

**SERIES 14**  
Sealed SMT Key Switch

**FEATURES**

- Sealed against dust while being actuated
- Bright LED illumination
- Excellent tactile feel
- High reliability / long life
- SMT lead free solder process compatible



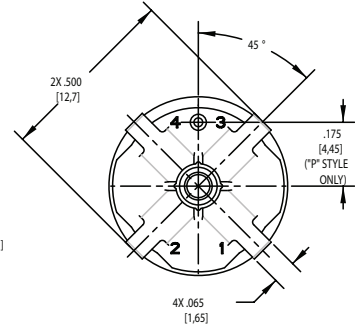
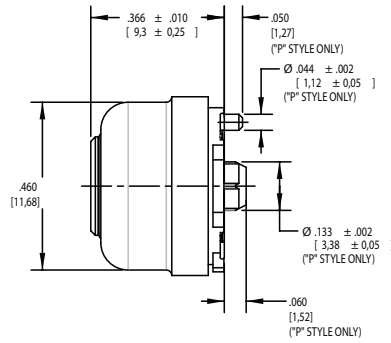
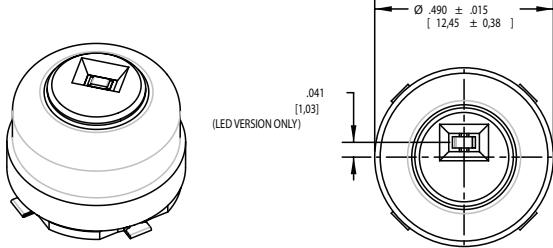
**APPLICATIONS**

- Multi-function handgrip or joysticks in open or closed cab work vehicles
- Handheld remote controllers for robotics & unmanned vehicles
- Portable medical electronics such as defibrillators
- Bellybox (remote control transmitter)
- Marine & motorcycles

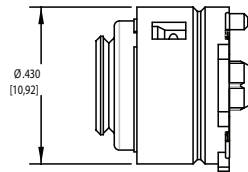
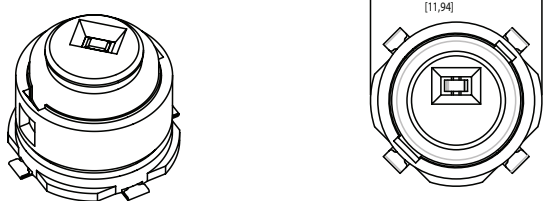
**DIMENSIONS** in inches [and millimeters]

(Unless otherwise noted, standard tolerances are +/- .015 [0, 38] )

**SEALED VERSION**

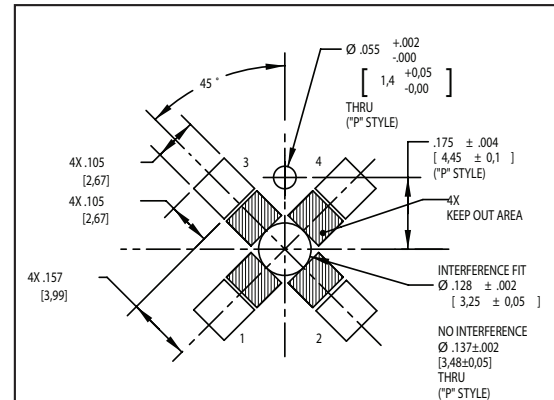
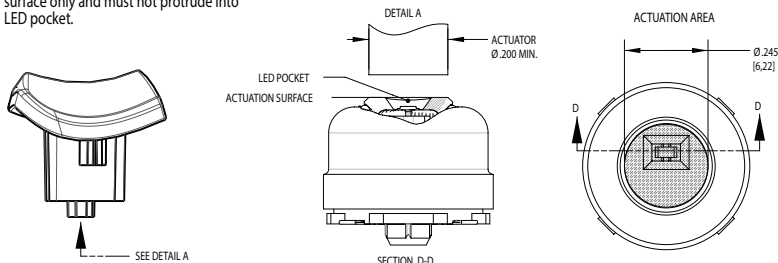


**UNSEALED VERSION**  
(REFER TO SEALED VERSION FOR DIMENSIONS NOT SHOWN)



**RECOMMENDED ACTUATOR DESIGN**

- Axis of actuator to be aligned within  $\varnothing .030"$  of the center of actuation area.
- Actuator must make contact with the actuation surface only and must not protrude into LED pocket.



**RECOMMENDED PCB LAYOUT**  
(THRU HOLES CAN BE OMITTED FOR SWITCH VERSIONS WITHOUT POSTS)

Pushbutton Switches

## RATINGS

- **Operating Temperature Range:**  
-40°C to 85°C
- **Storage Temperature Range:**  
-40°C to 100°C (bulk), -20°C to 60°C (tape)
- **Life Expectancy:**  
14oz, 21oz: 1,000,000 cycles  
32oz: 100,000 cycles
- **Mechanical Shock:** Medium  
Impact: Contact openings/closings <10µs, Method I, shock type M, per MIL-STD-202, Method 213
- **Vibration:** 10-500Hz (10g peak), Contact openings/closings <10µs, Per MIL-STD-202, Method 204, test condition A
- **Weight:** 1.16 grams (14SP-L1)
- **Seal\* (Sealed Switch Versions):**  
Static: IP 67S  
Dynamic: IP6X

\*(Seal applies between rubber boot & switch only.)

## ELECTRICAL & MECHANICAL SPECIFICATIONS

- **Contact Resistance:**  
Initial: 50 milliohms maximum  
After life: 250 milliohms maximum
- **Insulation Resistance:** 10,000 megohms minimum
- **Dielectric Withstanding Voltage:**  
At atmospheric pressure: 500Vac min (50Hz, 60s)
- **Actuation Force:** 14oz, 21oz, 32oz (4N, 6N, 9N)
- **Minimum ESD withstanding (LED Versions):** 2KV
- **Travel:** Total: .06" (1,5 mm)
- **Rated Loads:**  
Min: 10 mA, 2VDC Resistive  
Max: 100 mA, 30VDC Resistive
- **Switch Bounce:** 5ms max throughout life

## MATERIALS & FINISHES

- **Base:** High temp thermoplastic
- **Button:** High temp thermoplastic
- **Contacts/Leads:** Beryllium copper, gold plated
- **Seal:** Silicone
- **ROHS:** Compliant

## REFLOW SOLDERING PROFILE

- Lead free solder process compatible  
(See [www.grayhill.com/products/pushbutton-switches](http://www.grayhill.com/products/pushbutton-switches))



## CIRCUITRY

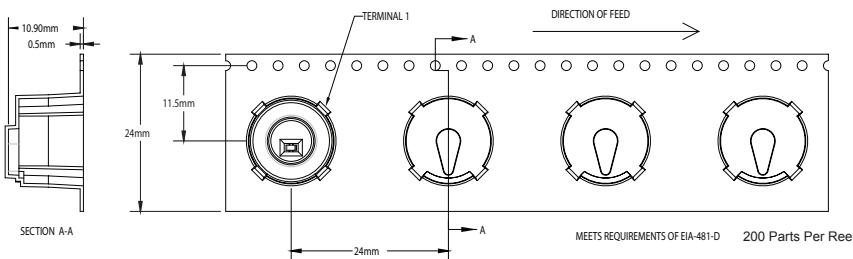
CIRCUIT/CONTACT CONFIGURATION	S1	S2	D1	D2	L1	L2
DIAGRAM						
CIRCUIT	SPST	SPST	DPST	DPST	SPST W/LED	SPST W/LED
CONTACTS	NORMALLY OPEN	NORMALLY CLOSED	NORMALLY OPEN	NORMALLY CLOSED	NORMALLY OPEN	NORMALLY CLOSED

## LED CHARACTERISTICS (@T=25°C)

COLOR	WAVELENGTH	LUMINOUS INTENSITY (mcd)	FORWARD VOLTAGE (V)	FORWARD CURRENT (mA)
RED	630nm	55 MIN, 110 TYP, I = 20mA	2.0 TYP, 2.5 MAX.	20 [30 MAX.]
ORANGE	605nm	55 MIN, 100 TYP, I = 20mA	2.0 TYP, 2.5 MAX.	20 [30 MAX.]
YELLOW	590nm	55 MIN, 120 TYP, I = 20mA	2.0 TYP, 2.5 MAX.	20 [30 MAX.]
GREEN	530nm	71 MIN, 280 MAX, I = 5mA	2.85 TYP, 3.00 MAX.	5 [15 MAX.]
BLUE	470nm	14 MIN, 45 MAX, I = 5mA	2.85 TYP, 3.20 MAX.	5 [15 MAX.]
WHITE	CTR = 8200K	90 MIN, 180 MAX, I = 5mA	2.85 TYP, 3.10 MAX.	5 [15 MAX.]

## TAPE AND REEL PACKAGING

TAPE AND REEL PACKAGING



## ORDERING INFORMATION

Available from your local Grayhill Distributor.

For prices and discounts, contact a local sales office, an authorized local distributor or Grayhill.

Parts packaged in tape and reel, 200 parts per reel. Orders greater than 200 must be in increments of 200.

# 14SP-L1-02-B

14 Series

STYLE

- A = Unsealed
- AP = Unsealed with Posts
- S = Sealed
- SP = Sealed with Posts

CIRCUIT

- S = SPST
- D = DPST
- L = SPST with LED

CONTACTS

- 1 = Normally Open
- 2 = Normally Closed

LED COLOR

- R = Red
- O = Orange
- Y = Yellow/Amber
- G = Green
- B = Blue
- W = White
- (Leave blank for no LED)

OPERATING FORCE

- 01 = 14 oz (Low tactile version)
- 02 = 21 oz
- 03 = 32 oz

