

SERIES 14 Sealed SMT Key Switch

FEATURES

- IP64 Dynamic Seal
- Bright LED illumination
- Excellent tactile feel
- High reliability / long life
- SMT lead free solder process compatible



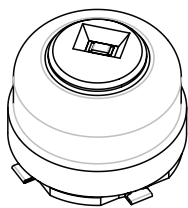
APPLICATIONS

- 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

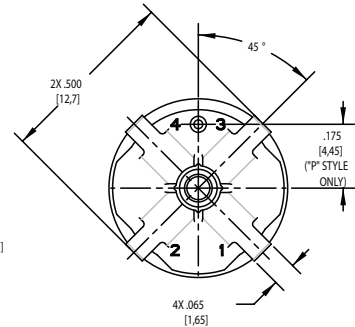
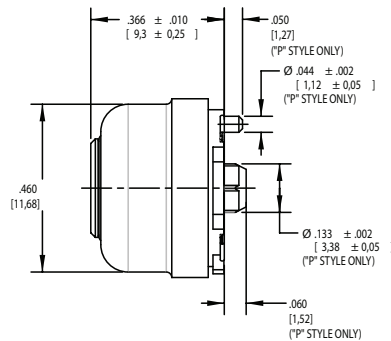
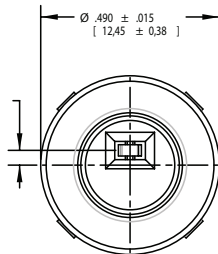
DIMENSIONS in inches [and millimeters]

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

SEALED VERSION

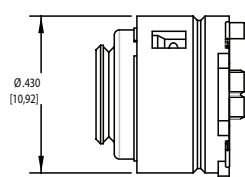
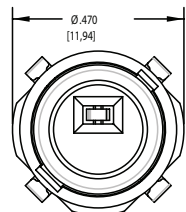
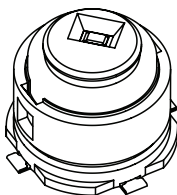


.041
[1,03]
(LED VERSION ONLY)



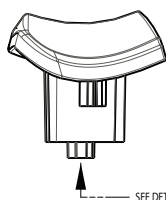
Pushbutton Switches

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

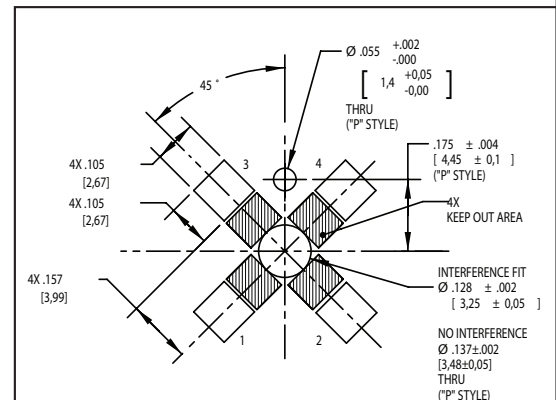
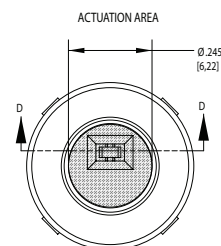
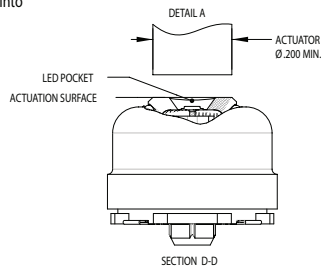


RECOMMENDED ACTUATOR DESIGN

- 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.



SEE DETAIL A



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

RATINGS

- **Operating Temperature Range:** -40°C to 85°C
- **Storage Temperature Range:** -40°C to 100°C (bulk), -20°C to 60°C (tape)
- **Tactile Feedback Life Span:**
 - 14oz: 1,000,000 cycles
 - 21oz: 200,000 cycles
 - 32oz: 100,000 cycles
 (All versions have a functional life of 1M 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* (Rubber Booth & Switch):**
Static: IP 67
Dynamic: IP 64

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)



CIRCUITRY

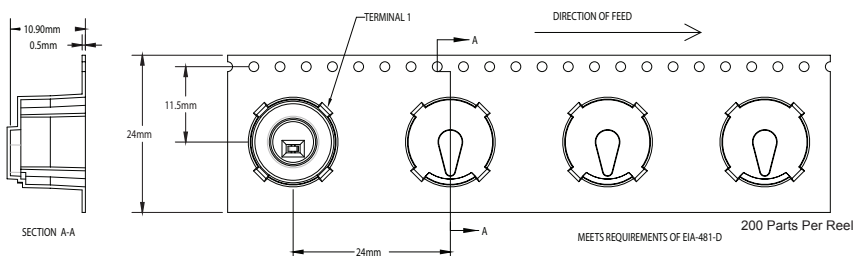
CIRCUIT/CONTACT CONFIGURATION	S1	S2	D1	D2	L1	L2
DIAGRAM						
CIRCUIT	SPST	SPST	DPST	DPST	SPST w/LED	SPST w/LED
CONTACTS	NORMALLY OPEN	NORMALLY CLOSED	NORMALLY OPEN	NORMALLY CLOSED	NORMALLY OPEN	NORMALLY CLOSED

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



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Grayhill:

[14AP-L1-03-B](#) [14AP-L1-02-G](#) [14SP-L1-03-B](#) [14SP-L1-02-G](#) [14AP-L1-03-Y](#) [14AP-L1-03-W](#) [14SP-L1-03-Y](#) [14SP-L1-02-R](#) [14AP-L1-03-R](#) [14SP-L1-02-B](#) [14SP-L1-03-O](#) [14AP-L1-02-R](#) [14AP-L1-03-O](#) [14AP-L1-02-B](#) [14SP-L1-03-R](#) [14SP-L1-02-W](#) [14SP-L1-02-Y](#) [14AP-L1-02-W](#) [14SP-L1-02-O](#) [14AP-L1-03-G](#) [14SP-L1-03-G](#) [14AP-L1-02-O](#) [14AP-L1-02-Y](#) [14SP-L1-03-W](#) [14AP-S1-01](#) [14A-L1-02-G](#) [14A-S1-01](#) [14S-D1-03](#) [14A-L1-02-R](#) [14AP-S1-02](#) [14AP-D1-02](#) [14AP-D1-01](#) [14S-L1-02-G](#) [14SP-D1-01](#) [14S-L1-02-R](#) [14S-D1-02](#) [14SP-D1-02](#) [14SP-S1-03](#)