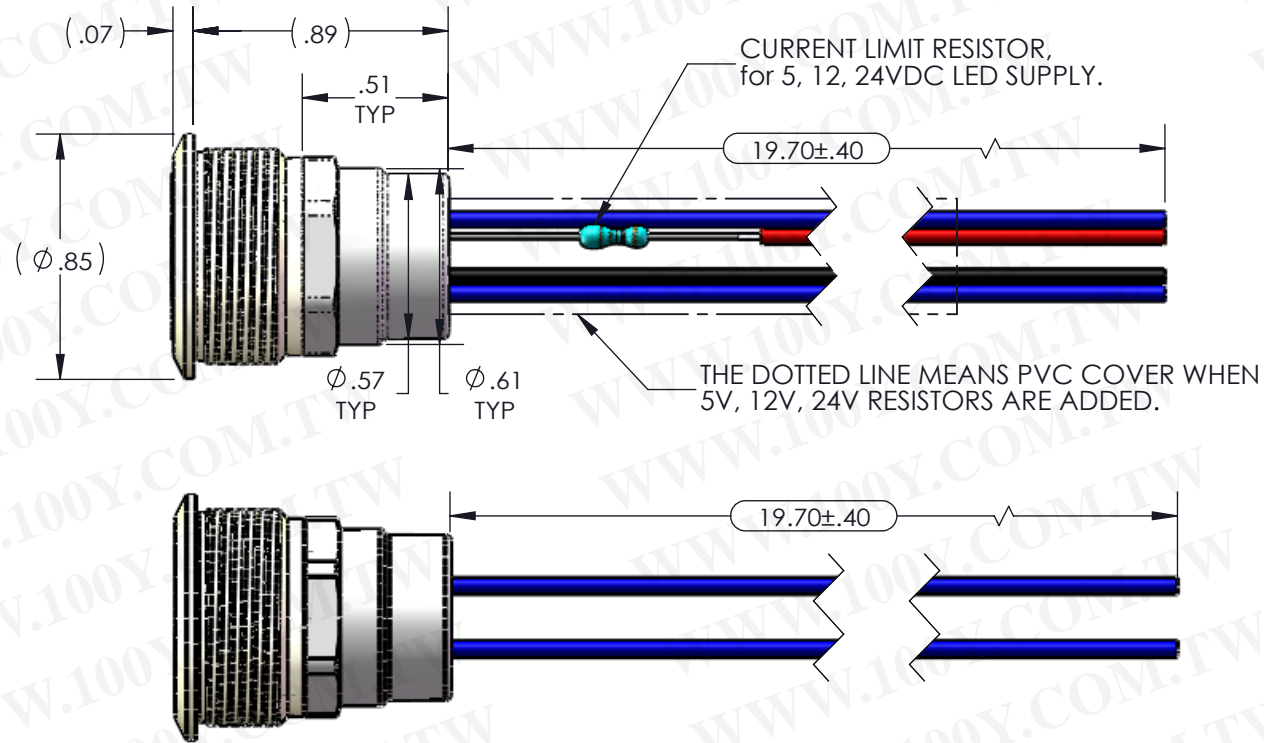
48M- - - - - -

- * Current limiting resistor is required to limit LED forward current to 20mA (not included).
- ** Resistor included, jacketed leads by special request.
- *** Resistor and jacketed leads included.

WIRELEADS

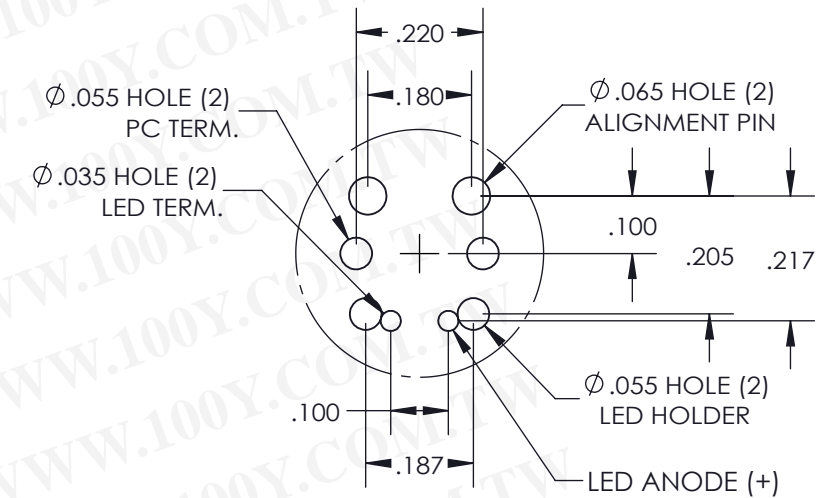
ILLUMINATION

NON-ILLUMINATION



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REV	DESCRIPTION	DATE	APPROVED
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RECOMMENDED P.C. BOARD HOLE PATTERN
 (FOR PC TERMINAL)
 COMPONENT SIDE
 SCALE 2 : 1

LED SPECIFICATION						
LED CODE	LED		CIRCUITRY	Vf(VDC)		If (mA)
	Color 1	Color 2		Color 1	Color 2	
A	AMBER	-		1.6 ~ 2.0	-	20
R	RED	-		1.6 ~ 2.0	-	20
Y	YELLOW	-		1.6 ~ 2.0	-	20
B	BLUE	-		2.8 ~ 3.4	-	20
G	GREEN	-		2.8 ~ 3.4	-	20
W	WHITE	-		2.8 ~ 3.4	-	20
RB	RED	BLUE		1.6 ~ 2.0	2.8 ~ 3.4	20
RG	RED	GREEN		1.6 ~ 2.0	2.8 ~ 3.4	20

Notes:
 1.) Lead Soldering Temperature (4mm from Body) : 280°C for 5 seconds
 2.) Hand Soldering Temperature (4mm from Body) : 320°C for 3 seconds








TABLE- WIRELEADS DESCRIPTION

SWITCH TYPE	WIRELEADS SPECIFICATION	SW TERMINALS		LED				N48M SW P/N
		I	O	COLOR 1	COLOR 2	+	-	
ILLUMINATION	AWG26/UL1007	BLUE	BLUE	RED	BLACK	BLACK	RED	N48M-XX1XXX N48M-XX2XXX N48M-XX3XXX
NON-ILLUMINATION		BLUE	BLUE	---	---	---	---	N48M-XX0N

RoHS Compliant Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		TOLERANCES (INCH) UNLESS OTHERWISE NOTED 3 PLACE DECIMAL ± .015 2 PLACE DECIMAL ± .02 ANGULAR ± 1/2°		 AN ILLINOIS TOOL WORKS COMPANY			
DATE: 03 SEP., 10' DRAWN: Y.W. CHK: J.W. APP'D: B.C. SUPV: P.L.		REF: N48M-1, 2, 5, 6, A, B		DWG TITLE: N48M-MECHANICAL MOMENTARY/MAINTAINED, SOLD./P.C. TERMINAL, WIRELEADS, NONE/CENTER SPOT/RING/POWER-STANDBY ILLUMINATION			
		DATE: 03 SEP., 10' DRAWN: Y.W. CHK: J.W. APP'D: B.C. SUPV: P.L.	REF: N48M-1, 2, 5, 6, A, B	SIZE B SCALE: 1.5:1	DWG NO. N48M-1, 2, 5, 6, A, B SHEET 2 OF 2	REV 1	

ITW SWITCHES SEALED IP67 PUSHBUTTONS

Design, development and manufacture of switch solutions

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



ITW Switches
SENSORS, SWITCHES, ELECTRONIC CONTROLS



WWW.ITWSWITCHES.COM

800.544.335

SEALED IP67 PUSHBUTTON SWITCHES

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

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

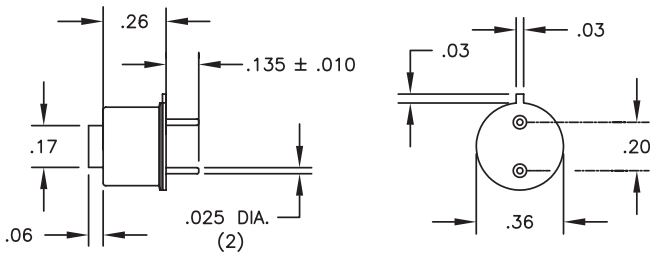
ORDERING INFORMATION:

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

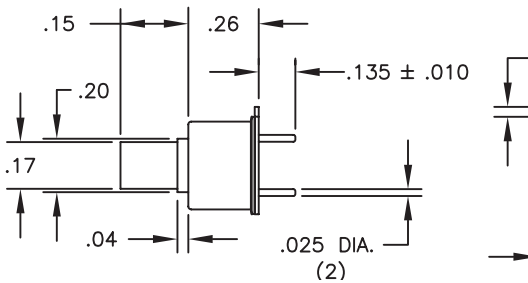
STANDARDS / AGENCY / RATINGS:



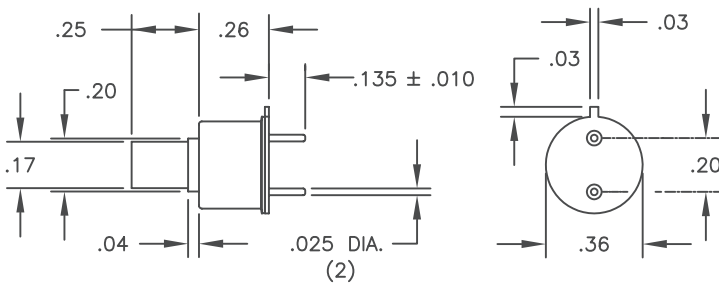
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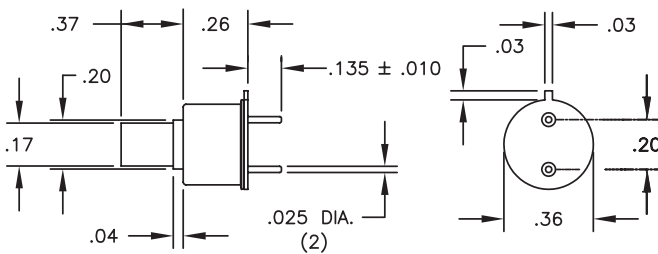
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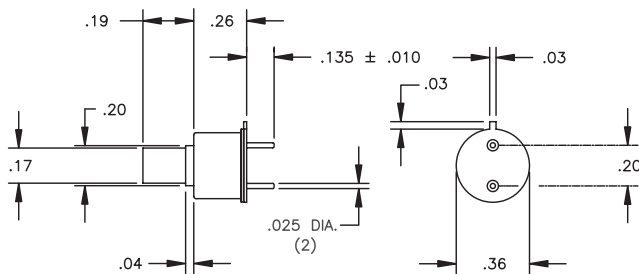
034-550-006



034-550-010



034-550-015



MECHANICAL / ELECTRICAL CHARACTERISTICS:

Circuit:

SPST-NO (Form A) Momentary

Temperature rating:

-30°C to +65°C
(-22°F to +149°F)

Life (mechanical):

1,000,000 actuations

Contact rating:

100 mA @ 125 VAC

Actuator:

thermoplastic (PBTP)

Can:

Nickel-silver

Contacts & terminals:

gold over nickel plate

Series 39

0.25 AMP MINIATURE LED LIGHTED

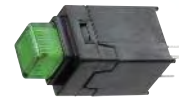
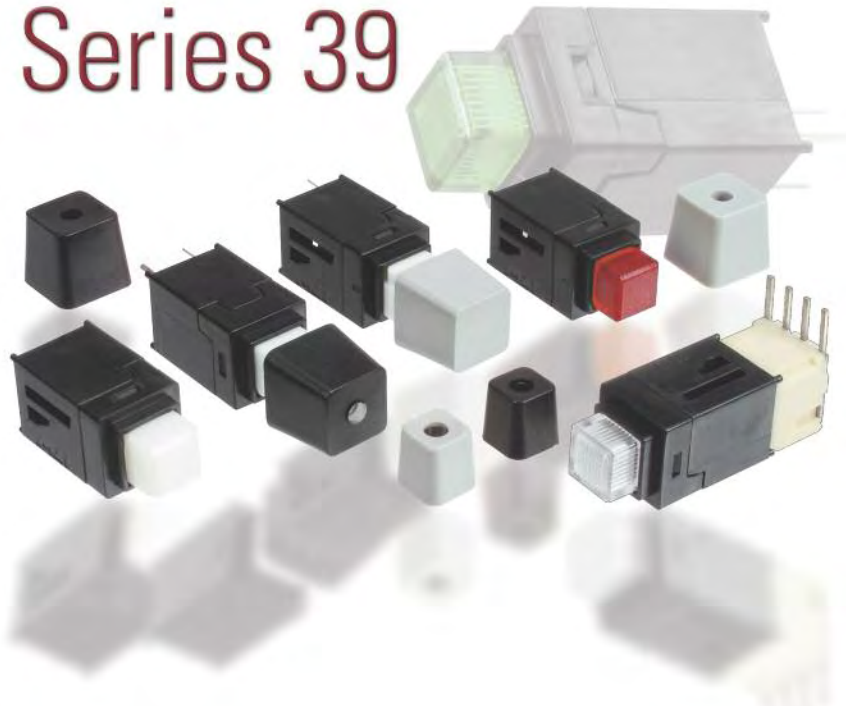
This highly reliable low cost pushbutton features bifurcated contacts that have wiping, self-cleaning action. The PC terminals allow for vertical mounting, while an optional connector allows for right angle mounting.

APPLICATIONS

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

KEY FEATURES:

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



ACTUAL SIZE

ORDERING INFORMATION:

Switches

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

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

Button/Keycap Colors

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

* Requires light pipe 80-390100 (order separately)

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

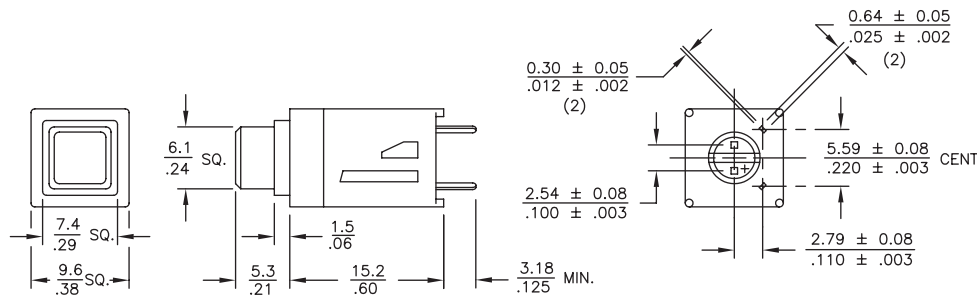
Connectors

Part Number	Mount
39-800001	In-Line

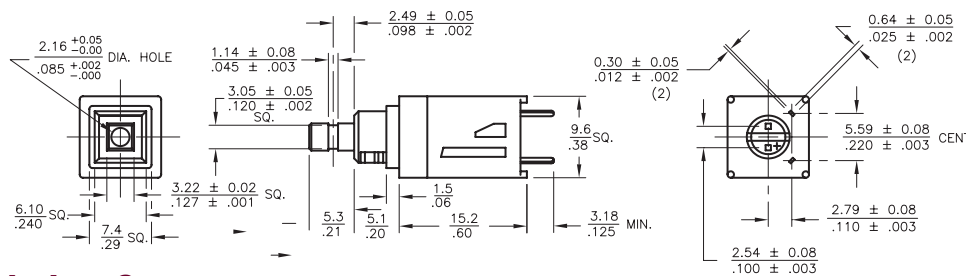
STANDARDS / AGENCY / RATINGS:



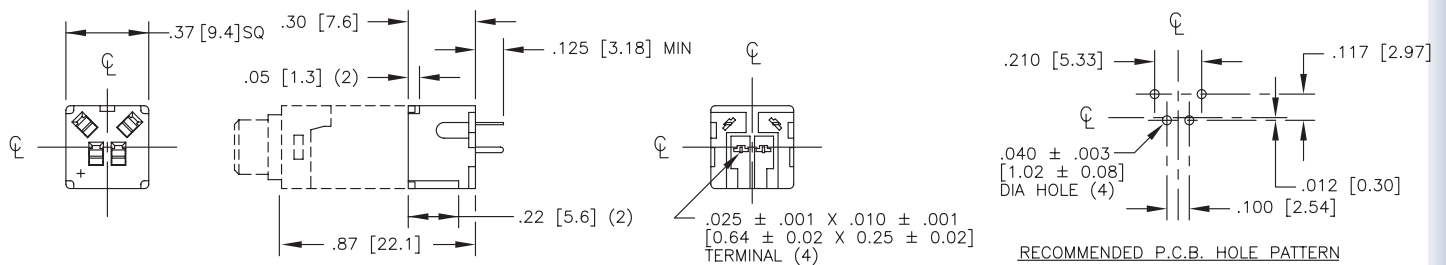
STANDARD BUTTON STYLE



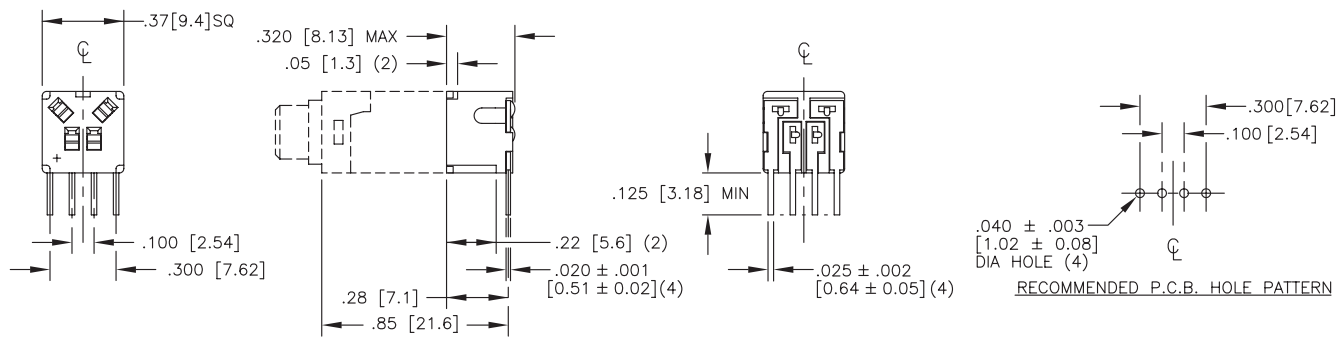
KEYCAP BUTTON STYLE



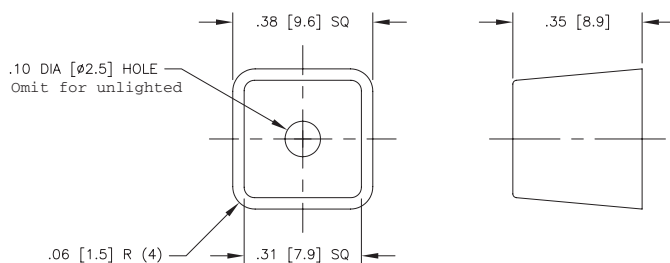
IN-LINE CONNECTOR



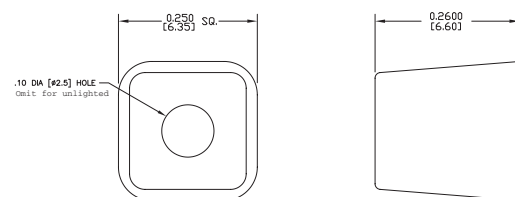
RIGHT ANGLE CONNECTOR



LARGE LIGHTED & UNLIGHTED KEYCAP



SMALL LIGHTED & UNLIGHTED KEYCAP



MECHANICAL / ELECTRICAL CHARACTERISTICS:

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

Series 39-4

0.25 AMP RIGHT-ANGLE DPST LIGHTED

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



ACTUAL SIZE

APPLICATIONS

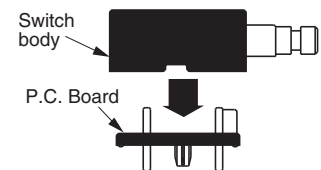
- Control panel assemblies
- Recording equipment
- Telecom switching systems
- Scientific instrumentation
- Telecom test gear

KEY FEATURES:

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

INSTALLATION:

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



ORDERING INFORMATION:

Button Style

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

*Lighted styles have button and LED installed as required.

Keycap Style

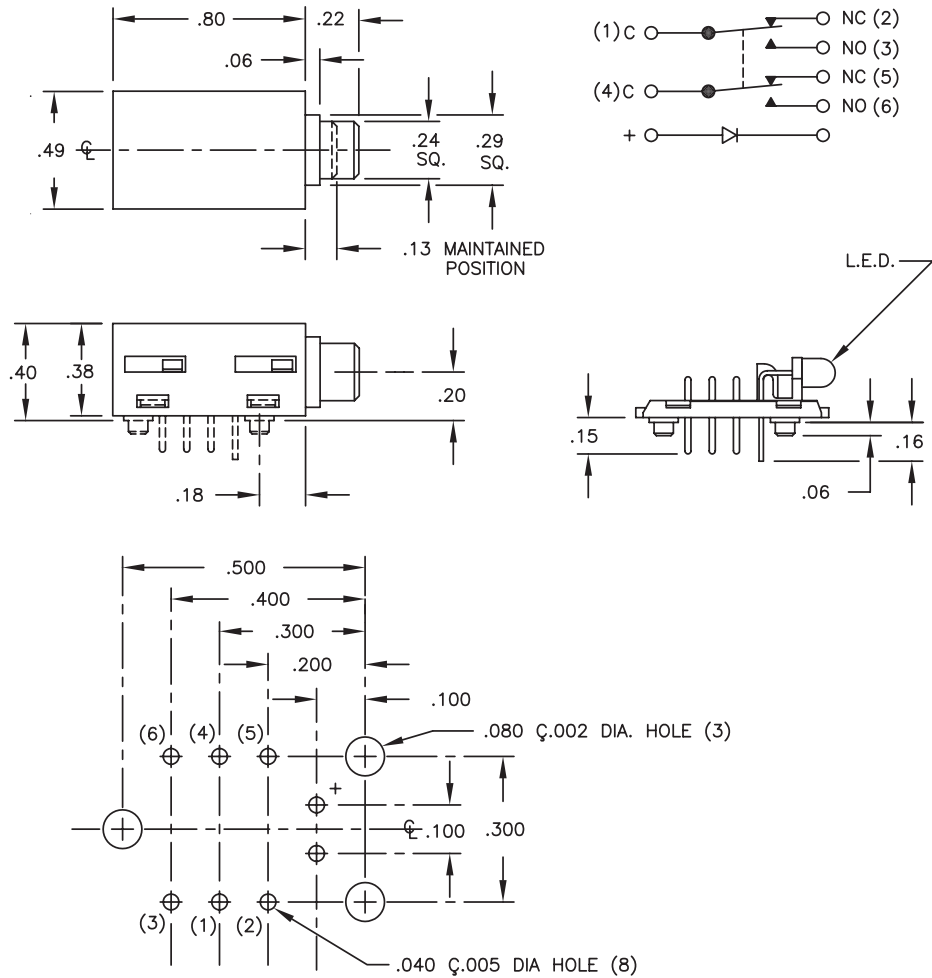
Part Number	LED Color *	Action
39-522101	—	Momentary
39-522701	Yellow	Momentary
39-523101	—	Maintained
39-523501	Red	Maintained

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

STANDARDS / AGENCY / RATINGS:



BUTTON STYLE

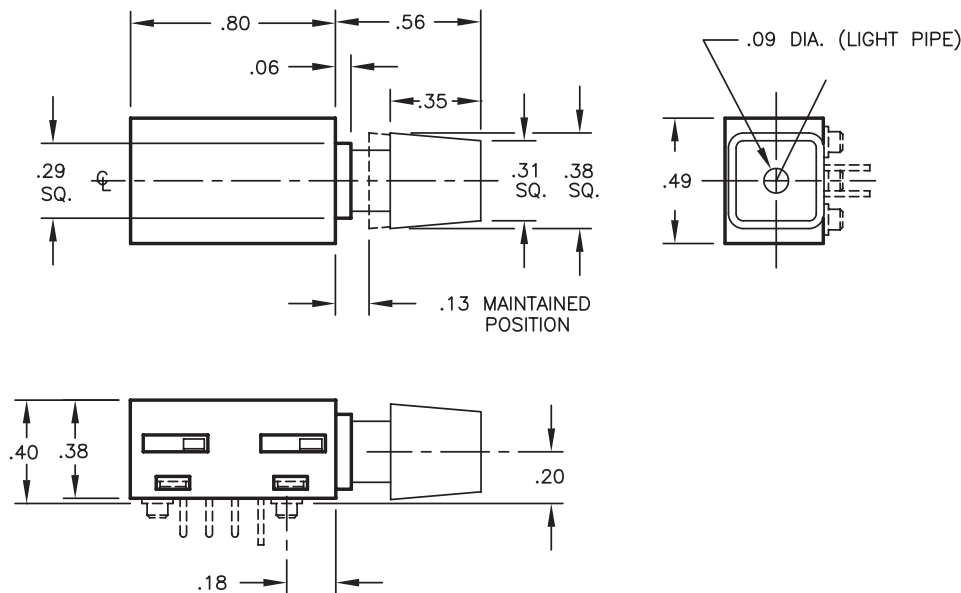


MECHANICAL / ELECTRICAL CHARACTERISTICS:

- 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

RECOMMENDED P.C. BOARD HOLE PATTERN
COMPONENT SIDE

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



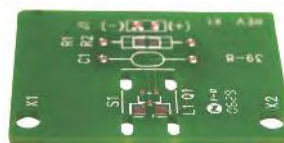
ACTUAL SIZE

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



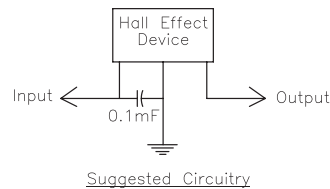
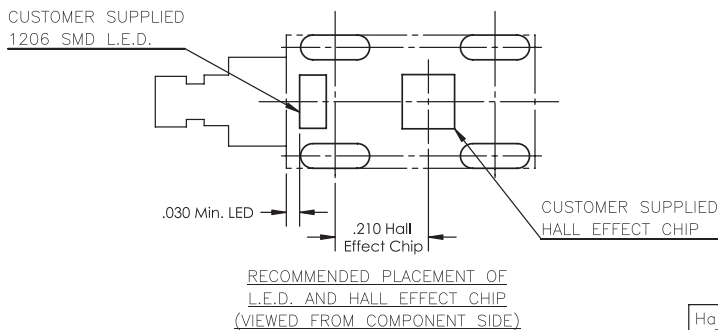
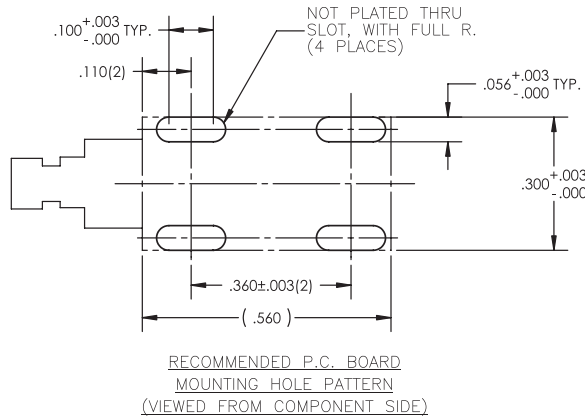
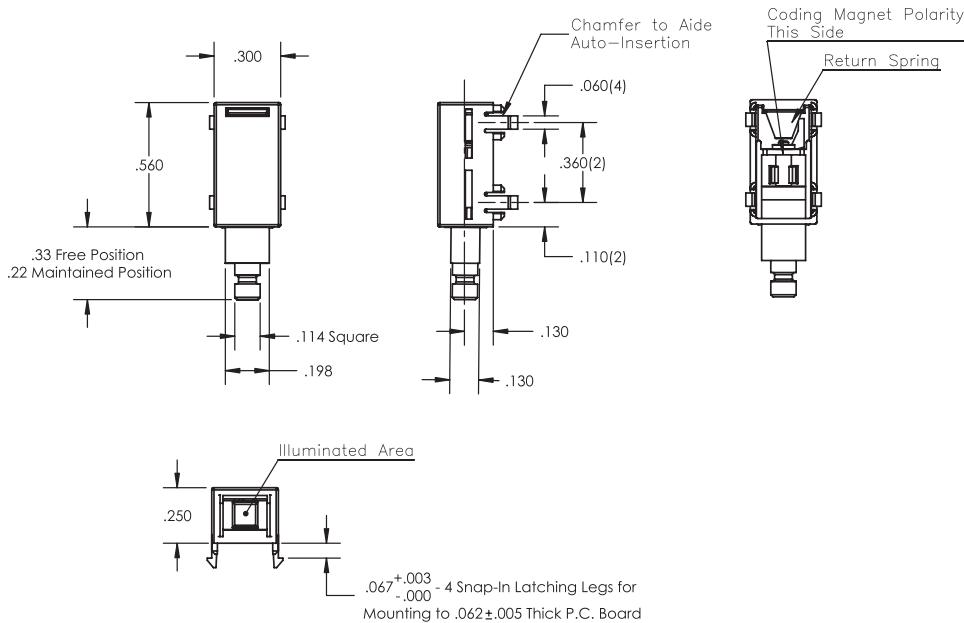
④—Complete Assembly



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

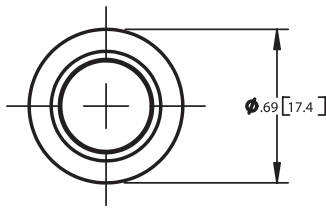
ORDERING INFORMATION:

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	✓	

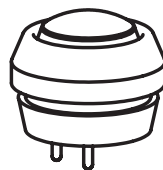
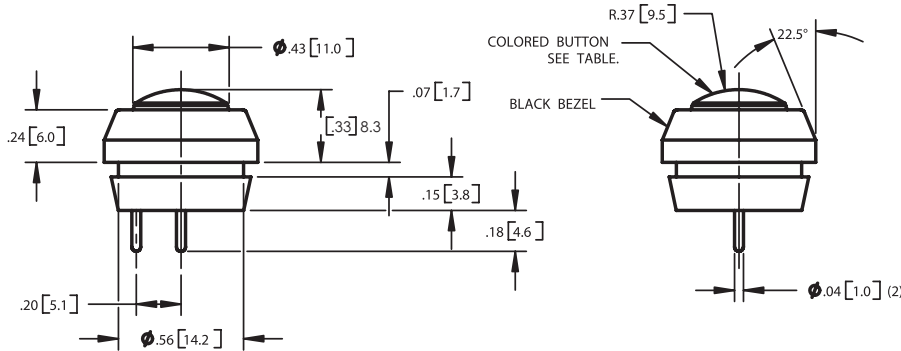
STANDARDS / AGENCY / RATINGS:



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		

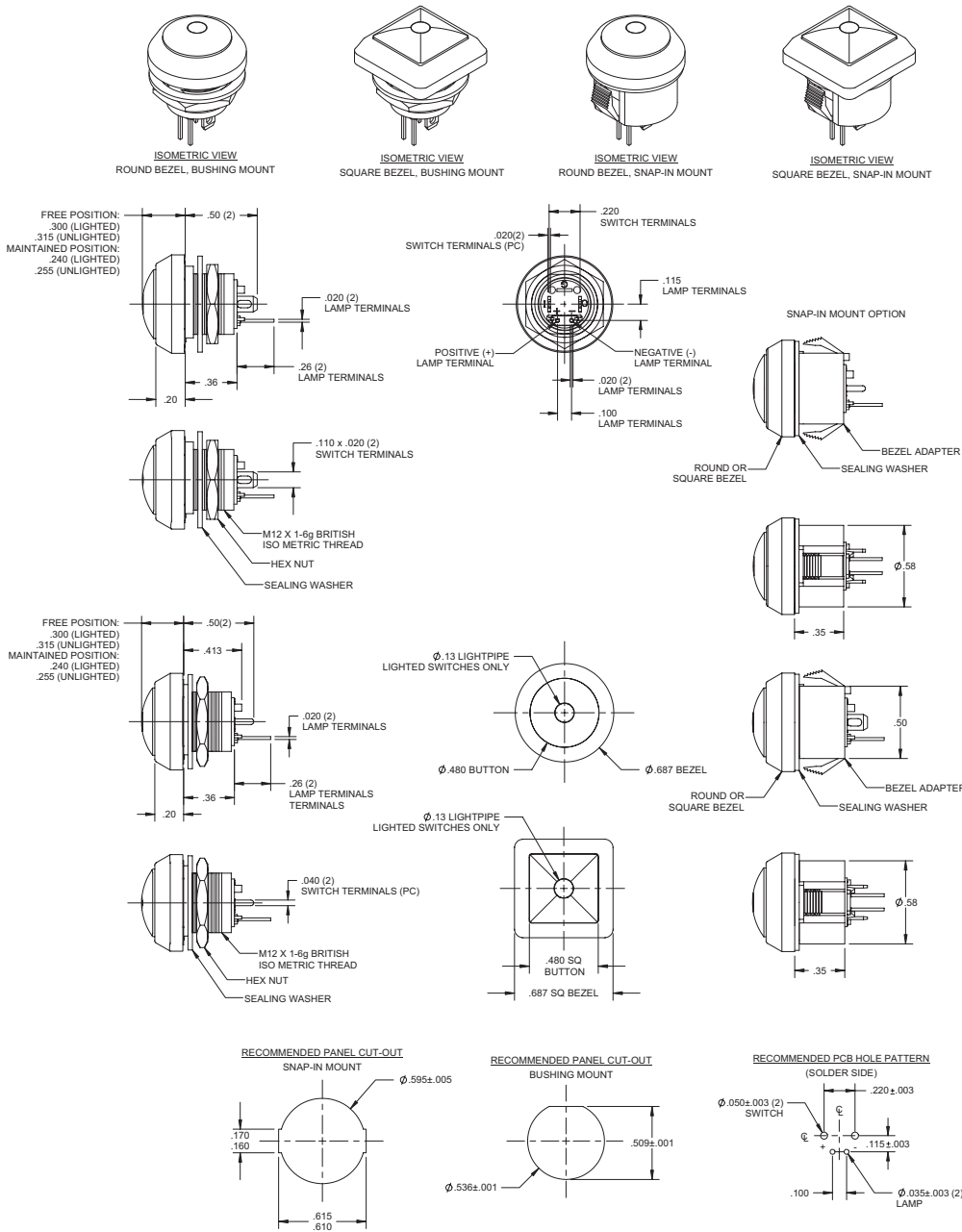
48-

* 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:

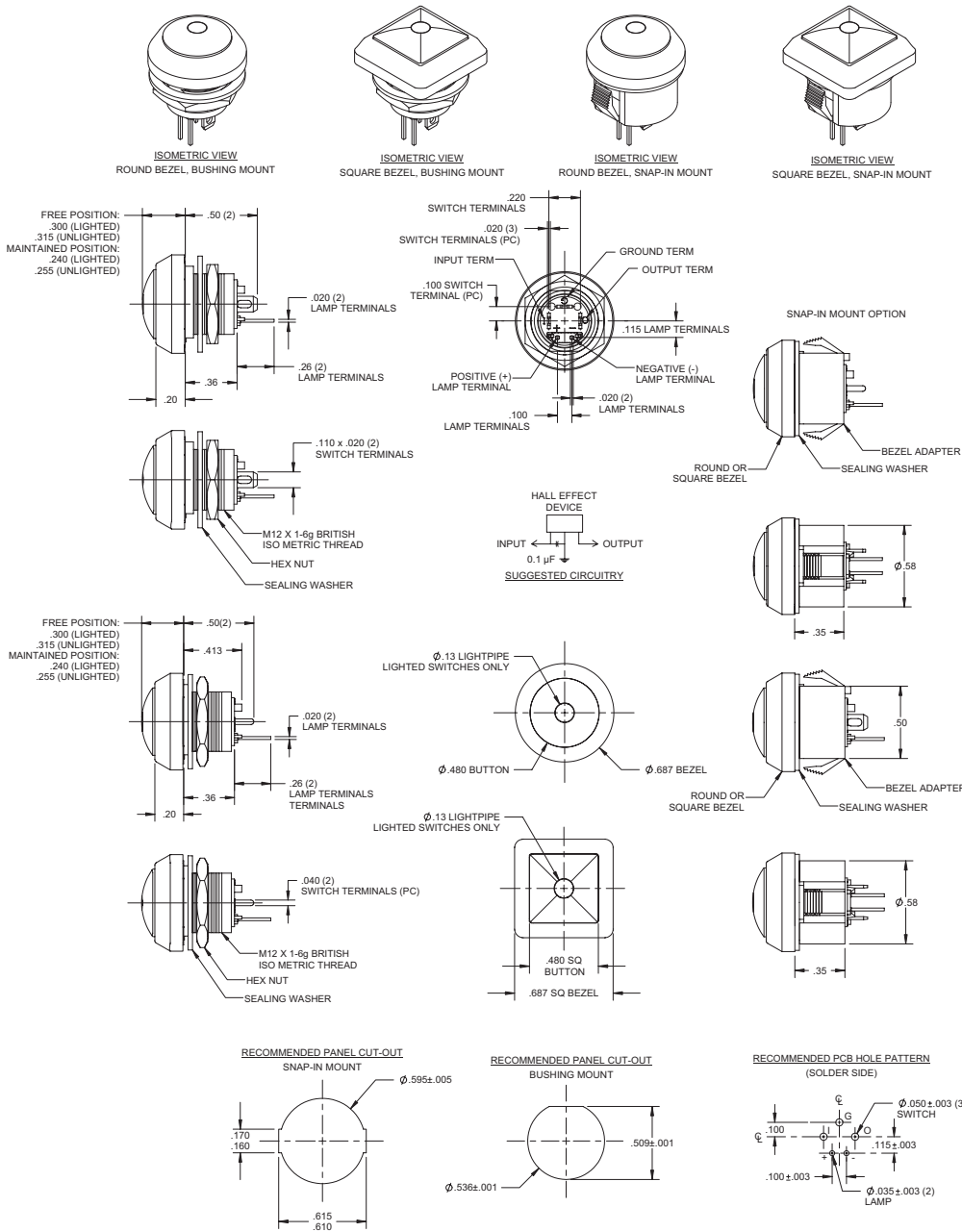
Switch Function	Switch Termination	Module Type	Bezel Type	LED Color	Button Color	Mounting Type	Voltage Resistor
Momentary	Solder Tabs	48-3	RB - Round, Black	N - None	RD - Red	B - Bushing	If Blank*
Maintained	Solder Tabs	48-4	SB - Square, Black	R - Red	GR - Green	S - Snap-fit	05 - 5V forward
Momentary	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

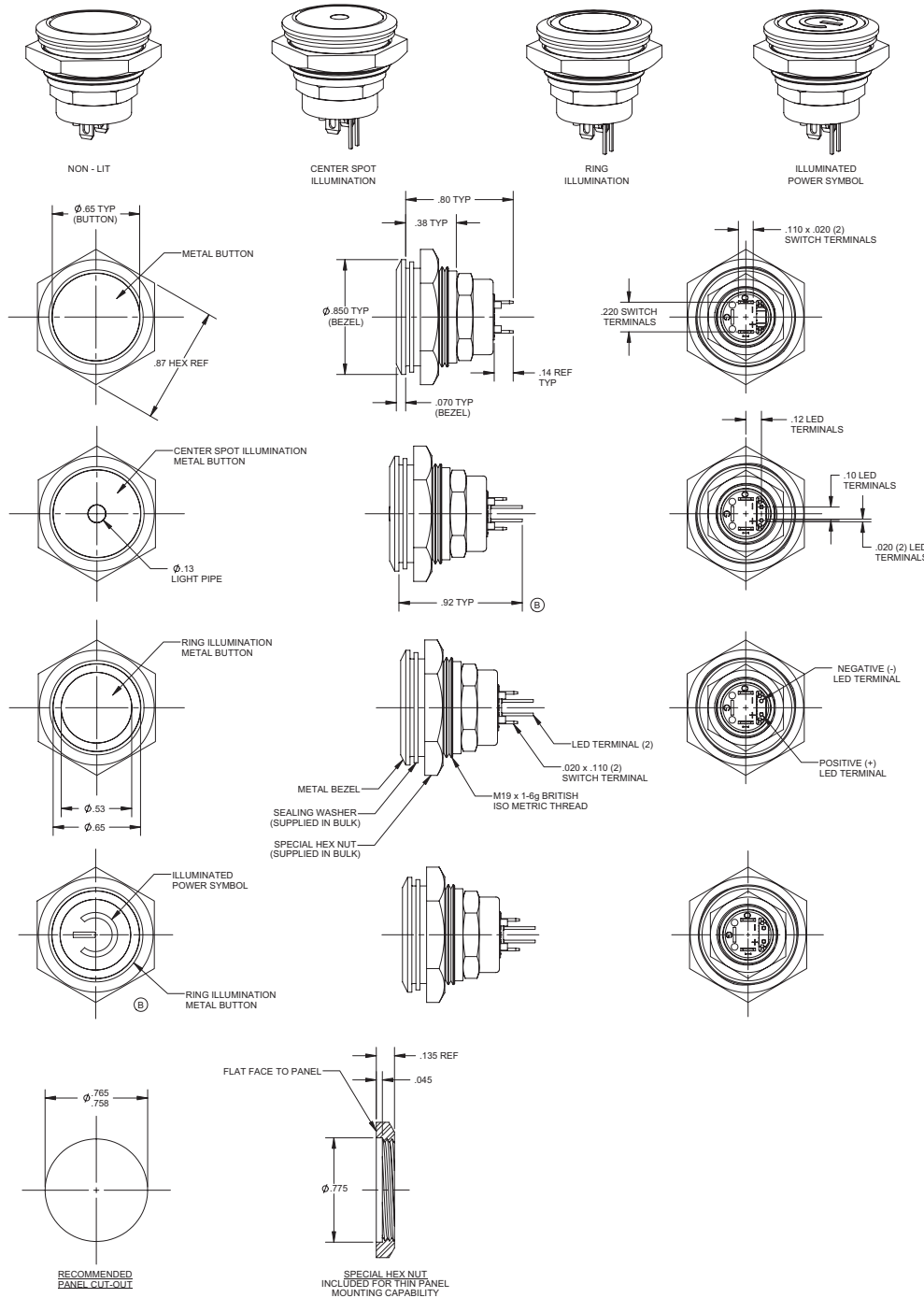
48M-

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

ORDERING INFORMATION:

SWITCH FUNCTION:

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

HOUSING MATERIAL:

1. STAINLESS STEEL
2. ZINC ALLOY CHROME PLATED

ILLUMINATION:

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

LED COLOR:

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

VOLTAGE RESISTOR

- If BLANK *
- 05 5V FORWARD

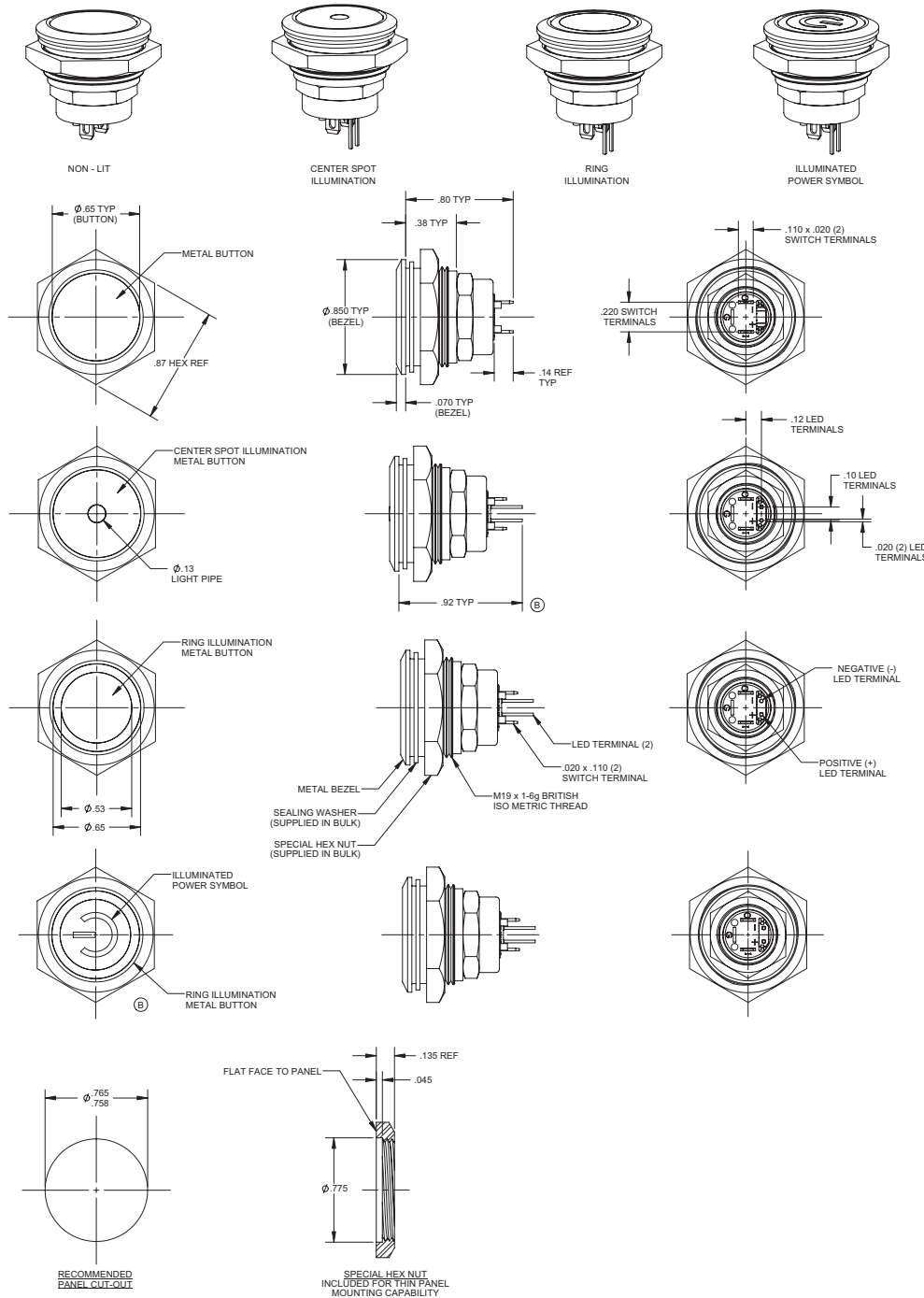
48M-

* 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, Vcc=12V: 3mA Typ.

To 8mA Max.

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

To 8mA Max.

Output current:

20 mA

Reverse battery voltage:

-30V Max.

Reverse output current:

-50 mA Max.

Torque (max):

10 inch pounds

PANEL MOUNTING AND CONSTRUCTION INFORMATION

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

Series 49

MINIATURE SEALED ESD RESISTANT

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

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



ACTUAL SIZE

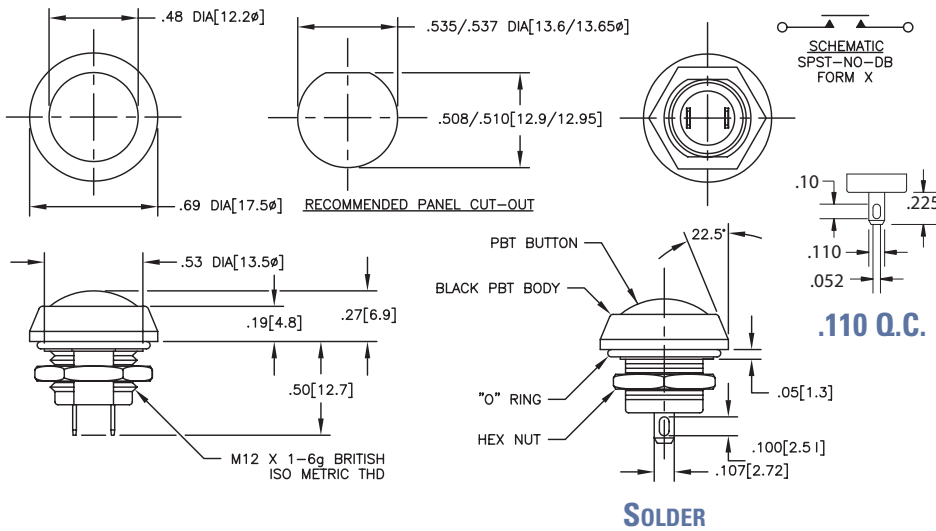
ORDERING INFORMATION:

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

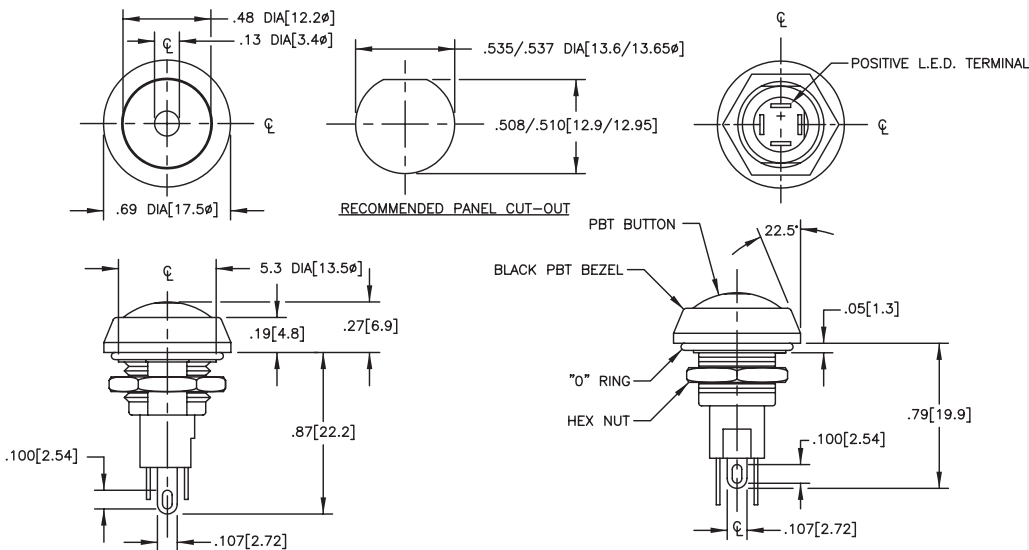
STANDARDS / AGENCY / RATINGS:



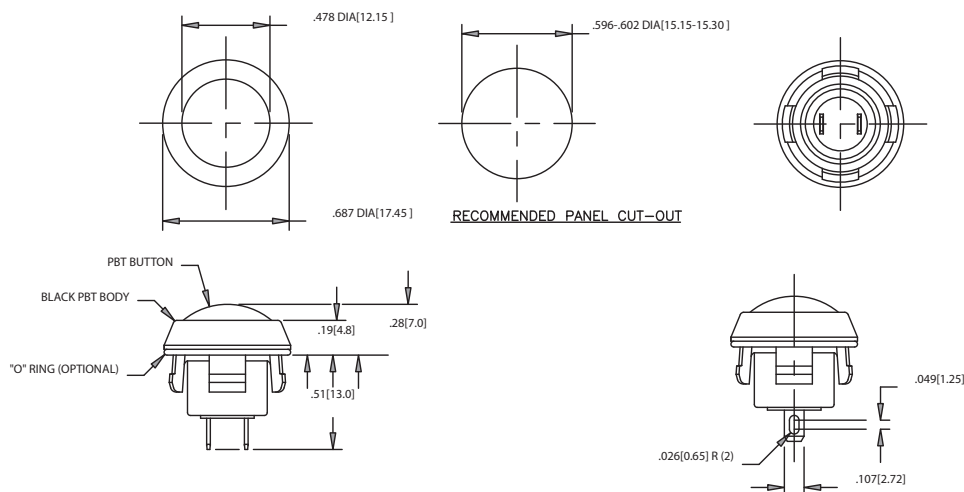
49-11X & 49-61X SERIES



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

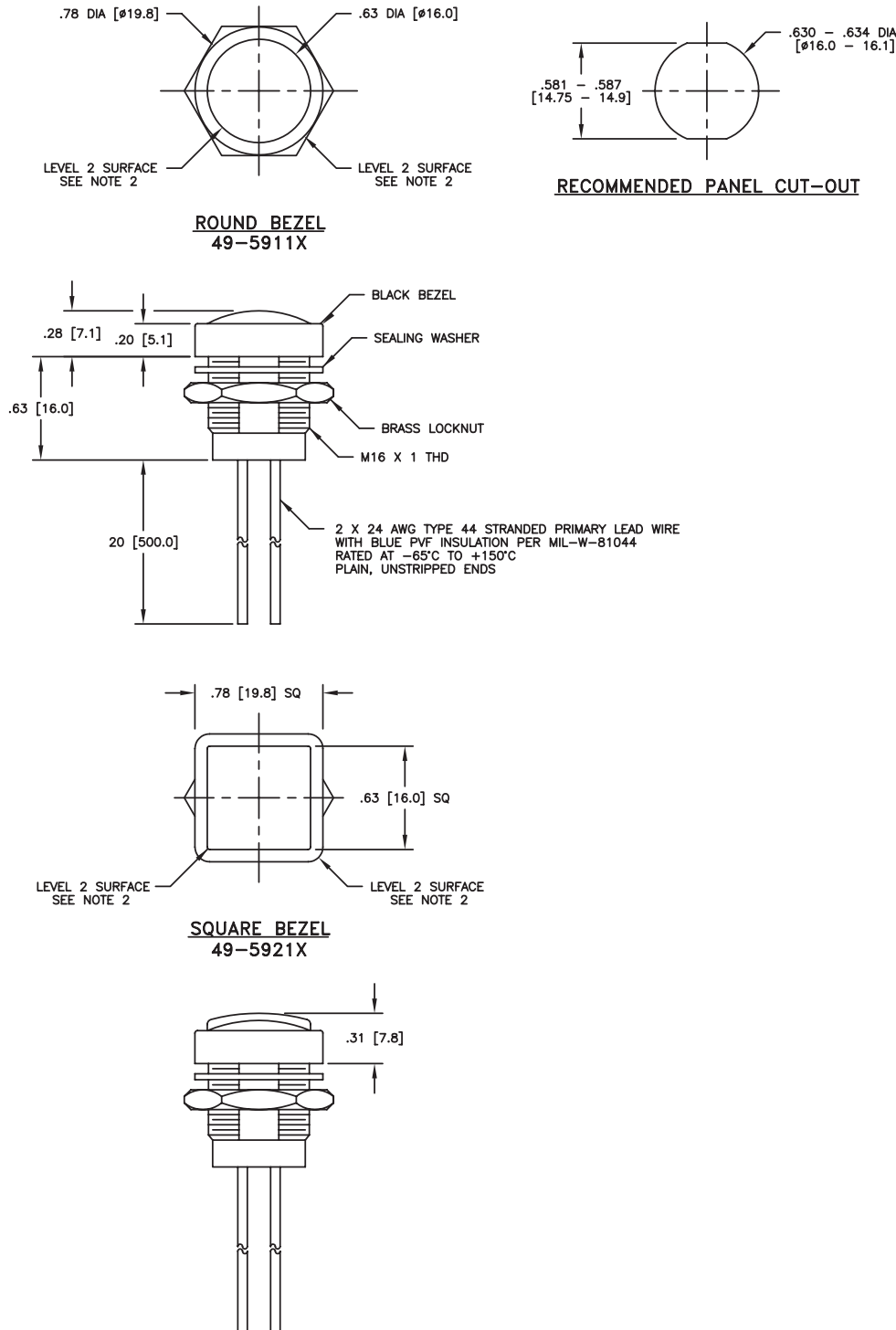
ORDERING INFORMATION:

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

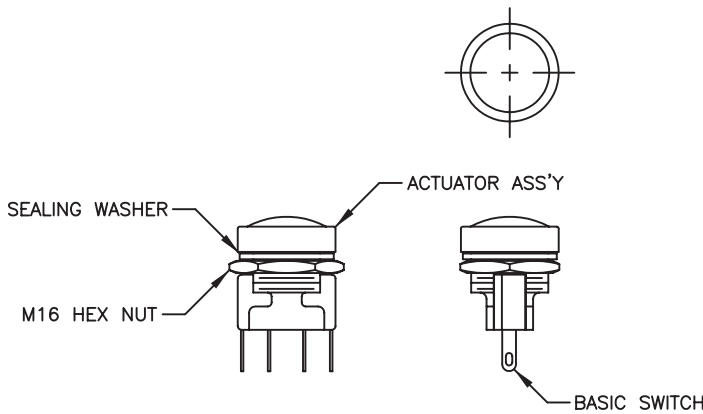
ORDERING INFORMATION:

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

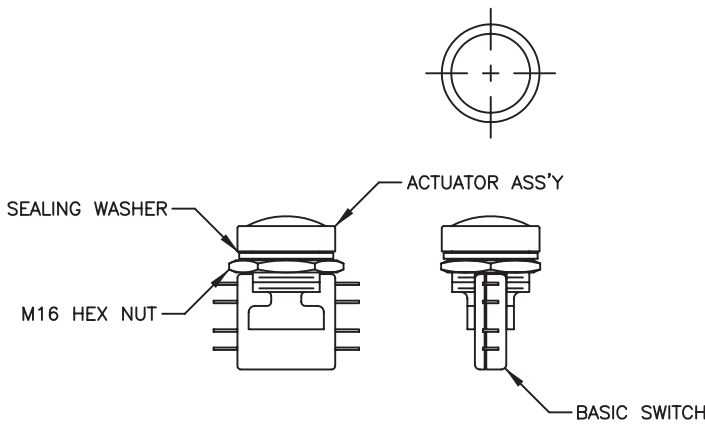
STANDARDS / AGENCY / RATINGS:



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

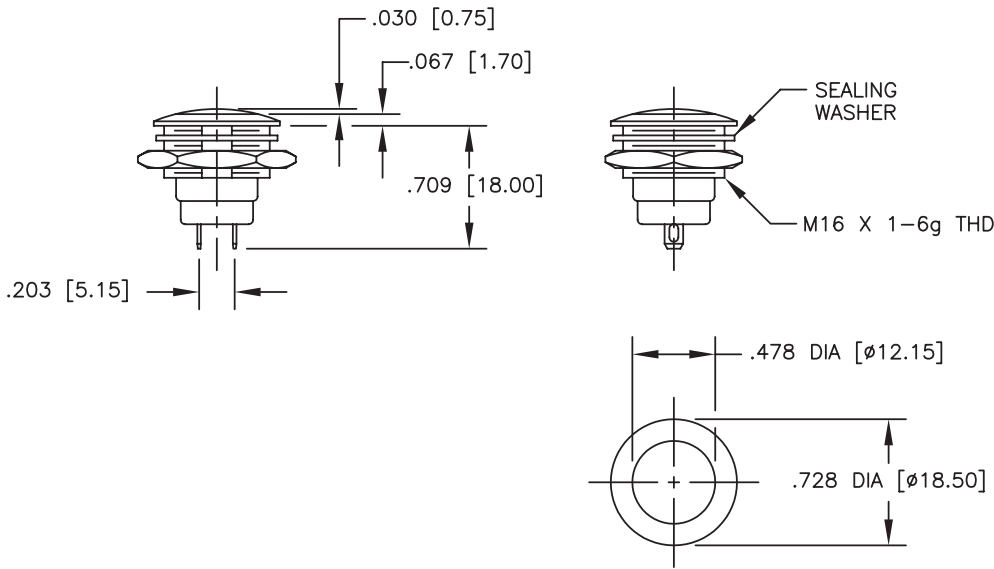
ORDERING INFORMATION:

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

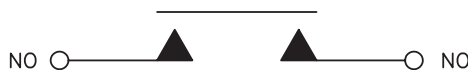
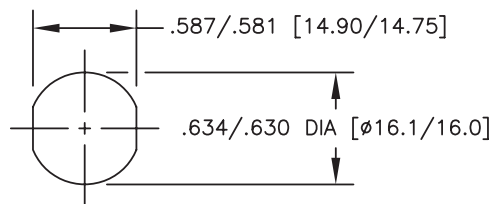
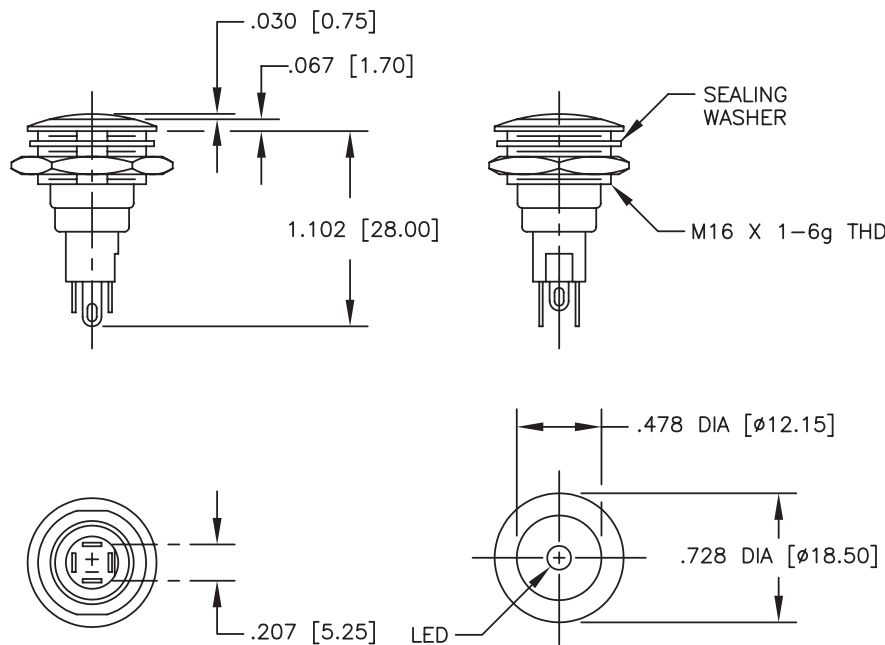
STANDARDS / AGENCY / RATINGS:



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

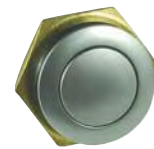
Terminals:
gold plated brass

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:

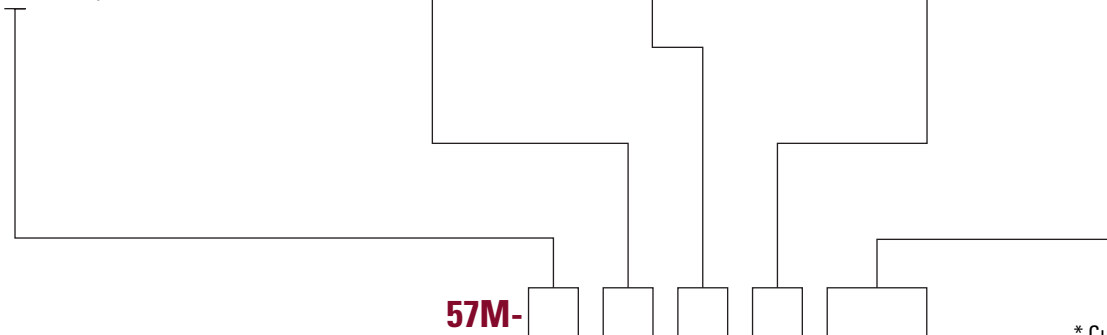
0. NON-LIT
1. CENTER SPOT ILLUMINATION
2. RING ILLUMINATION
3. STANBY LOGO ILLUMINATION

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

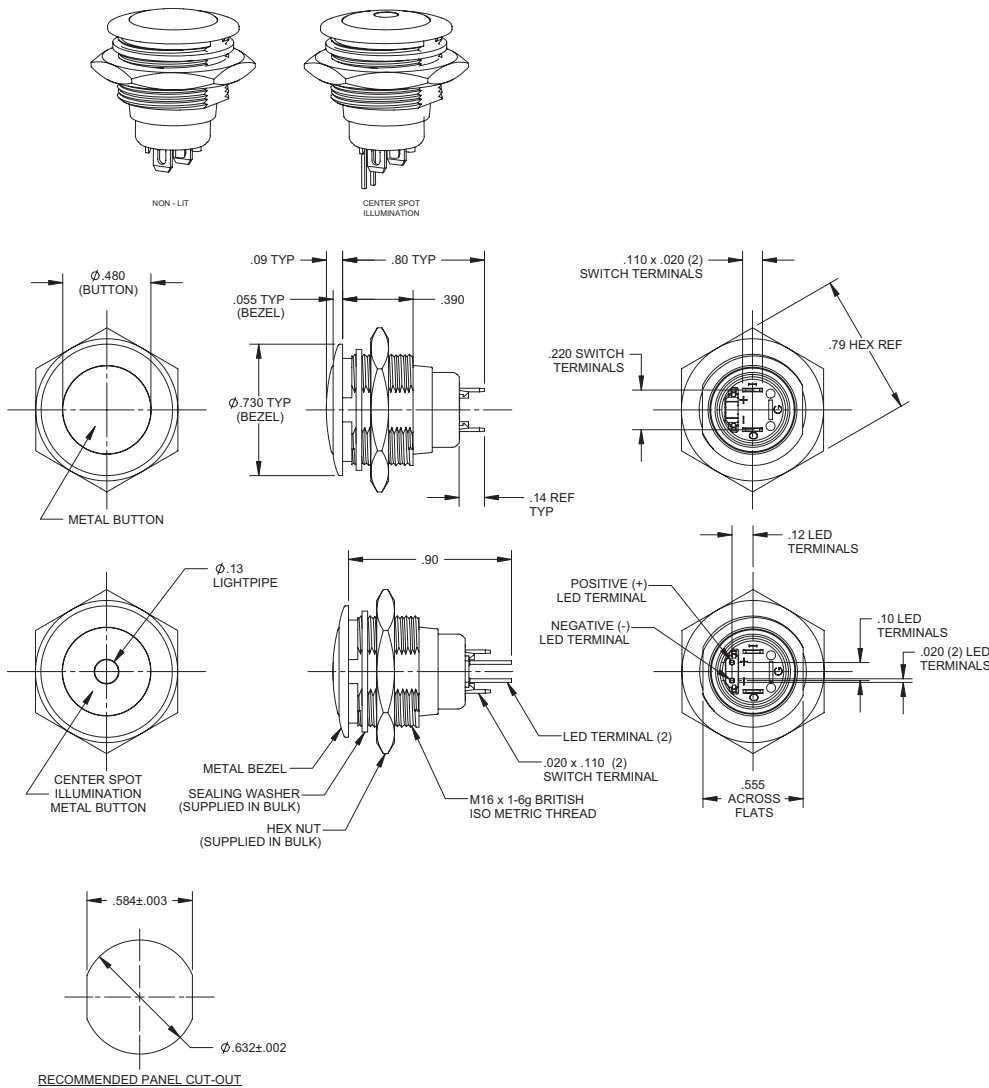


* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

STANDARDS / AGENCY / RATINGS:



PRODUCT DRAWINGS



MECHANICAL / ELECTRICAL CHARACTERISTICS:

- Circuit:**
SPST-NO-DB
- Button travel (nominal):**
0.09 inches / 2.3 mm
- Operating force (nominal):**
3N / 306g
- Contact bounce (nominal):**
1 millisecond
- Panel thickness:**
0.20 – 0.120 inches /
0.5 – 3mm
- Temperature index:**
-40°C to + 85°C
- Torque (max):**
10 inch pounds
- LED operating temperature:**
-13° F to +185° F /
-25° C to +85° C
- Current ratings (resistive):**
250mA @ 12VDC, 100K cycles
150mA @ 28VDC, 150K cycles
(momentary)
100mA @ 48VDC, 100K cycles
10mA @ 12VDC, 1 million cycles
(momentary)

ELECTRO-MECHANICAL

- Dielectric strength:**
1,000 VAC
- Insulation resistance:**
1 GΩ
- Contact resistance:**
50 mΩ max (initial)

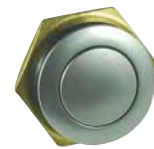
PANEL MOUNTING AND CONSTRUCTION INFORMATION

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

Series 57M-SS

MINIATURE PANEL SEALED METAL

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



ACTUAL SIZE

APPLICATIONS

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

KEY FEATURES:

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

ORDERING INFORMATION:

SWITCH FUNCTION:

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

HOUSING MATERIAL:

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

BUTTON STYLE:

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

LED COLOR:

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

VOLTAGE RESISTOR

- IF BLANK *
- 05 5V FORWARD

57M-

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

STANDARDS / AGENCY / RATINGS:



Series 58M-EM

FULLY SEALED METAL PUSHBUTTON WITH WIRE LEADS

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



ACTUAL SIZE

APPLICATIONS

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

KEY FEATURES:

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

ORDERING INFORMATION:

SWITCH FUNCTION:

- A.** MECHANICAL, MOMENTARY, WIRE LEADS
B. MECHANICAL, MAINTAINED, WIRE LEADS

HOUSING MATERIAL:

- 1.** STAINLESS STEEL
2. ALUMINUM

BUTTON STYLE:

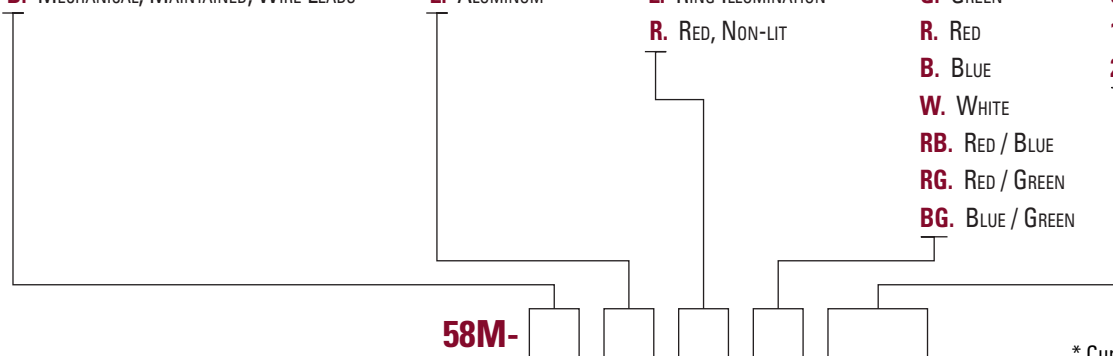
- 0.** NON-LIT
2. RING ILLUMINATION
R. RED, NON-LIT

LED COLOR:

- N.** NONE
G. GREEN
R. RED
B. BLUE
W. WHITE
RB. RED / BLUE
RG. RED / GREEN
BG. BLUE / GREEN

VOLTAGE RESISTOR

- IF BLANK *
05 5V FORWARD
12 12V FORWARD
24 24V FORWARD



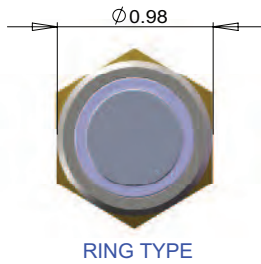
* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

STANDARDS / AGENCY / RATINGS:

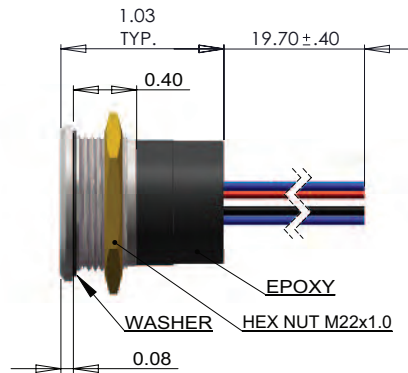


PRODUCT DRAWINGS

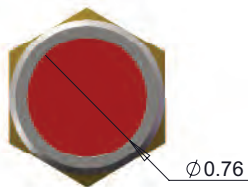
ILLUMINATION



RING TYPE



NON-ILLUMINATION

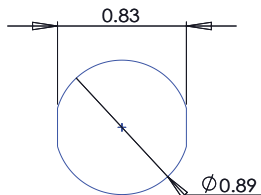


COLORLED TYPE



NON.-LIT. TYPE

RECOMMENDED PANEL CUTOUT



WIRELEADS DESCRIPTION

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

MECHANICAL / ELECTRICAL CHARACTERISTICS:

Circuit:

SPST-NO-DB (Form X)

Button travel (nominal):

0.09 inches / 2.3 mm

Operating force (nominal):

3N / 306 grams

Contact bounce (nominal):

1 millisecond

Panel thickness:

0.50" – 0.150" (1.3 – 3.8mm)

Temperature index:

-40°C to +85°C

Torque (max):

10 inch pounds

LED operating temperature:

-13° F to +185° F /

-25° C to +85° C

Current ratings (resistive):

250mA @ 12VDC, 100K cycles

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

100mA @ 48VDC, 100K cycles

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

ELECTRO-MECHANICAL

Dielectric strength:

1,000 VAC

Insulation resistance:

1 GΩ

Contact resistance:

50 mΩ max (initial)

PANEL MOUNTING AND CONSTRUCTION INFORMATION

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

Series 58M-SS

FULLY SEALED METAL PUSHBUTTON WITH WIRE LEADS

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



ACTUAL SIZE

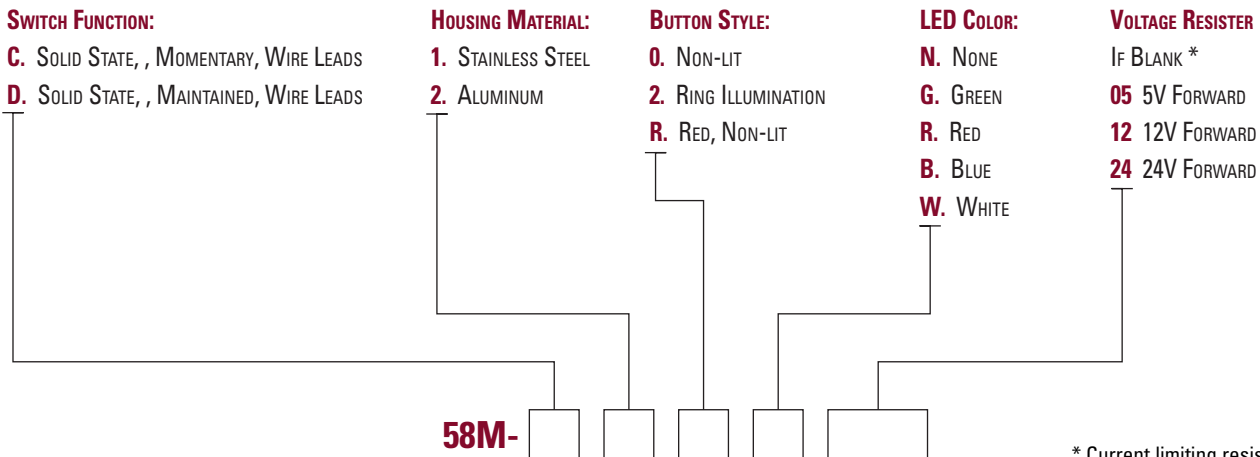
APPLICATIONS

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

KEY FEATURES:

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

ORDERING INFORMATION:



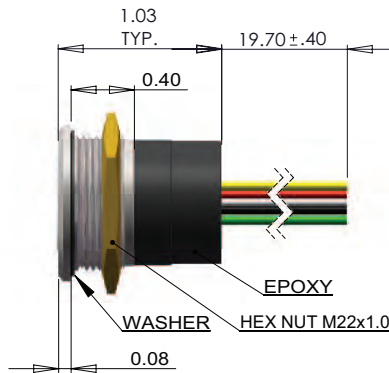
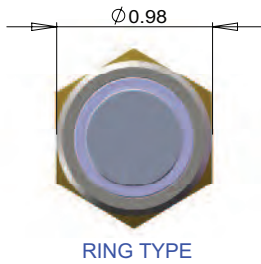
* Current limiting resistor is required to limit LED forward current to 20 mA (not included).

STANDARDS / AGENCY / RATINGS:

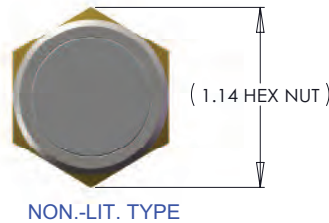
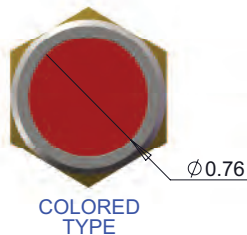


PRODUCT DRAWINGS

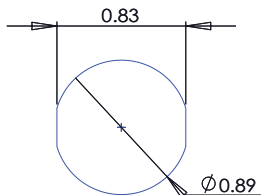
ILLUMINATION



NON-ILLUMINATION



RECOMMENDED PANEL CUTOUT



WIRELEADS DESCRIPTION

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

MECHANICAL / ELECTRICAL CHARACTERISTICS:

Circuit:

SPST-NO-DB (Form X)

Button travel (nominal):

0.09 inches / 2.3 mm

Life (mechanical) (nominal):

1,000,000 cycles (momentary)

100,000 cycles (maintained)

Operating force (nominal):

3N / 306 grams

Panel thickness:

0.02 – 0.12 inches / 0.5 – 3mm

Temperature index:

-40°F to + 185°F

Supply voltage:

4.2V to 24V, 26.5V Max.

Supply current:

B < B_{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 metal hex nut tightened down to a torque of 10 inch pounds to achieve the correct sealing pressure.

MINIATURE METAL PANEL SEALED PUSHBUTTON

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

Series 59



ACTUAL SIZE

APPLICATIONS

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

KEY FEATURES:

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

ORDERING INFORMATION:

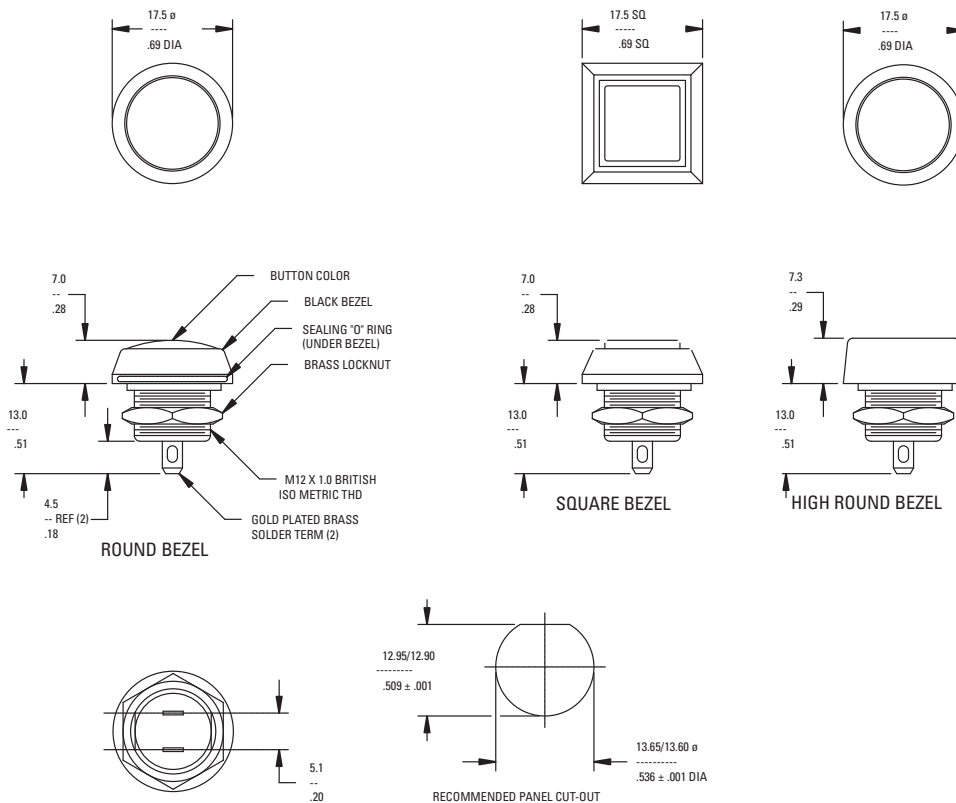
Part Number	Bezel Style	Button Color*
59-111	Round	Black
59-112	Round	Red
59-113	Round	Green
59-211	Square	Black
59-212	Square	Red
59-213	Square	Green
59-311	High Round	Black
59-312	High Round	Red
59-313	High Round	Green

*Consult factory for additional colors.

STANDARDS / AGENCY / RATINGS:



PRODUCT DRAWINGS



PANEL MOUNTING AND CONSTRUCTION INFORMATION

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

MECHANICAL / ELECTRICAL CHARACTERISTICS:

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

Series 76-59

EXTRA TOUGH VANDAL RESISTANT SEALED PUSHBUTTON SWITCH

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



ACTUAL SIZE

APPLICATIONS

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

KEY FEATURES:

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

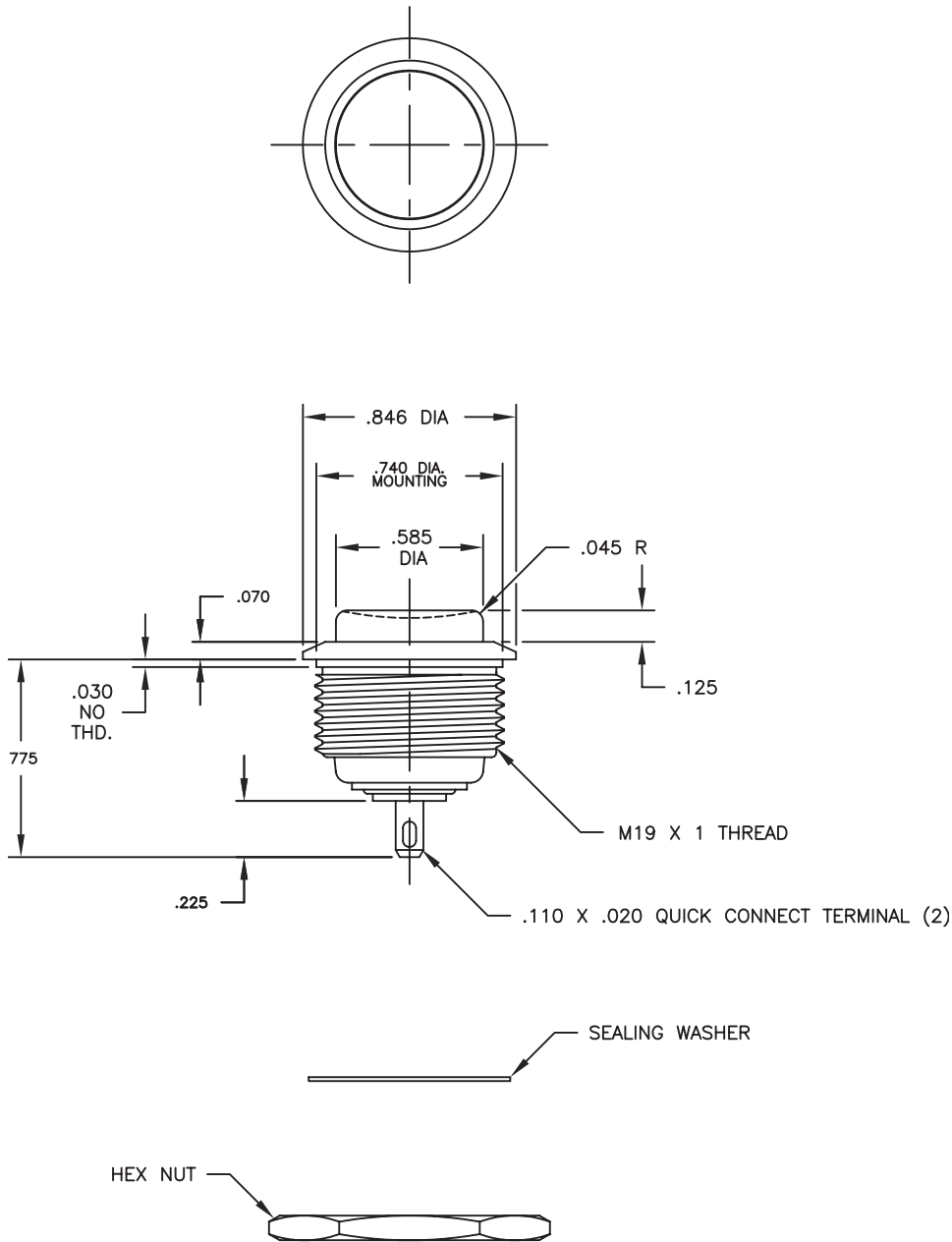
ORDERING INFORMATION:

Part Number	Bushing	Button
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:

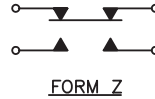
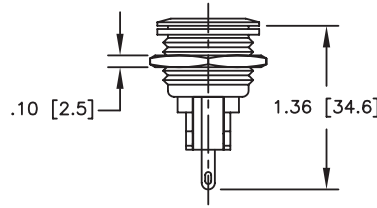
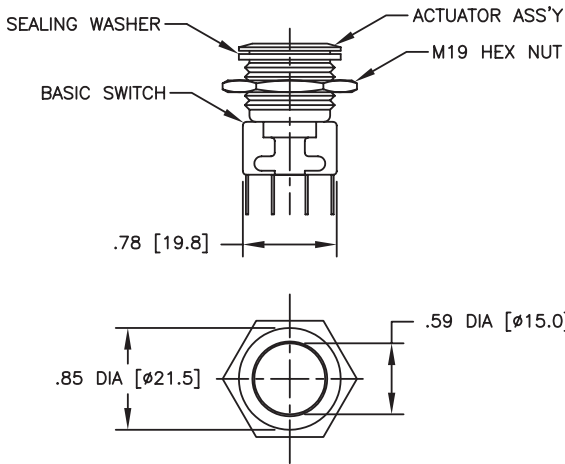
Part Number*	Contacts	Circuit
76-9510/530004	Silver	SPDT-DB
76-9510/810	Enhanced Gold	DPDT-DB

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

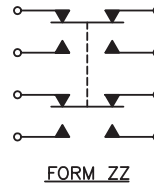
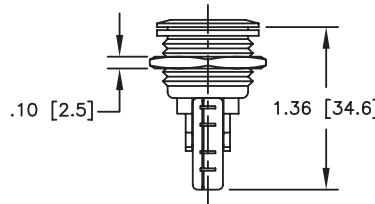
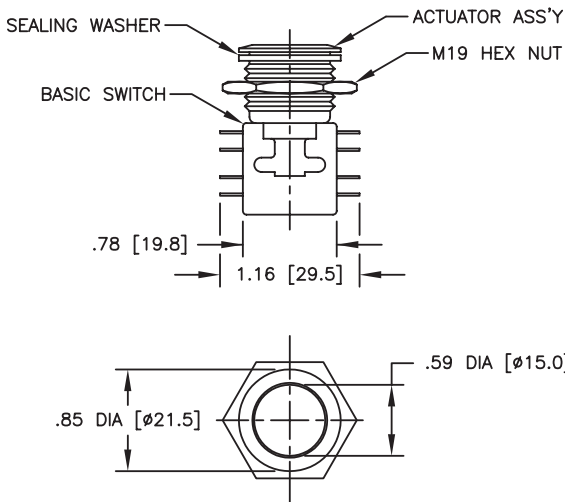
STANDARDS / AGENCY / RATINGS:



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:

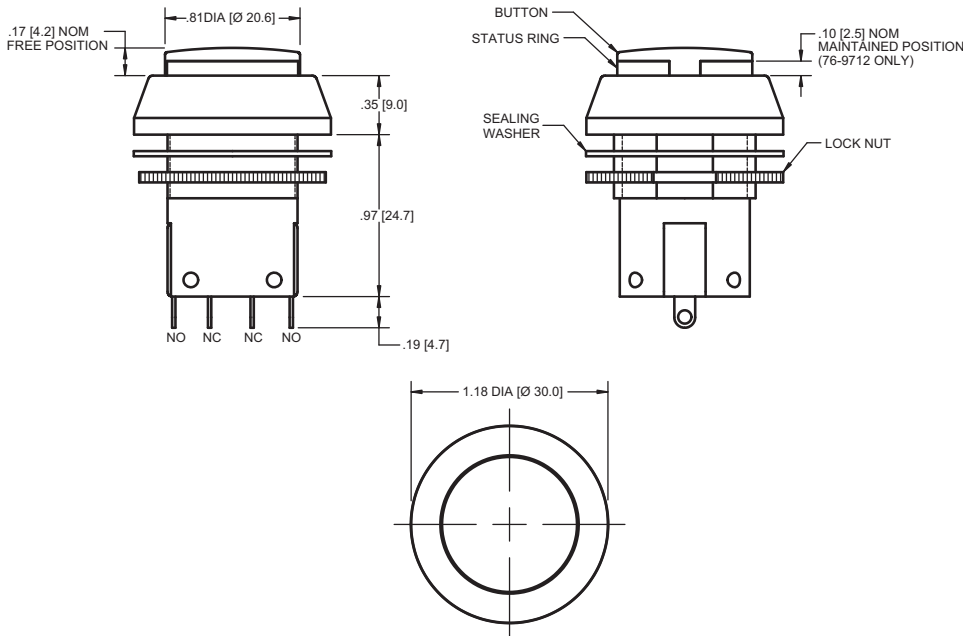
- PCB terminals
- Gold contacts
- 2 poles available
- Color variants
- Surface or sublimation legend printing

*For non-standard options, please consult factory.

STANDARDS / AGENCY / RATINGS:



PRODUCT DRAWINGS



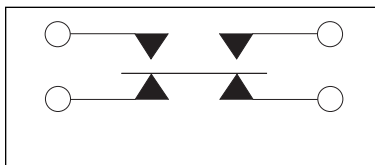
PANEL MOUNTING AND CONSTRUCTION:

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.

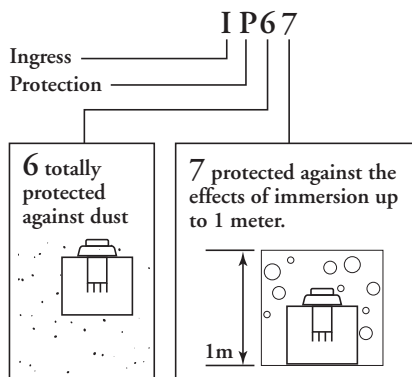
MULTI-POLE INFORMATION:

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.