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OUR MISSION

Control Products, Inc. designs and manufactures a broad line of quality thermal and waterproof switches and linear position sensors. We specialize in addressing specific switching problems and working with our customers to reach appropriate solutions in the shortest time frame possible. We recognize that constant attention to our customers’ needs is the key to our success. Our goal is to continue to grow by providing our customers the highest quality product and our employees, who are our greatest assets, the opportunity to reach their full potential.

CRITICAL TO THE ACHIEVEMENT OF OUR GOALS ARE THE FOLLOWING:

• A constant pursuit of excellence, to continually improve our service and products.
• To maintain the highest ethical standards when dealing with employees, customers, and suppliers.
• A commitment to R&D insuring the development of new products as well as constant improvements to our existing product line.
• To strive for defect free manufacturing, meeting or exceeding customer requirements.
• A sense of urgency when dealing with customer needs.

CONTROL PRODUCTS, INC.

Founded in 1946 by a corporation organized in 1871, Control Products, Inc. has pioneered the development of precision switches. CPI research engineers have attained the experience and have the facilities to handle unique problems in the field of totally sealed electrical switching.

All CPI switches are precision built of the highest quality material available. Our military-grade basic switches are sealed in neoprene rubber, which meets Mil. Spec. MS 39058, and our industrial switches are sealed in durable thermoplastic. Both are completely waterproof (totally submersible) thanks to the integrated wire terminations.

This brochure is designed to help you find the right waterproof or limit switch for your application. Custom configurations can be developed for specific installation. Control Products, Inc. is ready to serve you in all your waterproof and limit switch applications.

All CPI products are made in the U.S.A.
Introduction to CPI® Waterproof Switches

CPI’s Waterproof Switch system is developed around our basic snap-action waterproof switches. Using our basic switch as the starting point, we have designed a full range of switching products for hundreds of applications.

Small, flat, and lightweight, CPI Waterproof Switches are designed to perform under severe environmental conditions. They operate reliably under exposure to water, oil, humidity, sand, dirt, vibration, and shock. Both the switch and lead wires are encased in thermoplastic rubber (Santoprene) or neoprene (depending on the switch series) and will withstand temperatures from -65°F to 221°F. Designed originally for rugged military applications, CPI’s Waterproof Switches are extremely durable and versatile.

These basic switches are available in two grades: military and industrial. The military switches are encased in neoprene and meet or exceed all applicable government specifications. The industrial waterproof switches are encased in Santoprene. Both are available in a variety of configurations including 2 and 3 wire, 2 and 3 conductor cable and special terminations and coil cords. CPI also offers a full line of stainless steel and thermoplastic mounting brackets and actuators.

Our basic switches are available in three different button heights. This allows the design engineer to select the appropriate tactility for a particular application. For example, in an application requiring the use of work gloves, the choice might be to select the high button option to help the worker find the switch.

In addition, CPI Waterproof Switches are available with light touch actuation for reduced operator fatigue in manual operation and increased sensitivity in limit switch applications. For applications requiring up to 5 million operations, an extended life feature is available to meet your endurance requirements.

APPLICATIONS

CPI Waterproof Switches have been meeting the demand for long term reliable operation under extremely tough environmental conditions for a wide variety of military and industrial uses. For over 68 years, CPI switches have been specified as limit, safety, and control switches in applications such as the following:

• Construction machinery (off-road equipment, backhoes, cranes, booms).
• Farm equipment including harvester foragers, combines, and egg-handling machinery.
• Specialized equipment such as cherry pickers, aerial lifts, logging skidders, fire trucks, ladder trucks, and stairway lifts.
• Military combat equipment including tanks, personnel carriers, half-tracks, marine equipment, and aircraft.
• Conveyors, welding torches, paint sprayers, steam cleaners, street sweepers, industrial floor care equipment, washing equipment, and trash compactors.
• Pleasure boats, jet skis, personal watercraft, bilge pumps, underwater sleds, and marine battery chargers.
• Medical equipment including lasers, surgical microscopes, portable suction units, and foot switch controls.

Wherever there is an environmental challenge, CPI has a switch to take care of the job.

APPLICATION GUIDE

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>SWITCH SERIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Temperature (221°F)</td>
<td>K1 K5 B5 B7 B2 J41 J42 E1 D1</td>
</tr>
<tr>
<td>High Temperature (400°F)</td>
<td>X X X X X X X</td>
</tr>
<tr>
<td>Low Temperature (-50°F)</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Extended Life (5 MM cycles)</td>
<td>X X X X X X</td>
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<tr>
<td>Aviation Fuel Resistance</td>
<td>X X X X X X</td>
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<tr>
<td>Momentary Circuit</td>
<td>X X X X X X</td>
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<tr>
<td>Maintained Circuit</td>
<td>X X X X X X</td>
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<tr>
<td>Pendant Switch</td>
<td>X X X X X X</td>
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<tr>
<td>Panel Mount</td>
<td>X X X X X X</td>
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<tr>
<td>Limit Switch</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>Valve Position Switch</td>
<td>X X X X X X</td>
</tr>
</tbody>
</table>

1 J4 ball switch 2 J4 plunger switch

DESIGN FEATURES

The CPI snap-action waterproof switch represents a design unique among snap-action switches. Its most distinguishing feature is the sine blade spring which permits higher contact pressure, resulting in longer life and high current carrying capability.

The cutaway illustration shows the operation of the sine spring. Made of beryllium copper, the sine blade consists of a reversing helix, a lever, and a molecular hinge supporting the contact lever.

The sine spring is supported at both ends and mounted to pre-stress the blade. Individual calibration of each switch assures accuracy and repeatability. Permanent riveted mounting replaces V-grooves which can wear. The two mounting supports, combined with the contact and pressure point support on the blade, produce uniquely high vibration and sock resistance.

When actuated, the two halves of the blade reverse stress and cause an extremely fast snap at a precisely repeatable point.

![Design Features Diagram](image-url)
CPI® Industrial Waterproof Switches

GENERAL SPECIFICATIONS

Electrical Rating (28VDC / 120VAC): 5 amps resistive, 3 amps inductive. Higher ratings available on special order. UL recognized for 120VAC/5 amp resistive rating. Refer to Current/Endurance Chart on page 14 of this catalog.

Operating temperature range: -50°F to 221°F, depending on configuration.

Switch mechanism: Beryllium copper sine spring.

Environmental resistance: Excellent resistance to both high and low temperatures, acids, alkalis, salt spray, sand, dust, and fungus.

Color: Black is standard. Other colors available on special order.

Jacket material: Thermoplastic rubber.

Button Heights:

Extended life option: To meet the needs of applications with high endurance requirements, CPI engineers have developed extended life contact configurations capable of more than five million mechanical cycles. This design provides virtually unlimited endurance in low-current applications. Extended life switches can be coupled with most CPI limit switch brackets, providing you with a broad array of limit switch solutions.

Special contacts: Silver is the standard contact material. CPI also offers several different options to meet the characteristics of dry circuits (low voltage), long (60 day) idle periods and harsh loads, such as in-rush current and inductive arc. Special alloys, contact spacing, and precise sine blade calibration all contribute to meeting these requirements. Please contact CPI for details.

Special terminations: Special cables, wires, coil cords, and connectors available. See Special Terminations and Harnesses.

B5000 SERIES PART NUMBERS

<table>
<thead>
<tr>
<th>BUTTON HEIGHT</th>
<th>CONNECTION</th>
<th>ACTION</th>
<th>FIGURE (PAGE 6)</th>
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<tbody>
<tr>
<td>LOW (3/8&quot;)</td>
<td>MED. (7/16&quot;)</td>
<td>HIGH (1/2&quot;)</td>
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<tr>
<td>B5111</td>
<td>B5131</td>
<td>B5151</td>
<td>2-Wire (1)</td>
</tr>
<tr>
<td>B5112</td>
<td>B5132</td>
<td>B5152</td>
<td>2-Wire (1)</td>
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<td>B5113</td>
<td>B5133</td>
<td>B5153</td>
<td>3-Wire (1)</td>
</tr>
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<td>B5114</td>
<td>B5134</td>
<td>B5154</td>
<td>Cable (2)</td>
</tr>
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<td>B5115</td>
<td>B5135</td>
<td>B5155</td>
<td>Cable (2)</td>
</tr>
<tr>
<td>B5116</td>
<td>B5136</td>
<td>B5156</td>
<td>Cable (2)</td>
</tr>
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</table>

REFERENCES:

(1) 18 gauge, thermoplastic rubber insulation. Operating temperature: -50°F to 221°F

(2) PVC insulation, 18 gauge wire, SJT. 300V, 60°C, 7 Amp. External strain relief may be required.
B7000 Light Touch Switches: The B7000 series are special light touch switches that offer reduced operation force for applications requiring repetitive manual operation and increased sensitivity for limit switch applications. Normal switch actuation pressures range from 2.5 lbs. to 3.5 lbs. maximum. Light touch switches have a maximum actuation pressure of 1/8 lbs. depending on button height.

<table>
<thead>
<tr>
<th>Actuating and Release Forces (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Button - 0.4 Min. Release</td>
</tr>
<tr>
<td>1.1 Max. Actuate</td>
</tr>
<tr>
<td>Med Button - 0.5 Min. Release</td>
</tr>
<tr>
<td>1.3 Max. Actuate</td>
</tr>
<tr>
<td>High Button - 0.5 Min. Release</td>
</tr>
<tr>
<td>1.8 Max. Actuate</td>
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</table>

<table>
<thead>
<tr>
<th>B7000 LIGHT TOUCH SERIES PART NUMBERS</th>
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<tbody>
<tr>
<td><strong>BUTTON HEIGHT</strong></td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>LOW (3/8&quot;)</td>
</tr>
<tr>
<td>B7111</td>
</tr>
<tr>
<td>B7112</td>
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<td>B7115</td>
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<td>B7116</td>
</tr>
</tbody>
</table>

REFERENCES:
1. 18 gauge, thermoplastic rubber insulation. Operating temperature: -50°F to 221°F
2. PVC insulation, 18 gauge wire, SJT. 300V, 60ºC, 7 Amp. External strain relief may be required.

MAINTAINED CONTACT SWITCHES

K5000 Series Switches: Industrial grade waterproof switches are now available in two position maintained circuits, SPST and SPDT. The oval actuator platform allows for installation behind panels and provides a panel seal. Two-position momentary circuits are also available for panel uniformity where side-by-side maintained and momentary control are needed.

General specifications, including contact ratings, are the same as the B5000/B7000 Series.

BUTTON LEGENDS:
Standard legend is "ON" - "OFF". Custom legends available, up to 3 characters per button.

SWITCH BODY DIMENSIONS:

K5000 Series Switches:
Industrial grade waterproof switches are now available in two position maintained circuits, SPST and SPDT. The oval actuator platform allows for installation behind panels and provides a panel seal. Two-position momentary circuits are also available for panel uniformity where side-by-side maintained and momentary control are needed.

General specifications, including contact ratings, are the same as the B5000/B7000 Series.

BUTTON LEGENDS:
Standard legend is "ON" - "OFF". Custom legends available, up to 3 characters per button.
K5000 SERIES PART NUMBERS

<table>
<thead>
<tr>
<th>PART NUMBERS</th>
<th>CONNECTION</th>
<th>ACTION</th>
<th>FIGURE</th>
</tr>
</thead>
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<tr>
<td>K5111</td>
<td>2-Wire (1)</td>
<td>ON/OFF</td>
<td>1</td>
</tr>
<tr>
<td>K5113</td>
<td>2-Wire (1)</td>
<td>SPDT</td>
<td>1</td>
</tr>
<tr>
<td>K5114</td>
<td>Cable (2)</td>
<td>ON/OFF</td>
<td>3</td>
</tr>
<tr>
<td>K5116</td>
<td>Cable (2)</td>
<td>SPDT</td>
<td>3</td>
</tr>
</tbody>
</table>

REFERENCES:

1. 18 gauge, thermoplastic rubber insulation. Operating temperature: -50°F to 221°F
2. PVC insulation, 18 gauge wire, SJT. 300V, 60°C, 7 Amp. External strain relief may be required.

PANEL MOUNTING:

NOTES:
1. Waterproof switch will seal the panel when mounted as shown.
2. Panels thicker than 3/32" will cause the actuating button to be recessed below the mounting surface.
3. Two switches are shown mounted in E1333 and E1058 brackets, but any number can be mounted in various patterns. Please contact us for more panel bracket designs / configurations.

ORDERING INFORMATION:
The complete ordering information for a CPI industrial waterproof switch is illustrated below. The first series of characters indicates the switch and the last number indicates the lead length in inches. The example here designates switch B5111 (low button, 2 wire, NO) with 12" leads. Dashes are used to separate the different components of the part number.

- SWITCH
- LEAD LENGTH
- TERMINATIONS

| B5111 | —12 | Wire terminations are standard. See Special Terminations and Harnesses, page 19 |
**Actuating and Release Forces (lbs.)**

- Low Button: 0.4 Min. Release  
- High Button: 0.5 Min. Release  
- 1.1 Max. Actuate  
- 1.8 Max. Actuate

**Light Touch Switches:** The B2000 Series are available as special light touch switches that offer less operator fatigue in applications requiring repetitive manual operation and increased sensitivity for limit switch applications. Normal switch actuation pressures range from 2.5 lbs. to 3.5 lbs. maximum. Light touch switches have a maximum actuation pressure of 1.8 lbs. depending on button height. Contact CPI for details.

**Underwater operations:** Standard CPI Waterproof Switches will be operated by the pressure of approximately 15 ft. of water.

**Extended life option:** To meet the needs of applications with high endurance requirements, CPI engineers have developed extended-life contact configurations capable of more than five million mechanical cycles. This design provides virtually unlimited endurance in low current applications. Extended life switches can be coupled with most CPI limit switch brackets, providing you with a broad array of limit switch solutions.

**Special contacts:** Silver is the standard contact material. CPI also offers several different options to meet the characteristics of dry circuits (low voltage), long (60 day) idle periods and harsh loads, such as in-rush current and inductive arc. Special alloys, contact spacing, and precise sine blade calibration all contribute to meeting these requirements. Please contact CPI for details.

**Special terminations:** Special cables, wires, coil cords, and connectors available. See Special Termination and Harnesses, page 19.
### CPI® Military Grade Waterproof Switches

#### SWITCH BODY DIMENSIONS

- **K1007**
- **K1008 V-BACK**

- **K1005**
- **K1006 V-BACK**

#### SWITCH BODY DIMENSIONS

- **B2004**
- **B2005**

- **B2030**

**MILITARY SPECIFICATIONS**

<table>
<thead>
<tr>
<th>CPI PART NUMBER</th>
<th>ORDANCE NUMBER</th>
<th>ACTION</th>
<th>LEAD LENGTHS</th>
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<td>A2007-6</td>
<td>7389132</td>
<td>N.O.</td>
<td>6-1/4</td>
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<td>A2007-31</td>
<td>MS-39058-1</td>
<td>N.O.</td>
<td>31</td>
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<tr>
<td>A2008-12</td>
<td>MS-39058-2</td>
<td>N.C.</td>
<td>12-3/16</td>
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<tr>
<td>A2009-12</td>
<td>MS-39058-3</td>
<td>S.P.D.T.</td>
<td>12-3/16</td>
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**Control Products, Inc.** 280 Ridgedale Ave. East Hanover, NJ 07936-2394  (973) 887-9400  www.cpi-nj.com
### CPI® Military Grade Waterproof Switches

#### B2000 SERIES PART NUMBERS

<table>
<thead>
<tr>
<th>BUTTON HEIGHT</th>
<th>CONNECTION</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW (3/8&quot;)</td>
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<td></td>
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<tr>
<td>HIGH (1/2&quot;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2002</td>
<td>B2030</td>
<td>2-Wire (1)</td>
</tr>
<tr>
<td>B2003</td>
<td>B2031</td>
<td>2-Wire (1)</td>
</tr>
<tr>
<td>B2004</td>
<td>B2032</td>
<td>3-Wire (1)</td>
</tr>
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<td>B2005</td>
<td>B2046</td>
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<td>B2006</td>
<td>B2047</td>
<td>Cable (2)</td>
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<tr>
<td>B2007</td>
<td>B2048</td>
<td>Cable (3)</td>
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</tbody>
</table>

### REFERENCES

1. 16 gauge neoprene insulation (0.130" OD)
2. 18 gauge neoprene insulation (0.235" OD)
3. 20 gauge neoprene insulation (0.255" OD)

### K1000 SERIES PART NUMBERS

<table>
<thead>
<tr>
<th>PART NUMBERS</th>
<th>STANDARD LEAD LENGTH</th>
<th>CONNECTION</th>
<th>ACTION</th>
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<tr>
<td>K1005</td>
<td>18&quot;</td>
<td>2-Wire (1)</td>
<td>On / Off</td>
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<tr>
<td>K1007</td>
<td>18&quot;</td>
<td>Cable (2)</td>
<td>On / Off</td>
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<td>K1006</td>
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<tr>
<td>K1008</td>
<td>18&quot;</td>
<td>Cable (2)</td>
<td>NO / Lever</td>
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<td>K1009</td>
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<td>2-Wire (1)</td>
<td>NC / Lever</td>
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<td>K1012</td>
<td>18&quot;</td>
<td>Cable (2)</td>
<td>NC / Lever</td>
</tr>
</tbody>
</table>

### REFERENCES

1. 16 gauge neoprene insulation (0.130" OD)
2. 18 gauge neoprene insulation (0.235" OD)

### ORDERING INFORMATION:

The complete ordering information for a CPI military grade is illustrated below. The first series of characters indicates the switch and the last number indicates the lead length in inches. The example here designates switch B2002 (low button, 2-wire, NO), with 12" leads. Dashes are used to separate the different components of the part number.
When you combine one of CPI’s industrial or military grade switches with a CPI mounting bracket and actuator, the result is a limit switch that you can customize for your particular application.

Basically, there are three methods for actuation: lever, lever/roller, and manual. The information that follows presents our standard brackets by the type of actuation desired. Within each category, there are different configurations for surface, recessed, and angle mounting, as well as designs for one or two button switches.

CPI can also custom design mounting brackets for non-standard applications. Some of these are shown under the designation “Special Brackets” in the information that follows.

All brackets are fabricated from 302 or 304 stainless steel. Springs are made of 17-7ph stainless steel.

**DIMENSIONAL TERMINOLOGY & CONVENTIONS**

- **Free Height**: the dimension of the actuating spring in its natural position relative to a location or surface.

  - **from mounting surface / bottom**
  - **from top of bracket**

- **Wire / Cable Direction**: leads exit the brackets at the opening furthest from the switch button area. Please note the direction of the actuating spring as it may be facing towards or away from the leads.

- **Mounting Holes / Slots**: Unless otherwise noted, mounting holes and slots are .22" diameter / wide.

  - Direction of longitudinal actuation
SURFACE MOUNT SWITCHES
The following are used with low button momentary switches

**E1094**
.755” spring free height from mounting surface

**E1078**
.69” spring free height from mounting surface

**E1127**
1.17” spring free height from mounting surface

**E1046**
.71” spring free height from mounting surface

**E1115**
1.17” spring free height from mounting surface

**E1085**
.94” spring free height from mounting surface
E1096
.98" spring free height from mounting surface

E1134
.95" spring free height from mounting surface

E1283
1.27" spring free height from mounting surface

E1031
1.17" spring free height from mounting surface

Delrin roller
.14" diameter

E1112
.81" spring free height from mounting surface

E1092
.99"max
.50" height adjustment

E1310
1.188" spring free height from bottom

E1303
.16" diameter

ANGLE MOUNT SWITCHES
The following are used with low button momentary switches
E1161  
.81” spring free height from bracket top surface

E1117

.50” height adjustment

E1129  
.70” spring free height from top of bracket

E1100  
.47” spring free height from top of bracket

E1101

.99” max.

E1118  
.36” spring free height from top of bracket

E1117

1.42”  
1.00”  
1.75”

E1129

1.42”  
1.00”  
1.75”

E1120

1.42”  
1.00”  
1.75”

E1101

2x 25-20UNC PEM nut

1.00”

1.75”

2.56”

.99”

.99”

0.99” MAX

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MANUAL ACTUATION SWITCHES

The following may be used with any height button switch.

E1055

E1057

For use with 2-wire switches only.
Designed for K1005, but can be used also with Industrial Grade momentary switches.

ORDERING INFORMATION:
The complete ordering information for E1 limit switches is illustrated below. The first series of characters indicates the E1 bracket followed by the momentary switch and the last number indicates the lead length in inches. The example here designates an E1902 angle bracket, switch (low button, 2 wire, NO) with 12" leads. Dashes are used to separate the different components of the part number.
Since there are some many factors which can affect the switch life in any application, we firmly believe in testing for specific endurance requirements when possible. We offer no-charge testing services, using your load and/or actuator. Over the years, we have accumulated data, some of which is tabulated below.

Please note that these figures are based on our standard contacts, without extended life calibration or high current carrying contacts. The endurances cited below should be used as a guide only and do not imply any warranty. If you are looking for endurances higher than what is specified below, or a load which is not listed, please call CPI. Our extended life and high current carrying contact features will likely meet your needs.

### ENDURANCE RATINGS (X 1,000 CYCLES)

<table>
<thead>
<tr>
<th>LOAD</th>
<th>CURRENT</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>2A</td>
</tr>
<tr>
<td>12VDC</td>
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<tr>
<td>Resistive</td>
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<tr>
<td>Lamp</td>
<td>75</td>
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<tr>
<td>Inductive</td>
<td>50</td>
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<tr>
<td>Motor</td>
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<td>28VDC</td>
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<tr>
<td>Resistive</td>
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<td>Lamp</td>
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<td>Inductive</td>
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<tr>
<td>Motor</td>
<td>10</td>
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<td>120VAC</td>
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<td>Lamp</td>
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<td>Lamp</td>
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<tr>
<td>Motor</td>
<td>10</td>
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</tbody>
</table>

1CPI high current carrying contacts and extended life (five million cycles) features not used to achieve above test results.

*Test data not available at time of publication. Please contact CPI to discuss your application.
CPI's J4 ball switches utilize a patented "ball carrier" design which protects the operation of the switch under highly adverse conditions. The J4's patented ball carrier design incorporates an exclusion seal which prevents contaminants from jamming the ball even when it is depressed.

These were originally designed for demanding military vehicle applications such as cab latch and neutral safety indication, both under-body installations presenting the harshest environment. They're ideal for heavy industrial equipment applications, completely submersible and unaffected by water, salt spray, humidity, dirt, dust, sand, icing, oil, shock and vibration.

All of our ball switches come with pre-integrated and sealed leads in specifiable lengths, and can be ordered in normally open/closed configurations.

**GENERAL SPECIFICATIONS:**
- **Electrical Rating:** 5 amps @ 28VDC
- **Endurance:** 100,000 electromechanical cycles at full-rated load. Extended endurance is available for specific applications.
- **Temperature resistance:** -50°F to 205°F (up to 302°F available)
- **Travel parameters:**
  - Pre-travel: .004" min., .032" max.
  - Over-travel: to top of bushing
- **Material:** plated steel, brass, or stainless steel
- **Standard wire:** 16 AWG, GXL insulation
- **Circuit:** SPST momentary, NO and NC available.

**ORDERING INFORMATION:**
The complete ordering information for a J series limit switch is illustrated below. The first series of characters indicates the switch and the last number indicates the lead length in inches. The example here designates switch J4001, with 12" leads. Dashes are used to separate the different components of the part number.

```
<table>
<thead>
<tr>
<th>SWITCH</th>
<th>LEAD LENGTH</th>
<th>TERMINATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>J4001</td>
<td>12</td>
<td>Wire terminations are standard. See Special Terminations and Harnesses, page 19</td>
</tr>
<tr>
<td>J4002</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>J4301</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>J4302</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>J4201</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>J4202</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>
```

**SWITCH LEAD LENGTH TERMINATIONS**
- **J4001:** NO
- **J4002:** NC
- **J4301:** NO
- **J4302:** NC
- **J4201:** NO
- **J4202:** NC
High-Pressure / High-Temperature Designs

Our high-performance plunger switches use the same patented ball carrier design of the J4 ball switch, adding enhanced actuator capabilities, including additional overtravel, hardened plungers, and higher temperature capability to 400°F. Available with normally open or normally closed contacts, these ultra-rugged plunger switches can be found in the harshest environments, including diesel generators, cooking ovens, under military vehicles, various marine and amphibious applications.

J4 Plunger Switches are ideal for the harshest heavy industrial equipment applications. They are completely submersible and are unaffected by water, salt spray, humidity, dirt, dust, sand, icing, oil, shock and vibration, temperature extremes or power washing operations.

GENERAL SPECIFICATIONS:

Electrical Rating: 5 amps @ 28VDC
Endurance: 100,000 electromechanical cycles at full-rated load. Other electromechanical ratings available - please consult the factory.
Temperature resistance: -50°F to 400°F
Pressure Rating: up to 50 psi (actuator withstanding)
Travel parameters:
  - Pre-travel: .004” min., .032” max.
  - Over-travel: varies by model
Material: stainless steel
Standard wire: 16 AWG, GXL insulation
Circuit: SPST momentary, NO and NC available.

High-temperature Ball Actuator operation temperature to 400°F

Our high-temperature and high-pressure designs can be customized to your specifications.

Please contact the factory to discuss your application and for further information on this product.
Control Products, Inc. offers pushbutton actuator brackets for panel mounting our industrial or military grade momentary switches for marine, medical, food processing, off-road, and other applications where these types of switches are desired. Except as noted, these actuator brackets can accommodate any basic CPI low-button industrial or military switch as described in the first part of this catalog. Brackets are either stainless steel or stainless steel / thermoplastic.

D1021

bushing diameter is .47

D1022

bushing diameter is .47

D1040

Mounting Hardware and Optional Protective Boot

Optional protective boots to ensure complete panel sealing are available in red, black or gray. Mounting nuts come standard with each switch.
These brackets enable the user to mount many of our waterproof switches to a variety of handles or pipes. Black nylon cable ties provide easy assembly and removal for a wide range of installations such as welding torch handles, equipment railings, control levers and piping assemblies. This gives operators precise control where they need it. Our two-button maintained on/off and raised button momentary switches are particularly suited for such applications.

Cable ties can accommodate up to 2.625" (66.68 mm) tube diameter

NOTE:
V-Back switches K1006, K1008, K1009, and K1032 have grooves on the switch body for O-ring mounting on handles and pipes (See page XX).

ORDERING INFORMATION:
HS001 can be ordered with our K1005 or K1007 two-button switches.

HS002 can be ordered with any of our military-grade switches except for raised button cable switches. Industrial switches can be used in all button heights in 2 and 3 wire configurations.

HS brackets are shipped unassembled.
Special Terminations and Harnesses

Along with CPI’s standard offering of individual wire leads and two and three conductor cable, CPI also has available special terminations to meet your specifications. Possible variations in the wire itself include special color-coded wire, SAE J1128 certified wire, BUNA-N coil cord and alternative wire gauges. Connectors, wire markers and sleeving may also be specified, creating a complete switch/harness assembly.

The main advantage is that you will receive a complete assembly from CPI - no need to purchase many individual parts, or reship parts to a third party harness house. In addition, you will receive the highest quality possible, as CPI is your most qualified source when it comes to integrating terminations with our sealed switches.

We have experience with the connectors of many major manufacturers including AMP, Deutsch, Packard, Bendix, Amphenol, Molex, Thomas & Betts, Cinch, Methode and Cannon to name a few. If you have a drawing or if you require assistance in creating an installation-ready switch assembly, please contact CPI.

Because of their popularity, we have created a standard part number ordering system for the Packard Weatherpak series of connectors. The designation “C” for a female connector or “CM” for a male connector is added to the lead length number. The following are examples of how the designations are used for adding Weatherpak connectors to a CPI switch.

**Part Number Configuration Example:**

<table>
<thead>
<tr>
<th>BRACKET</th>
<th>SWITCH</th>
<th>LEAD LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1092</td>
<td>B5113</td>
<td>12C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(12” lead with female connector)</td>
</tr>
<tr>
<td>C1005</td>
<td>B7111</td>
<td>48CM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(48” lead with male connector)</td>
</tr>
</tbody>
</table>

Two and three way towers and shrouds are available using the “C” and “CM” designation.

**PACKARD CROSS REFERENCE TABLE**

<table>
<thead>
<tr>
<th>CPI SWITCH SERIES / DESCRIPTION</th>
<th>PACKARD SHELL USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2000/Two wire, “C” designation</td>
<td>12010973</td>
</tr>
<tr>
<td>B2000/Two wire, “CM” designation</td>
<td>12015792</td>
</tr>
<tr>
<td>B2000/Three wire, “C” designation</td>
<td>12010712</td>
</tr>
<tr>
<td>B2000/Three wire, “CM” designation</td>
<td>12015793</td>
</tr>
<tr>
<td>B5000, B7000/Two wire, “C” designation</td>
<td>12010973</td>
</tr>
<tr>
<td>B5000, B7000/Two wire, “CM” designation</td>
<td>12015792</td>
</tr>
<tr>
<td>B5000, B7000/Three wire, “C” designation</td>
<td>12010712</td>
</tr>
<tr>
<td>B5000, B7000/Three wire, “CM” designation</td>
<td>12015793</td>
</tr>
<tr>
<td>J4, “C” designation</td>
<td>12010973</td>
</tr>
<tr>
<td>J4, “CM” designation</td>
<td>12015792</td>
</tr>
</tbody>
</table>

Next Page:
Shown here are a few examples of the harnesses we have supplied to manufacturers of high quality equipment.
CPI has been designing and evolving electro-mechanical thermal switch products since it built its first thermal limit switches for the military in 1946. Our off-the-shelf products are complemented by a design team that develops custom switches for OEM’s across the country providing deep expertise, and full documentation and testing of your custom thermal switch solution. All CPI switch products are designed and built in the USA.

The thermal switches offered by Control Products, like our freeze switch and thermostat switch, are suitable for industrial, military, and other applications that require the utmost in reliable electromechanical control and safety performance. They can perform to tight tolerances and programmable set points up to 1750°F.

CPI engineers a complete line of hydraulic cylinder linear position sensors all designed for reliable, continuous operation in hydraulic systems, as well as harsh duty environments offering immunity to extreme temperatures, high vibration, salt water, salt spray, and submersion in sea water at extreme depths. These are environments where draw wire sensors have never been successfully deployed. In the case of hydraulic cylinder and accumulator position sensing applications, CPI linear position sensors represent a welcome alternative to long, rod-type sensors, particularly in accumulators and long stroke applications.

Subsea / Oil & Gas Applications
Our SL2000 Models are designed especially for the needs of the Oil & Gas Industry, the CPI sensor provides one uniform solution to position measurement both on the drilling platform and at the well head. Systems such as Blow-Out Preventers, or Heave Compensation Systems that use hydraulic cylinders or accumulators will find the CPI SL2000 the perfect solution to reliability and durability concerns both above and below the surface. Magnetostrictive core sensors are available in intrinsically safe, as well as explosion proof variations, with various ATEX, SIL, and IECEX ratings for virtually any hazardous environment.