



GRAYHILL

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



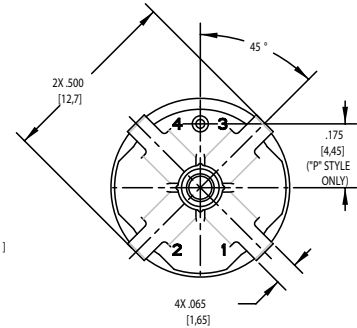
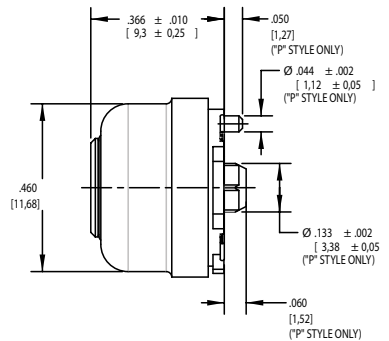
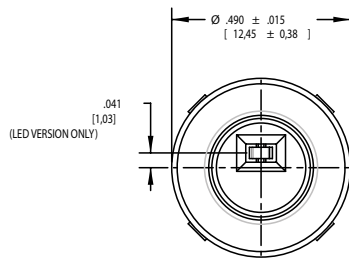
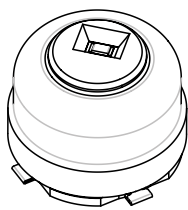
APPLICATIONS

- 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

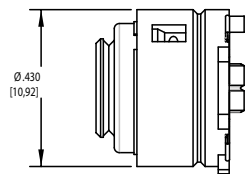
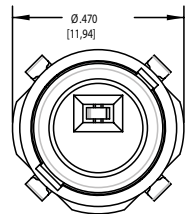
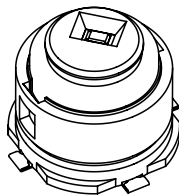
DIMENSIONS in inches [and millimeters]

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

SEALED VERSION

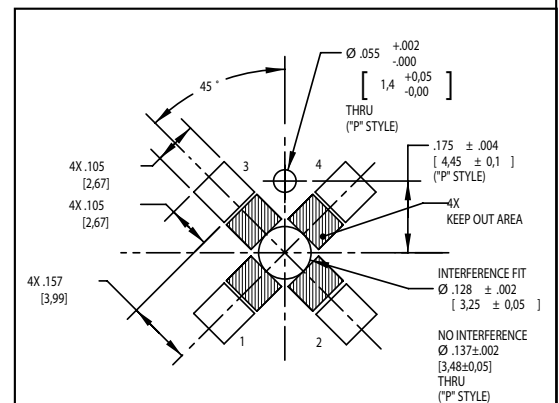
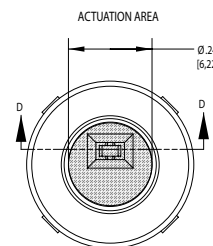
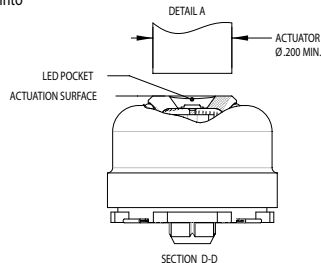
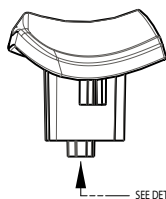


UNSEALED VERSION (REFER TO SEALED VERSION FOR DIMENSIONS NOT SHOWN)



RECOMMENDED ACTUATOR DESIGN

- Axis of actuator to be aligned within Ø.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)



GRAYHILL

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

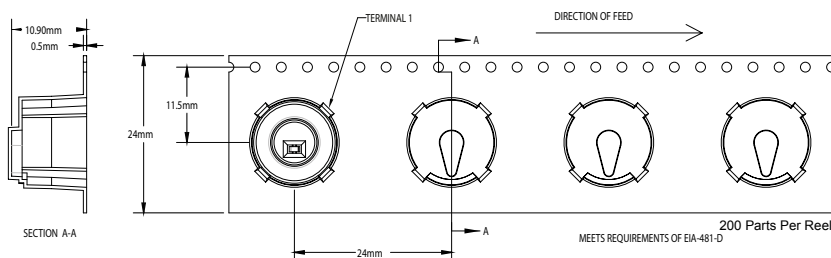
CIRCUIT/CONTACT CONFIGURATION	S1	S2	D1	D2	L1	L2
DIAGRAM						
CIRCUIT	SPST	SPST	DPST	DPST	SPST w/LED	SPST w/LED
CONTACTS	NORMALLY OPEN	NORMALLY CLOSED	NORMALLY OPEN	NORMALLY CLOSED	NORMALLY OPEN	NORMALLY CLOSED

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	LED COLOR
STYLE	R = Red
A = Unsealed	O = Orange
AP = Unsealed with Posts	Y = Yellow/Amber
S = Sealed	G = Green
SP = Sealed with Posts	B = Blue
CIRCUIT	W = White
S = SPST	(Leave blank for no LED)
D = DPST	OPERATING FORCE
L = SPST with LED	01 = 14 oz (Low tactile version)
CONTACTS	02 = 21 oz
1 = Normally Open	03 = 32 oz
2 = Normally Closed	