

## MOMENTARY ACTION, SEALED, SNAP-ACTION, DOUBLE BREAK

The P1 offers a mechanical life that is well beyond the 50,000 cycles required by MIL-PRF-8805. The double break switching mechanism has an incredibly fast transfer time, reducing arcing and increasing contact life. The inherent wiping action breaks welds and scrubs the contacts clean on every actuation.

The P1 switch offers vastly improved life under extreme conditions found in most military environments. Moistureproofing is accomplished in two ways. The pushbutton is sealed with a silicone boot operating on our patented "rolling sleeve," providing longer life and smoother operation over a wide temperature range. Epoxy seals protect the contacts and terminals from hostile environments and solder flux.

Watertight sealing to Commercial (IP68S) and Military (MIL-PRF-8805 Design 3) standards are available. This watertight design is also available in commercial construction as the P3 series (add "W" to your part number).

High contact force (120g/4.2 oz), low contact resistance (25mΩ max initial) and short contact bounce result from our snap-action mechanism. These characteristics guarantee exceptional current carrying capabilities over the life of the switch. With the optional low level (gold plate) configuration, the P1 is well suited to interface directly to computers and other solid state devices.

The P1 switch is a quality precision snap-action switch designed for use in panel boards, control grips, computers, instruments, pressure switches and other hand or machine operated applications where sealed pushbutton switches are required. Its precision permits the P1 to be used as a limit switch with unique size, high electrical ratings and a wide choice of mounting styles.

## Features:

- Button sealed with patented "rolling sleeve" principle
- Contact area sealed at button & terminals
- Less than 25mΩ initial contact resistance
- Ideal for low level switching as well as up to 10 amp duty
- Positive tactile feedback
- Variety of mounting styles
- Engraved buttons & bezels available
- UL recognized & CSA certified
- Watertight to IP68S available
- RoHS compliant



### Standard Characteristics/Ratings:

#### ELECTRICAL RATINGS:

| Load           | Sea Level @ 28VDC<br>or 115VAC, 60/400Hz | 50,000 feet @ 28VDC<br>or 115VAC, 60/400Hz |
|----------------|------------------------------------------|--------------------------------------------|
| Resistive      | 10A                                      | N/A                                        |
| Inductive      | 5A                                       | 5A                                         |
| Lamp           | 3A                                       | N/A                                        |
| Motor          | 3A                                       | N/A                                        |
| Center Contact | 3A max                                   | N/A                                        |
| DWV            | 1000Vrms                                 | 400Vrms                                    |
| Low Level      | 10mA @ 30mV max DC or peak AC            |                                            |

**Electrical Life:** 25,000 cycles

**Mechanical Life:** 50,000 cycles, circuit forms 3, 4, & 5  
250,000 cycles, circuit forms 1, 2 & 6

**Seal:** MIL-PRF-8805 Design 2 or  
Watertight per IP68S or MIL-PRF-8805 Design 3

**Operating Temp Range:** -55°C to +85°C

**Operating Force:** 2.5 lbs. or 4.0 lbs.

**Reset Force:** 0.75 lb. or 1.0 lb.

**Total Travel:** 0.085 +/- 0.015 inches

**Overtravel:** 0.012 inches min

**Movement Differential:** 0.015 inches min

#### MATERIALS:

**Case:** Black anodized aluminum alloy

**Button:** Thermoplastic

**Terminals:** Brass with silver plate, gold plate for low level

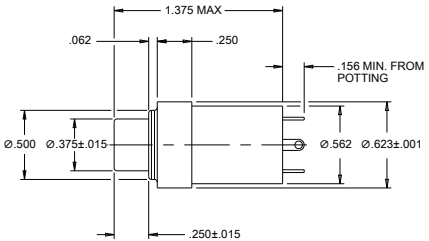
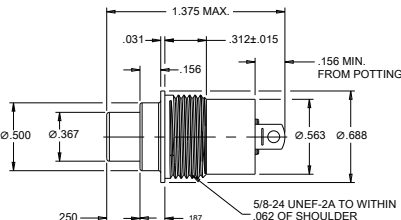
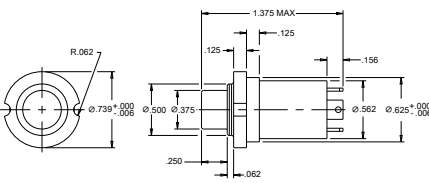
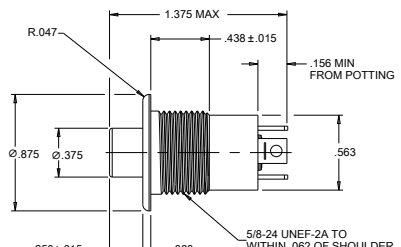
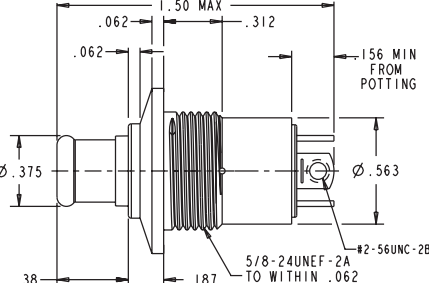
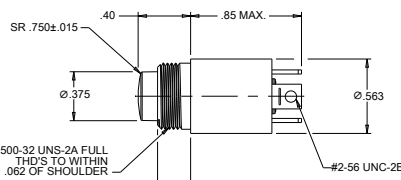
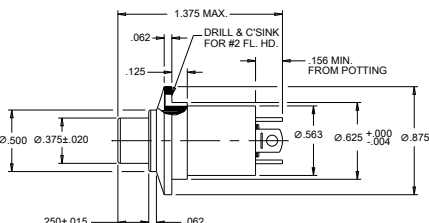
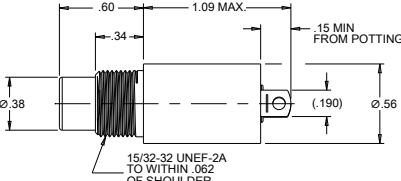
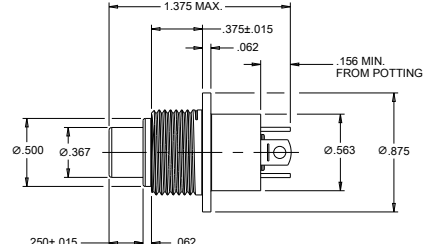
**Terminal Hardware:** Screws, lockwasher and solder lugs for screw terminal option

**Mounting Hardware:** Hex nut and lockwasher, panel seal on watertight switches

# PUSHBUTTONS PER MIL-PRF-8805/3 (MS25089)

**P1**  
MILITARY  
PUSHBUTTONS

MOMENTARY ACTION, LOW LEVEL UP TO 10 AMPS

|                                                                                                                                          |                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>P1-1 (MIL-A)</b></p>                              |  <p>1.375 MAX<br/>.062 .250<br/>156 MIN. FROM POTTING<br/>Ø.500 Ø.375±.015 Ø.562 Ø.623±.001<br/>.250±.015</p>                                         | <p><b>P1-7 (MIL-G)</b></p>                                                                                                                                                             |  <p>1.375 MAX<br/>.031 .312±.015<br/>156 MIN. FROM POTTING<br/>Ø.500 Ø.367 Ø.563 Ø.688<br/>.250 .187<br/>5/8-24 UNEF-2A TO WITHIN .062 OF SHOULDER</p> |
| <p><b>P1-2 (MIL-B)</b></p>                              |  <p>1.375 MAX<br/>R.062 .125 .125 .156<br/>Ø.739±.000 Ø.500 Ø.375 Ø.562 Ø.625±.000<br/>250 .062</p>                                                   | <p><b>P1-8 (MIL-H)</b></p>                                                                                                                                                             |  <p>1.375 MAX<br/>R.047 .438±.015<br/>156 MIN. FROM POTTING<br/>Ø.875 Ø.375 Ø.563<br/>.250±.015 .060<br/>5/8-24 UNEF-2A TO WITHIN .062 OF SHOULDER</p> |
| <p><b>P1-3 (MIL-C)</b><br/>Push-Pull Style Shown</p>  |  <p>1.50 MAX<br/>.062 .312<br/>156 MIN. FROM POTTING<br/>Ø.375 Ø.563<br/>.38 .187<br/>5/8-24 UNEF-2A TO WITHIN .062 OF SHOULDER<br/>#2-56 UNC-2B</p> | <p><b>Unsealed P1-90013</b><br/>Operating Force: 4.0 +/- 1.0 lb.<br/>Circuit: SPDT-DB<br/>Case: Black anodized aluminum<br/>Button: Black nylon</p>                                  |  <p>SR.750±.015 .40 .85 MAX.<br/>Ø.375 Ø.563<br/>.500-32 UNS-2A FULL THD'S TO WITHIN .062 OF SHOULDER<br/>#2-56 UNC-2B<br/>250</p>                   |
| <p><b>P1-5 (MIL-E)</b></p>                            |  <p>1.375 MAX.<br/>.062 DRILL &amp; C'SINK FOR #2 FL. HD. 156 MIN. FROM POTTING<br/>Ø.500 Ø.375±.020 Ø.563 Ø.625±.000 Ø.875<br/>.250±.015 .062</p>  | <p><b>Watertight P1-90024</b><br/><b>Dusttight P1-90014</b><br/>Operating Force: 4.0 +/- 1.0 lb.<br/>Circuit: SPST-N.O.<br/>Case: Black anodized aluminum<br/>Button: Red nylon</p>  |  <p>.60 1.09 MAX.<br/>15 MIN. FROM POTTING<br/>Ø.38 .34 (.190) Ø.56<br/>15/32-32 UNEF-2A TO WITHIN .062 OF SHOULDER</p>                              |
| <p><b>P1-6 (MIL-F)</b></p>                            |  <p>1.375 MAX.<br/>.375±.015 .062 156 MIN. FROM POTTING<br/>Ø.500 Ø.367 Ø.563 Ø.875<br/>.250±.015 .062</p>                                          |                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                           |

MOMENTARY ACTION, LOW LEVEL UP TO 10 AMPS

## P1 PART NUMBER CODE

| P1         | — | X |                     | X |  | X                       | *            |
|------------|---|---|---------------------|---|--|-------------------------|--------------|
| Case Style |   |   | Terminal Style      |   |  | Circuit Form            |              |
| 1. Style A |   |   | 1. Solder/Std.      |   |  | 1. N.O.                 |              |
| 2. Style B |   |   | 2. Screw/Std.       |   |  | 2. N.C.                 |              |
| 3. Style C |   |   | 3. Solder/Low Level |   |  | 3. N.C. 3 Terminal ①    |              |
| 5. Style E |   |   | 4. Screw/Low Level  |   |  | 4. N.O. 3 Terminal ①    |              |
| 6. Style F |   |   |                     |   |  | 5. 5 Terminal ①         |              |
| 7. Style G |   |   |                     |   |  | 6. 2 Circuit            |              |
| 8. Style H |   |   |                     |   |  |                         |              |
|            |   |   |                     |   |  | Switch Action           | Button Color |
|            |   |   |                     |   |  | 1. 2.5 lbs. Momentary   | 1. Red       |
|            |   |   |                     |   |  | 2. 4.0 lbs. Momentary ② | 2. Black     |
|            |   |   |                     |   |  | 3. Push-Pull            | 3. Orange    |
|            |   |   |                     |   |  |                         | 4. Yellow    |
|            |   |   |                     |   |  |                         | 5. Green     |
|            |   |   |                     |   |  |                         | 6. Blue      |
|            |   |   |                     |   |  |                         | 7. Purple    |
|            |   |   |                     |   |  |                         | 8. Gray      |
|            |   |   |                     |   |  |                         | 9. White     |

\* Add "W" for watertight to IP68S. (For watertight seal to MIL-PRF-8805 Design 3, please contact factory.)

① Circuit styles with 3 and 5 terminals have 50,000 cycle mechanical life per MIL-PRF-8805.

② Military standard is 4.0 lbs.

## ORDERING INFORMATION:

Select the OTTO P1 series switch to match your application requirements. Combinations of features are almost unlimited. When ordering, specify the Military (MS) Number and/or OTTO Part Number.

**Example:** P1-32629 is MS25089-3CW, "C" style case, 2 circuit contact configuration, 4.0 lbs. operating force, white button. For low level model, specify P1-34629, MS25089-3CWL. A partial cross reference list of Military (MS) Numbers to OTTO Part Numbers may be found in the back section of this catalog.

## EXAMPLES OF CUSTOMIZED P1 SERIES SEALED PUSHBUTTONS

### Special Cap On Press Fit Case

**Total Travel:** 0.085" +/- 0.015"  
**Operating Force:** 4.0 +/- 1.0 lb.  
**Reset Force:** 1.0 lb. min  
**Circuit:** SPDT 2 circuit  
**Mechanical Life:** 250,000 cycles  
**Button:** Black oxide #303 Stainless Steel  
**Housing:** Black anodized aluminum  
**P1-10047**



### Long Pushbutton

Dusttight per MIL-PRF-3805, this extra long button is installed in a Type P1 "C" case style.

**Total Travel:** 0.085" +/- 0.015"  
**Operating Force:** 4.0 lbs.  
**Circuit:** SPNO-DB  
**Rating:** 10 amps Resistive  
**Mechanical Life:** 250,000 cycles  
**Electrical Life:** 25,000 cycles  
**P1-30074**



### Special Push-Pull Switch

**Total Travel:** 0.085" +/- 0.015"  
**Operating Force:** 0.5 lb. to 2.0 lbs.  
**Circuit:** SPNO-DB  
**Mechanical Life:** 250,000 cycles  
**Button:** Black on white nylon  
**Housing:** Black anodized aluminum  
**Case:** Style "C"  
**P1-30052**



### Large Diameter Button

Button diameter is 1.187" and is red anodized aluminum mounted on a Type P1 style "C" body. Button is free to rotate 360°.

**Total Travel:** 0.085" +/- 0.015"  
**Operating Force:** 2.5, +0.5, -1.0 lb.  
**Circuit:** SPDT 2 circuit  
**Rating:** 10 amps Resistive  
**Mechanical Life:** 250,000 cycles  
**Electrical Life:** 25,000 cycles  
**P1-30075**



### Special Knurled Shroud

**Total Travel:** 0.085" +/- 0.015"  
**Operating Force:** 4.0 +/- 1.0 lb.  
**Rest Force:** 1.0 lb. min  
**Circuit:** SPDT 2 circuit  
**Mechanical Life:** 250,000 cycles  
**Button:** Red nylon  
**Housing:** Black anodized aluminum  
**P1-90108**



### Vandal Resistant

Stainless steel housing and button are watertight sealed. Ideal for unattended machines operated by the public.

**Operating Force:** 2.5, +1.0, -0.5 lb.  
**Circuit:** SPNO-DB  
**Mechanical Life:** 250,000 cycles  
**Bezel:** 1.5" dia.  
**Button:** 0.812" dia.  
**P1-90135-2**



For smaller 0.969" dia., DPDT-DB design, see P4-10155-2.

- Large buttons, up to 0.765" diameter
- Symbols & 9 colors of buttons
- Watertight to IP68S
- 10 amp resistive rating

NOTE: Refer to Standard Legends Chart in Appendix for available symbols.



P1-10142-X