



A

Pushbutton

# AP Series Industrial Pushbutton Switch

## Features/Benefits

- IP67 sealed
- 1,000,000 life cycle
- Illumination / non-illumination
- Multiple colored caps
- Threaded or snap-in mounting
- Caps available separately
- RoHS compliant

## Typical Applications

- Harsh environments
- Off-Road
- Industrial
- Medical
- Transportation
- Joystick control modules
- Gaming
- Military



## Specifications

FUNCTION: SPST Momentary  
CONTACT ARRANGEMENT: N.O.  
MOUNTING TYPE:  
Snap-in (no panel seal)  
Threaded body (hex nut, lock washer, and panel seal gasket provided)  
Torque spec for threaded body: Do not exceed 8-9 in-lbs (0.9-1.0 N.m)

## Mechanical

OPERATING LIFE: 1,000,000 cycles  
TOTAL TRAVEL:  $2.1 \pm 0.2$  mm  
OPERATING POINT  $1.55 \pm 0.25$  mm  
OVER TRAVEL: 0.6 min.  
OPERATING FORCE:  $4N \pm 1N$  standard configuration; other force  
option  $2N \pm 0.5N$   
VIBRATION: 10-500 Hz 10g Max  
SHOCK: 60g 11ms sawtooth wave

## Electrical

CONTACT RATING:  
200mA @ 24 V DC resistive (500,000 cycles)  
100mA @ 50 V DC resistive (500,000 cycles)  
400mA @ 32 V AC resistive (500,000 cycles)  
125mA @ 125 V AC resistive (1,000,000 cycles)  
DIELECTRIC STRENGTH: 1000 V AC min.  
INSULATION RESISTANCE:  $1 \text{ G } \Omega$  @ 500 VDC  
INITIAL CONTACT RESISTANCE 50 m $\Omega$  max (without wire leads)  
BOUNCE TIME: <5 ms

## Materials

HOUSING: PBT  
BASE: PBT  
CAP: PBT  
ACTUATOR:  
Illuminated: Clear polycarbonate  
Non-illuminated: PBT  
INTERNAL SEAL: Silicone rubber  
TERMINALS: Copper alloy, gold over silver plating  
MOVABLE CONTACT: Copper alloy, gold over silver plating  
TERMINAL SEAL: Epoxy  
WIRE LEADS: UL1569 Black 22 AWG

## Operating Environment

OPERATING TEMPERATURE: -40°C to 85°C (+105°C non-illuminated)  
ESD PROTECTION: 20 KV min.

## Process Environment

SEALING: IP67 for threaded body  
IP65 for snap-in version (no panel seal)

**NOTE:** Specifications and materials listed above are for switches with standard options.  
For information on specific and custom switches, please contact Customer Service.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.

|                                           |                                                                    |                                                                                                                |                                                                                                                                                                      |                                                                                                                                                                                                                          |                                                                                                         |                                                                                   |                                                                       |                                          |
|-------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------|
| <b>Designation</b><br><b>AP</b> AP Series | <b>Operating Force</b><br><b>2</b> 2 Newtons<br><b>4</b> 4 Newtons | <b>Actuator Style</b><br><b>D</b> Dome / Convex<br><b>C</b> Concave<br><b>E</b> Extended Dome<br><b>N</b> None | <b>Actuator Color</b><br><b>0</b> No Cap<br><b>2</b> Black<br><b>3</b> Red<br><b>4</b> Orange<br><b>5</b> Yellow<br><b>6</b> Green<br><b>7</b> Blue<br><b>9</b> Gray | <b>Illumination</b><br><b>00</b> No LED*<br><b>01</b> Super White<br><b>02</b> Bi-color; Red (Green)<br><b>03</b> Red<br><b>05</b> Amber<br><b>06</b> Green<br><b>07</b> Super Blue<br><b>08</b> Bi-color; Amber (Green) | <b>Termination</b><br><b>Z</b> Solder Lug<br><b>W</b> 12" Wire Leads 22 AWG<br><b>C***</b> PC Terminals | <b>Bushing Style**</b><br><b>S**</b> Snap-in plastic<br><b>T</b> Threaded plastic | <b>Terminal Seal</b><br><b>E</b> Epoxy<br>All models are epoxy sealed | <b>Contact Material</b><br><b>B</b> Gold |
|-------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------|

Please contact Customer Service for additional colors and paint / laser etched button options.

\* No LED available in short body only

\*\* No panel seal option  
\*\*\* PC terminals not available with illumination

Contact Customer Service for additional hardware options.



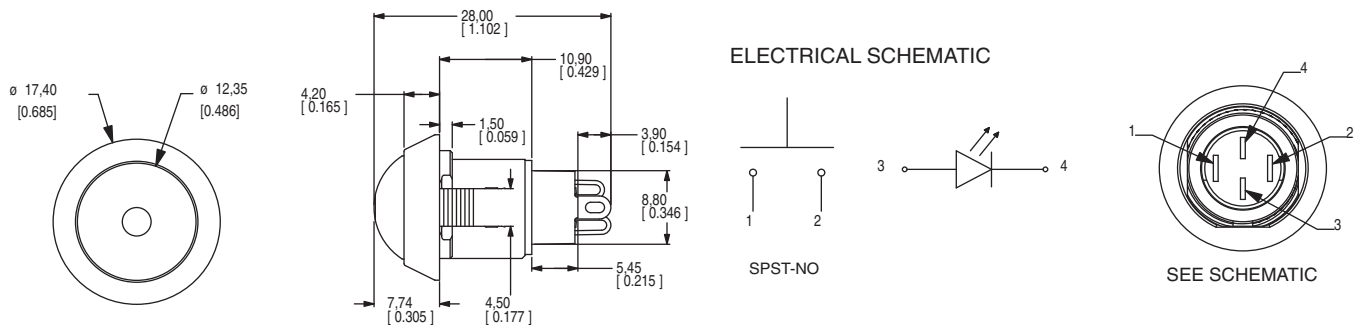
# AP Series Industrial Pushbutton Switch



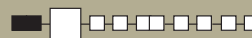
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## STANDARD VIEW

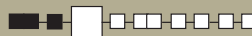


## OPERATING FORCE

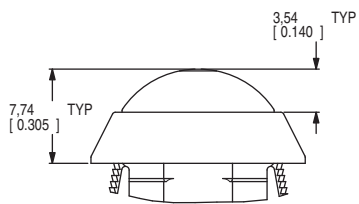


| OPTION CODE | OPERATING FORCE |
|-------------|-----------------|
| 2           | 2 N, 200 g      |
| 4           | 4 N, 400 g      |

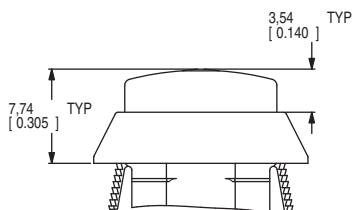
## ACTUATOR STYLE



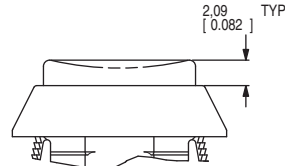
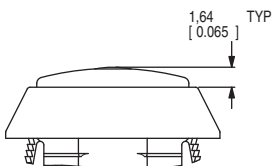
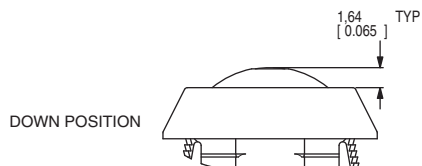
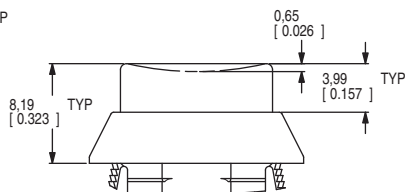
### D DOME / CONVEX



### E EXTENDED DOME



### C CONCAVE

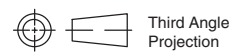


## ACTUATOR COLOR



| OPTION CODE | ACTUATOR COLOR |
|-------------|----------------|
| 0           | No Cap         |
| 2           | Black          |
| 3           | Red            |
| 4           | Orange         |
| 5           | Yellow         |
| 6           | Green          |
| 7           | Blue           |
| 9           | Gray           |

For additional colors please contact Customer Service.



Third Angle  
Projection



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Dimensions are shown: mm (inches)  
Specifications and dimensions subject to change

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# AP Series Industrial Pushbutton Switch

## ILLUMINATION



| OPTION CODE | ILLUMINATION TYPE            | TYPICAL INTENSITY* |       | PEAK WAVELENGTH | Vf Forward Voltage |
|-------------|------------------------------|--------------------|-------|-----------------|--------------------|
|             |                              | MIN                | MAX   |                 |                    |
|             |                              | (mcd)              |       | (nm)            |                    |
| 00          | Model without illumination   | N/A                |       | N/A             |                    |
| 01          | LED Super White              | 4,000              | 5,000 | N/A             | 3.5                |
| 02          | LED Bi-Color – Red (Green)   | 10                 | 20    | 635/565         | 2.0                |
| 03          | LED Red                      | 4                  | 8     | 700             | 2.0                |
| 05          | LED Amber                    | 35                 | 50    | 610             | 2.0                |
| 06          | LED Green                    | 35                 | 50    | 565             | 2.0                |
| 07          | LED Super Blue               | 800                | 1,500 | 470             | 3.8                |
| 08          | LED Bi-Color – Amber (Green) | 10                 | 10    | 585/565         | 2.0                |

\*LED FORWARD CURRENT: 20 mA

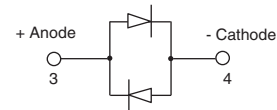
LED FORWARD VOLTAGE: see chart above

LED REVERSE VOLTAGE: 5.0 V MAX

\* For information on specific and custom LED, please contact Customer Service.

### NOTE:

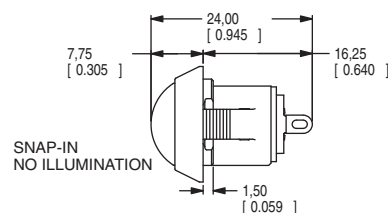
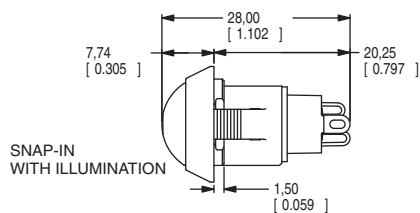
For bi-color LED's the polarity must be reversed to alternate the color



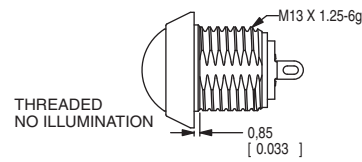
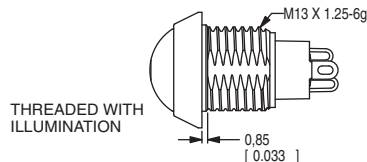
## BUSHING STYLE



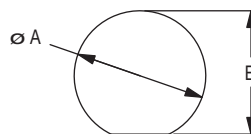
### S SNAP-IN



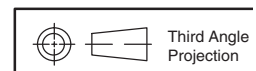
### T THREADED PLASTIC



### PANEL CUTOUT



| PANEL THICKNESS                           | DIM A (± 0.05 mm)      | DIM B (± 0.05 mm)      |
|-------------------------------------------|------------------------|------------------------|
| 1 mm<br>[0.039 in]                        | 13.70 mm<br>[0.539 in] | 13.00 mm<br>[0.512 in] |
| 2 mm<br>[0.079 in]                        | 13.80 mm<br>[0.539 in] | 13.00 mm<br>[0.512 in] |
| 3 mm<br>[0.118 in]                        | 13.90 mm<br>[0.547 in] | 13.10 mm<br>[0.516 in] |
| THREADED BODY<br>MIN PANEL THICKNESS 1 mm | 13.70 mm<br>[0.539 in] | 13.00 mm<br>[0.512 in] |



Third Angle  
Projection



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A 0.1mm min. chamfer on the leading edge of the mounting hole is recommended for snap-in version.

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# AP Series Industrial Pushbutton Switch

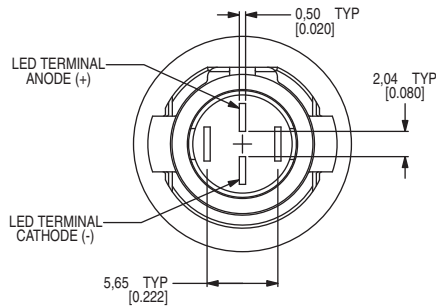
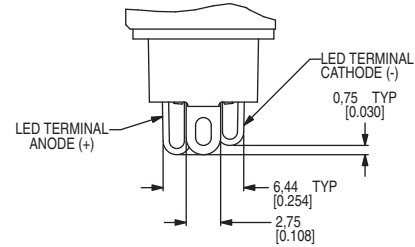
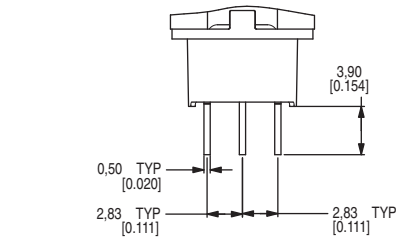


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## TERMINATION

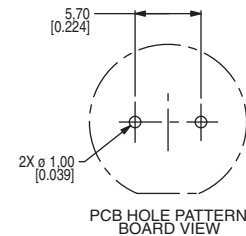
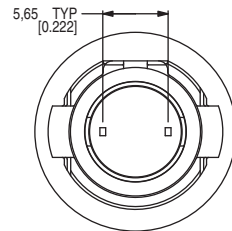
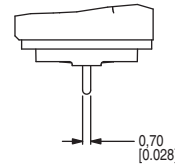
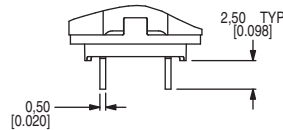
### Z SOLDER LUG



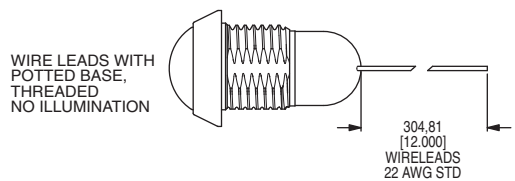
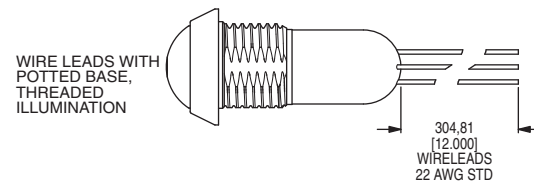
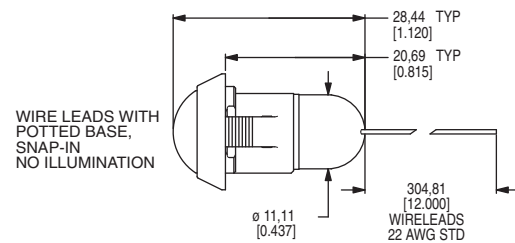
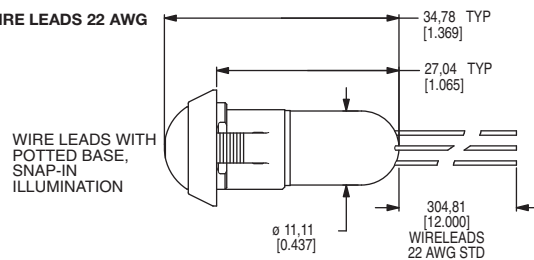
\* Switching terminals are gold and LED terminals are silver

### C PC TERMINALS

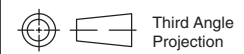
\*\*\* Illumination not available with PC Terminals



### W 12" WIRE LEADS 22 AWG



Wires: Black wires - Terminals  
Red wires - LED (+) Positive  
White wire - LED (-) Negative





# AP Series Industrial Pushbutton Switch

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## CONTACT MATERIAL



**B** GOLD

| OPTION CODE | CONTACT MATERIAL |
|-------------|------------------|
| <b>B</b>    | Gold             |

## TERMINAL SEAL



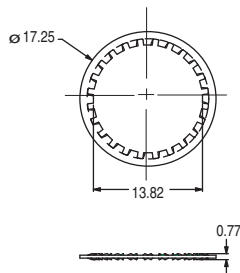
**E** EPOXY

All models are epoxy sealed

## HARDWARE

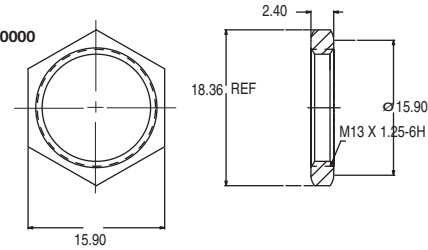
### LOCK WASHER

Part Number 647D00000



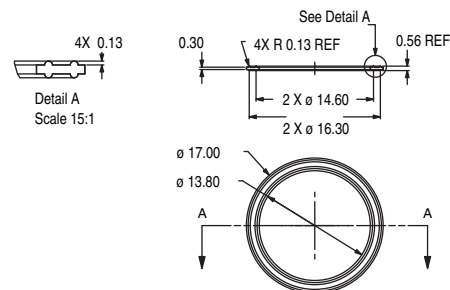
### HEX NUT

Part number 515D00000



### PANEL SEAL

Part Number 655D00000

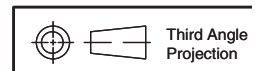


Caps available on next page



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Third Angle  
Projection

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## AVAILABLE CAPS



481D XX XXX

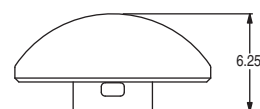
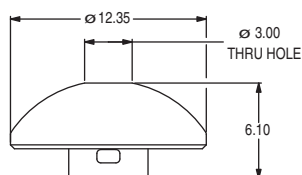
Cap Color  
Style

| OPTION | CAP COLOR |
|--------|-----------|
| 01     | WHITE     |
| 02     | BLACK     |
| 03     | RED       |
| 04     | ORANGE    |
| 05     | YELLOW    |
| 06     | GREEN     |
| 07     | BLUE      |
| 08     | BROWN     |
| 09     | GRAY      |

| PART NUMBER | HOLE | STYLE         |
|-------------|------|---------------|
| 481DXX000   | NO   | DOME          |
| 481DXX001   | YES  | DOME          |
| 481DXX002   | NO   | EXTENDED DOME |
| 481DXX003   | YES  | EXTENDED DOME |
| 481DXX004   | NO   | CONCAVE       |
| 481DXX005   | YES  | CONCAVE       |

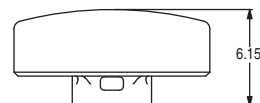
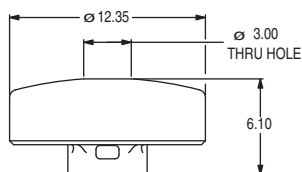
### DOME

481DXX000 = NO HOLE  
481DXX001 = HOLE



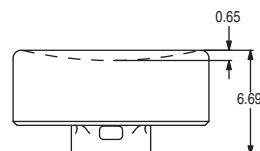
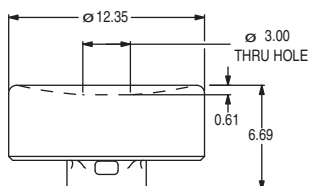
### EXTENDED DOME

481DXX002 = NO HOLE  
481DXX003 = HOLE



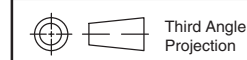
### CONCAVE

481DXX004 = NO HOLE  
481DXX005 = HOLE



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Third Angle  
Projection

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