

CPI Waterproof Switches



	PAGE
INTRODUCTION	2
APPLICATIONS	2
INDUSTRIAL WATERPROOF SWITCHES – B5, B7, AND K5 SERIES	3
MILITARY GRADE WATERPROOF SWITCHES – A2, B2, AND K1 SERIES	7
LIMIT SWITCHES – E SERIES	9
SWITCH ENDURANCE - ELECTRICAL LOADS	14
BALL / PLUNGER SWITCHES – J4 SERIES	15
PANEL PLUNGER SWITCHES – D1 SERIES	17
HANDLE / PIPE SWITCH BRACKETS	18
SPECIAL TERMINATIONS / HARNESSSES	19

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.

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

CRITERIA	SWITCH SERIES									
	K1	K5	B5	B7	B2	J4 ¹	J4 ²	E1	D1	
High Temperature (221F)		X	X	X		X	X	X		
High Temperature (400F)							X			
Low Temperature (-50F)	X				X				X	X
Extended Life (5 MM cycles)			X	X	X				X	X
Aviation Fuel Resistance					X				X	
Momentary Circuit	X		X	X	X	X	X	X	X	X
Maintained Circuit	X	X								
Pendant Switch	X	X	X	X	X					
Panel Mount			X	X	X					X
Limit Switch						X	X	X		
Valve Position Switch						X	X			

¹ J4 ball switch ² J4 plunger switch

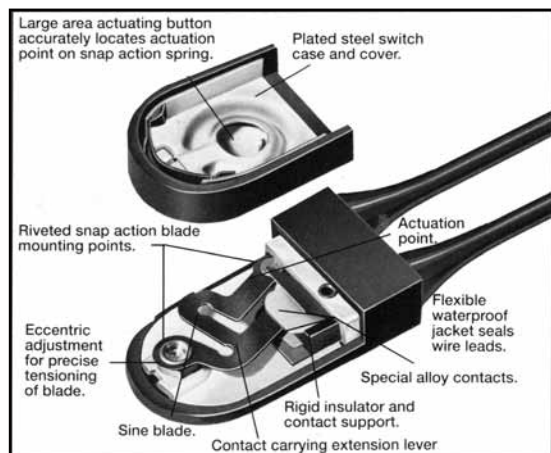
DESIGN FEATURES

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 shock resistance.

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





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.

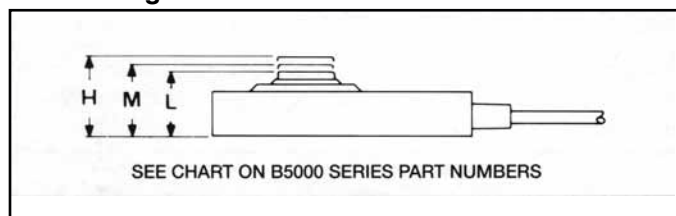
Switch mechanism: Beryllium copper sine spring.

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.

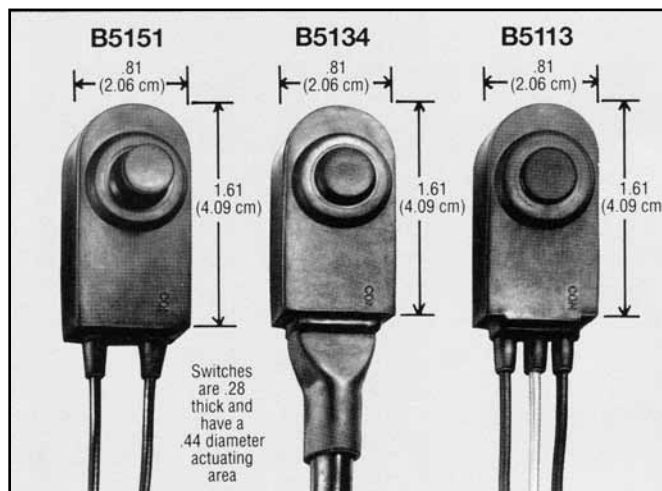
Button Heights:



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

BUTTON HEIGHT			CONNECTION	ACTION	FIGURE (PAGE 6)
LOW (3/8")	MED. (7/16")	HIGH (1/2")			
B5111	B5131	B5151	2-Wire (1)	NO	1
B5112	B5132	B5152	2-Wire (1)	NC	1
B5113	B5133	B5153	3-Wire (1)	SPDT	2
B5114	B5134	B5154	Cable (2)	NO	3
B5115	B5135	B5155	Cable (2)	NC	3
B5116	B5136	B5156	Cable (2)	SPDT	3

REFERENCES:

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

Actuating and Release Forces (lbs.)

Low Button - 0.4 Min. Release
 1.1 Max. Actuate

Med Button - 0.5 Min. Release
 1.3 Max. Actuate

High Button - 0.5 Min. Release
 1.8 Max. Actuate

B7000 LIGHT TOUCH SERIES PART NUMBERS

BUTTON HEIGHT			CONNECTION	ACTION	FIGURE (PAGE 6)
LOW (3/8")	MED. (7/16")	HIGH (1/2")			
B7111	B7131	B7151	2-Wire (1)	NO	1
B7112	B7132	B7152	2-Wire (1)	NC	1
B7113	B7133	B7153	3-Wire (1)	SPDT	2
B7114	B7134	B7154	Cable (2)	NO	3
B7115	B7135	B7155	Cable (2)	NC	3
B7116	B7136	B7156	Cable (2)	SPDT	3

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.

MAINTAINED CONTACT SWITCHES



K5000 Series Switches:

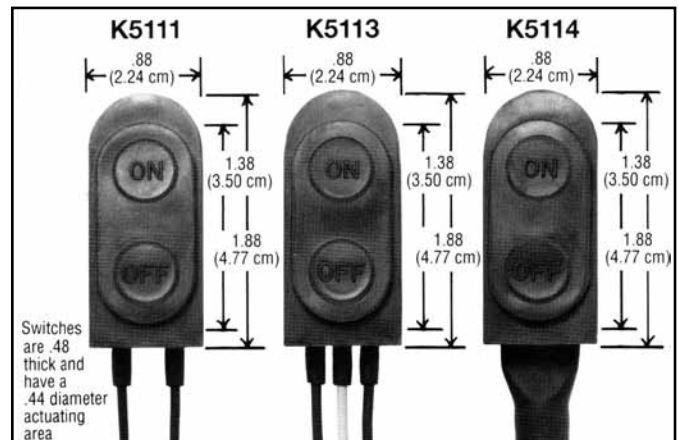
Industrial grade waterproof switches are now available in two position maintained circuits, SPST and SPDT. The oval actuator platform allows for installation behind panels and provides a panel seal. Two-position momentary circuits are also available for panel uniformity where side-by-side maintained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



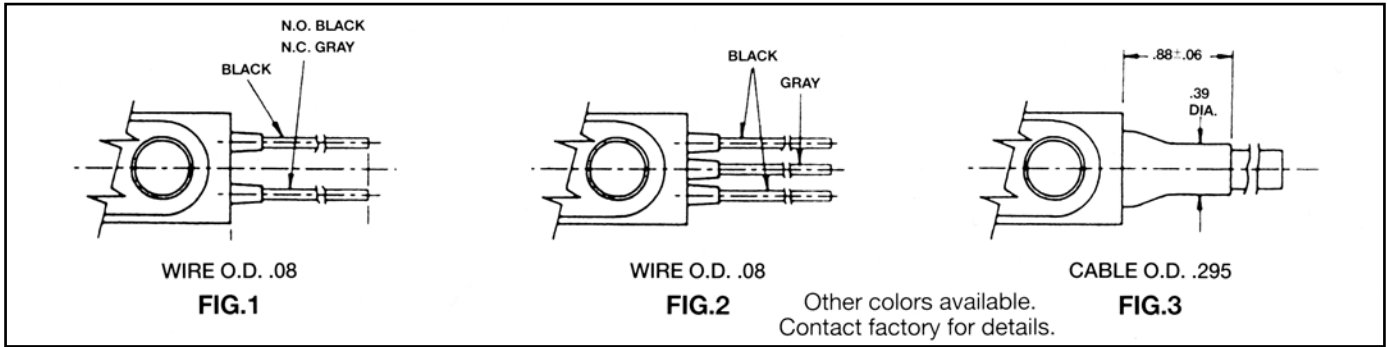
CPI® Industrial Waterproof Switches

K5000 SERIES PART NUMBERS

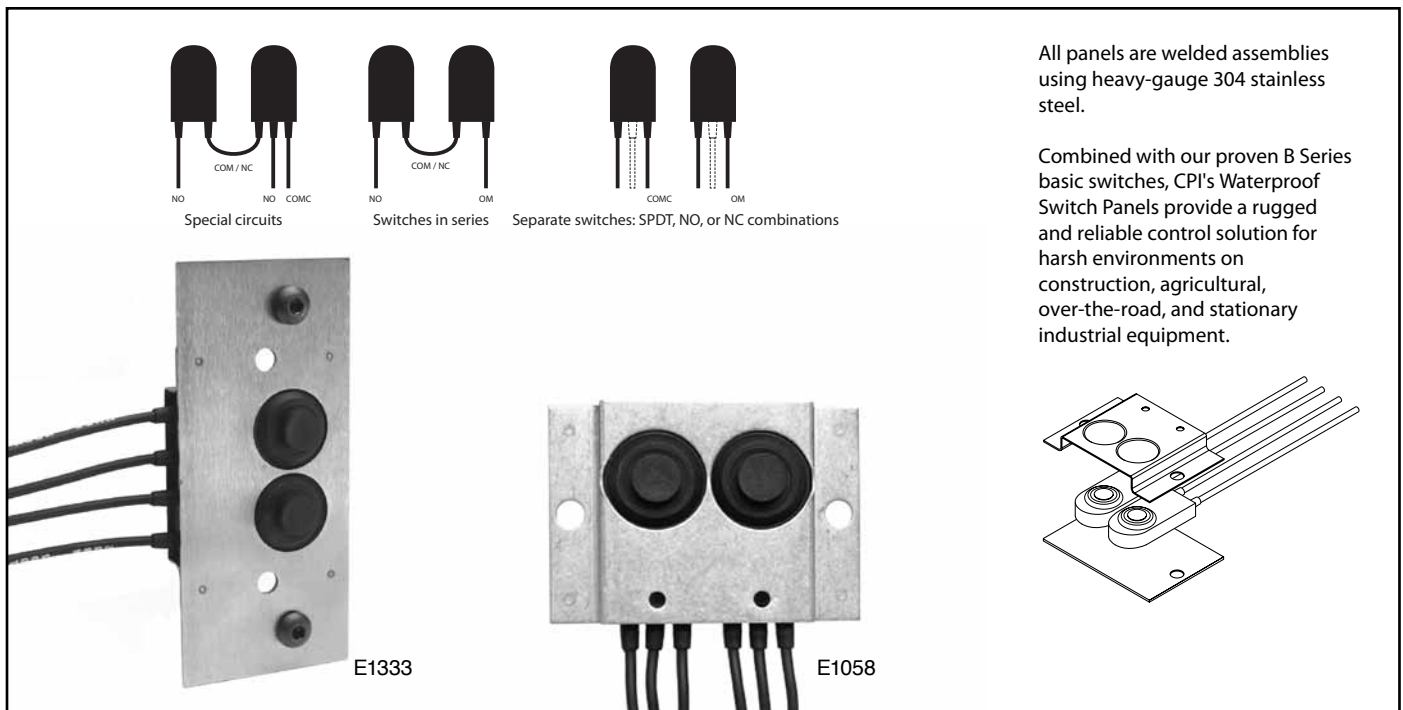
PART NUMBERS	CONNECTION	ACTION	FIGURE
K5111	2-Wire (1)	ON/OFF	1
K5113	2-Wire (1)	SPDT	1
K5114	Cable (2)	ON/OFF	3
K5116	Cable (2)	SPDT	3

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:

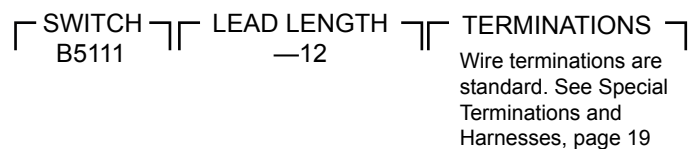


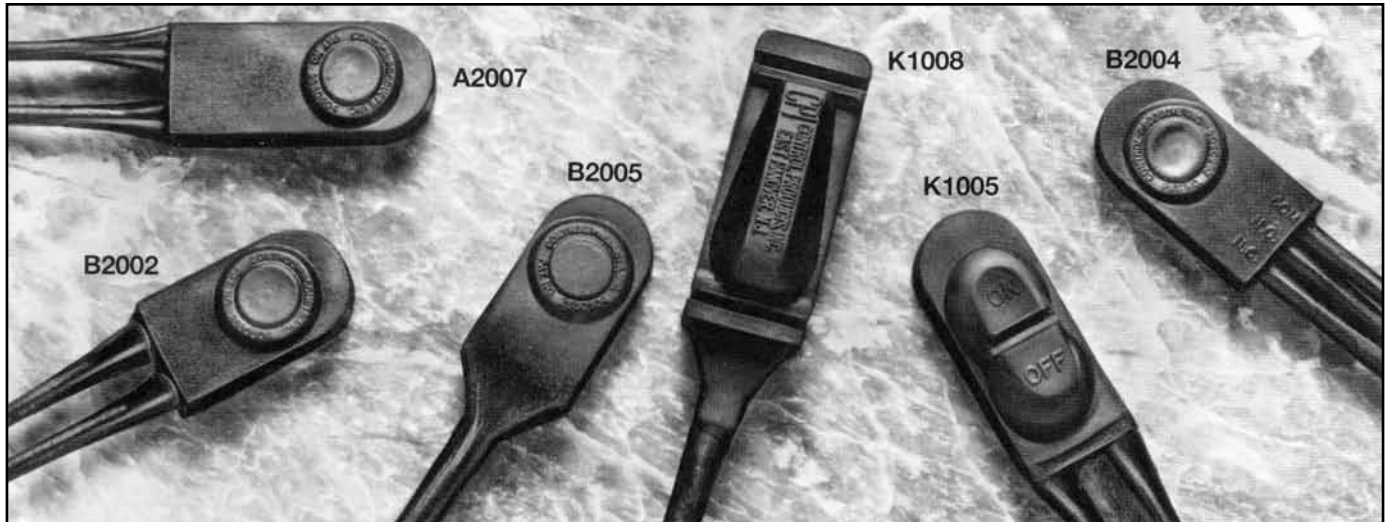
NOTES:

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.





GENERAL SPECIFICATIONS:

Electrical rating:

- 28 VDC:** 15 Amps resistive, 7.5 Amps inductive and 7.5 Amps lamp. 50,000 cycles
- 120 VAC:** 5 Amps resistive, 2 Amps inductive and 2 Amps lamp. 100,000 cycles.

Other ratings available on special order.

Refer to Current/Endurance Chart on page 14

Switches are UL recognized for 120VAC / 5A electrical rating.

Operating temperature ranges: -65°F to 165°F

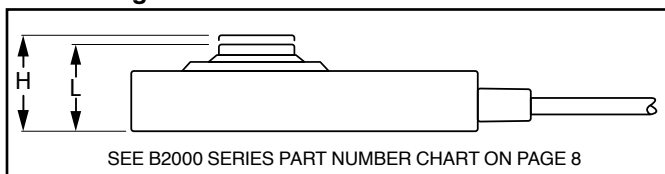
Switch mechanism: Beryllium copper sine spring.

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: Neoprene is standard. Buna N available for special chemical resistance requirements such as aviation fuel.

Button heights:



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.

Actuating and Release Forces (lbs.)

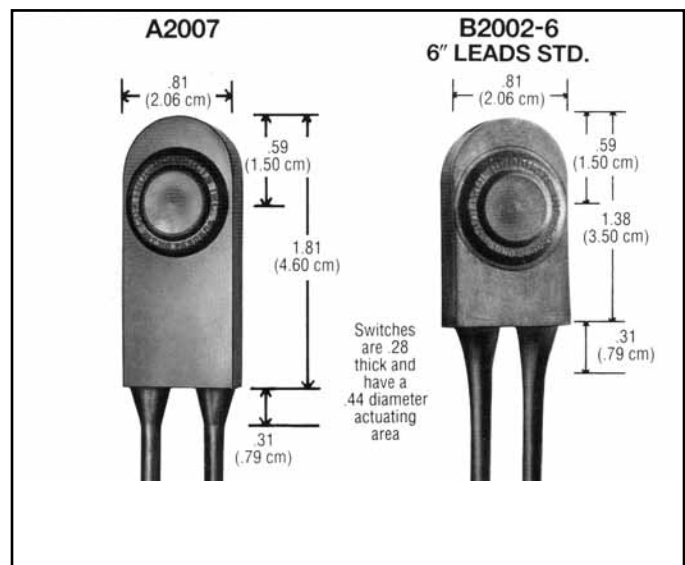
- Low Button - 0.4 Min. Release
1.1 Max. Actuate
- High Button - 0.5 Min. Release
1.8 Max. Actuate

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

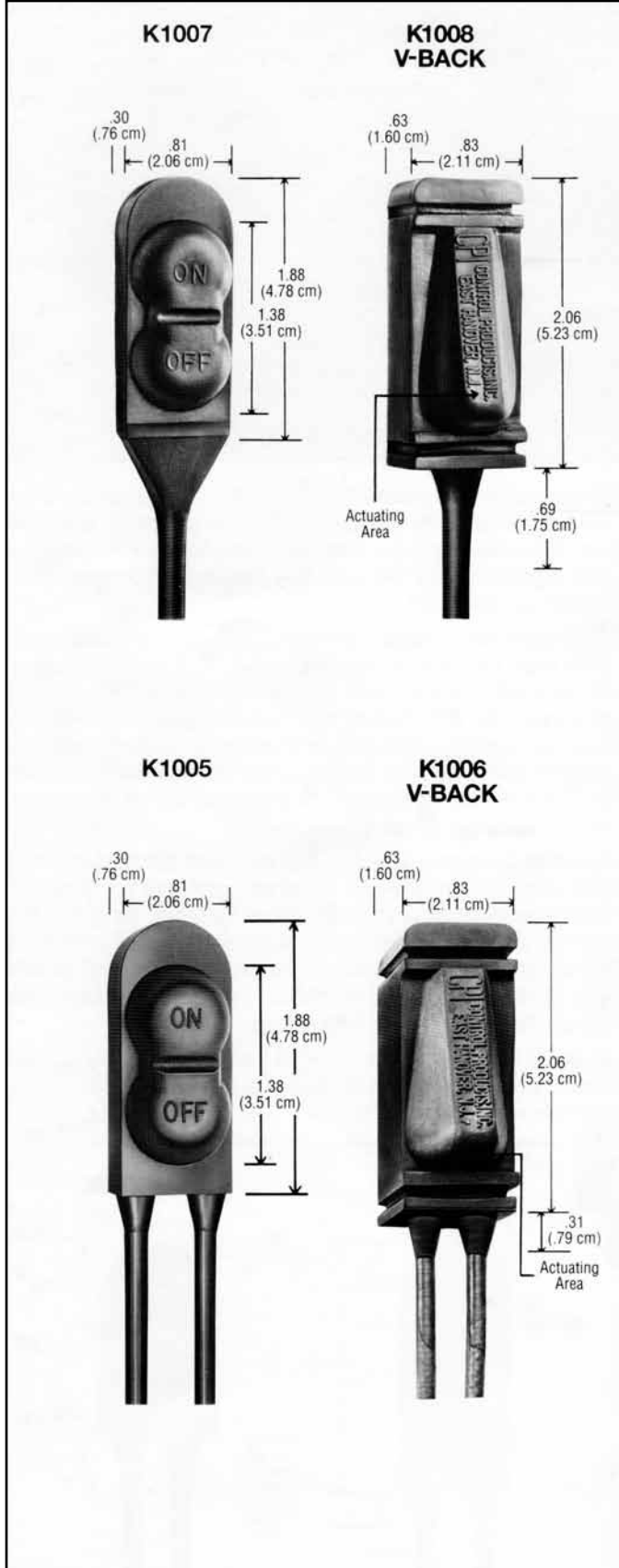
Extended life option: To meet the needs of applications with high endurance requirements, CPI engineers have developed extended-life contact configurations capable of more than five million mechanical cycles. This design provides virtually unlimited endurance in low current applications. Extended life 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.

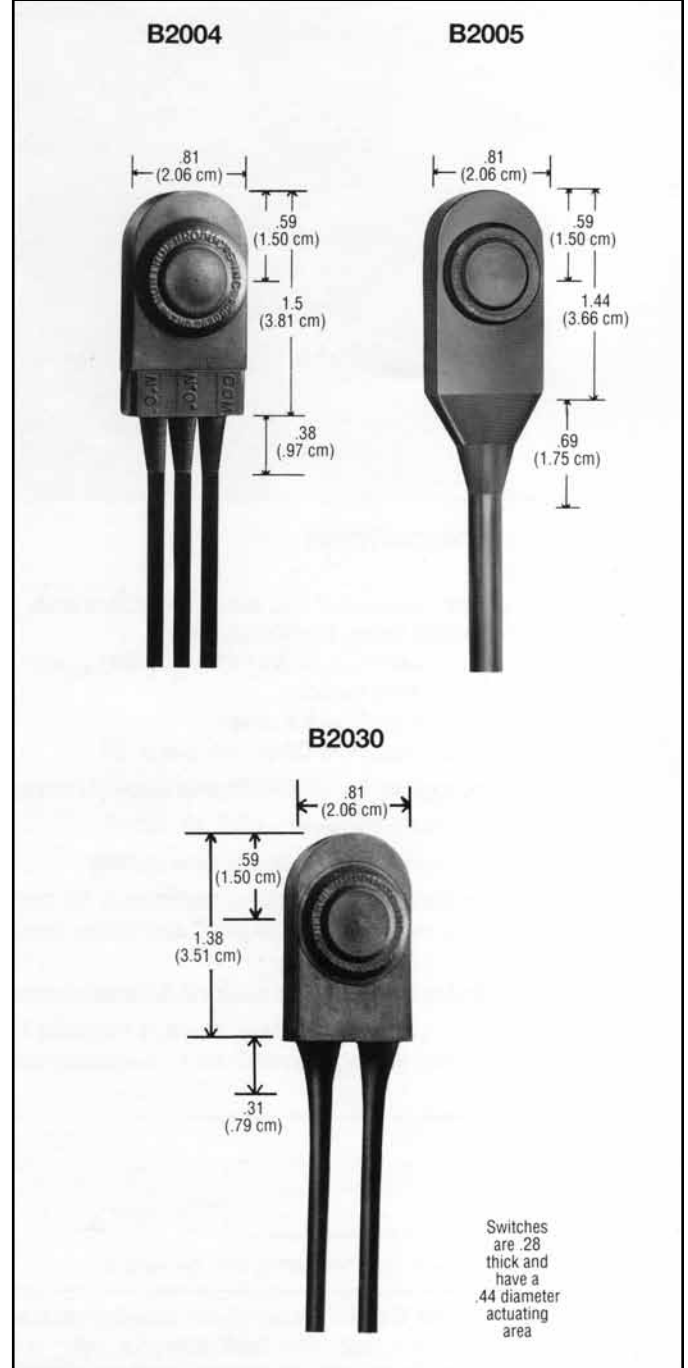
Special terminations: Special cables, wires, coil cords, and connectors available. **See Special Termination and Harnesses, page 19.**



SWITCH BODY DIMENSIONS



SWITCH BODY DIMENSIONS



MILITARY SPECIFICATIONS

CPI PART NUMBER	ORDNANCE NUMBER	ACTION	LEAD LENGTHS
A2007-6	7389132 - (A2001)	N.O.	6-1/4
A2007-31	MS-39058-1 - (A2004)	N.O.	31
A2008-12	MS-39058-2 - (A2005)	N.C.	12-3/16
A2009-12	MS-39058-3 - (A2006)	S.P.D.T.	12-3/16

REQUIREMENT	CPI MEETS OR EXCEEDS MIL. SPEC.
Construction	MS 39058
Material: Rubber Jacket Wire	MS 39058, MIL-R-3065 MS 39058, Ord. #7722204
Corrosion Resistance	MIL-Std. 202 Method 101 A 200 hrs., Salt Spray
Fungus Resistance	MIL-F-13927 90 Days
Water Proofness	MIL-S-13484 B 6 psi internal pressure, 30 min. 6 psi internal vacuum, 30 min. Immersed in Salt Water Solution
Extreme Temp. Res.	MIL-S-13484 B 24 hrs. at -65° ±5°F 24 hrs. at 165° ±5°F Operated 1000 cycles 28 VDC 15A load
Shock Resistance	202A MIL-STD 202A 100 gravity units "g's" 28 VDC 15A (resistive) load during test
Vibration Resistance	201A MIL-STD 202A 1 hr. of vibration 3 major axes repeated in open position (not less than 6 hrs. in vibration) .06 inch double amplitude frequency 10 and 55 Hz return to 10 Hz 28 VDC 15A resistive load during test
Lead Connections	Subjected to a tensile force of 25 pounds along axis of lead and perpendicular to axis of leads

REQUIREMENT	CPI MEETS OR EXCEEDS MIL. SPEC.
Mechanical Actuation	Actuating Force — 1 to 2 pounds Release Force — 6 oz. minimum Release Time — 1/4 sec. maximum at -65°F Pretravel — .015" minimum Overtravel — .015" minimum Differential — .005" maximum
Contact Voltage Drop	MIL-S-13484 B 28 VDC 15A (resistive) load Voltage drop shall not exceed 150 millivolts
Overload	MIL-S-13484 B 28 VDC 22.5A (resistive) 100 "make" and "break" cycles
High Voltage	MIL-S-13484 B 440 Volts (RMS) at 60 Hz 1 min. between leads
Open Circuit Resistance	MIL-S-13484 B Open contacts not less than 1 megohm
Endurance	MIL-S-13484 B 28 VDC 7.5A (inductive) load 7.5A (lamp) load 25,000 "make" and "break" cycles
	115VAC 60 Hz 1/3 HP motor load 5A lamp 10A resistive 25,000 "make" and "break" cycles
	115VAC 60 Hz 4A inductive L/R = .049 8A resistive 100,000 "make" and "break" cycles

B2000 SERIES PART NUMBERS

BUTTON HEIGHT		CONNECTION	ACTION
LOW (3/8")	HIGH (1/2")		
B2002	B2030	2-Wire (1)	NO
B2003	B2031	2-Wire (1)	NC
B2004	B2032	3-Wire (1)	SPDT
B2005	B2046	Cable (2)	NO
B2006	B2047	Cable (2)	NC
B2007	B2048	Cable (3)	SPDT

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

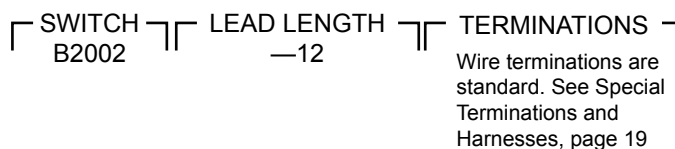
PART NUMBERS	STANDARD LEAD LENGTH	CONNECTION	ACTION
K1005	18"	2-Wire (1)	On / Off
K1007	18"	Cable (2)	On / Off
K1006	18"	2-Wire (1)	NO / Lever
K1008	18"	Cable (2)	NO / Lever
K1009	18"	2-Wire (1)	NC / Lever
K1032	18"	Cable (2)	NC / Lever

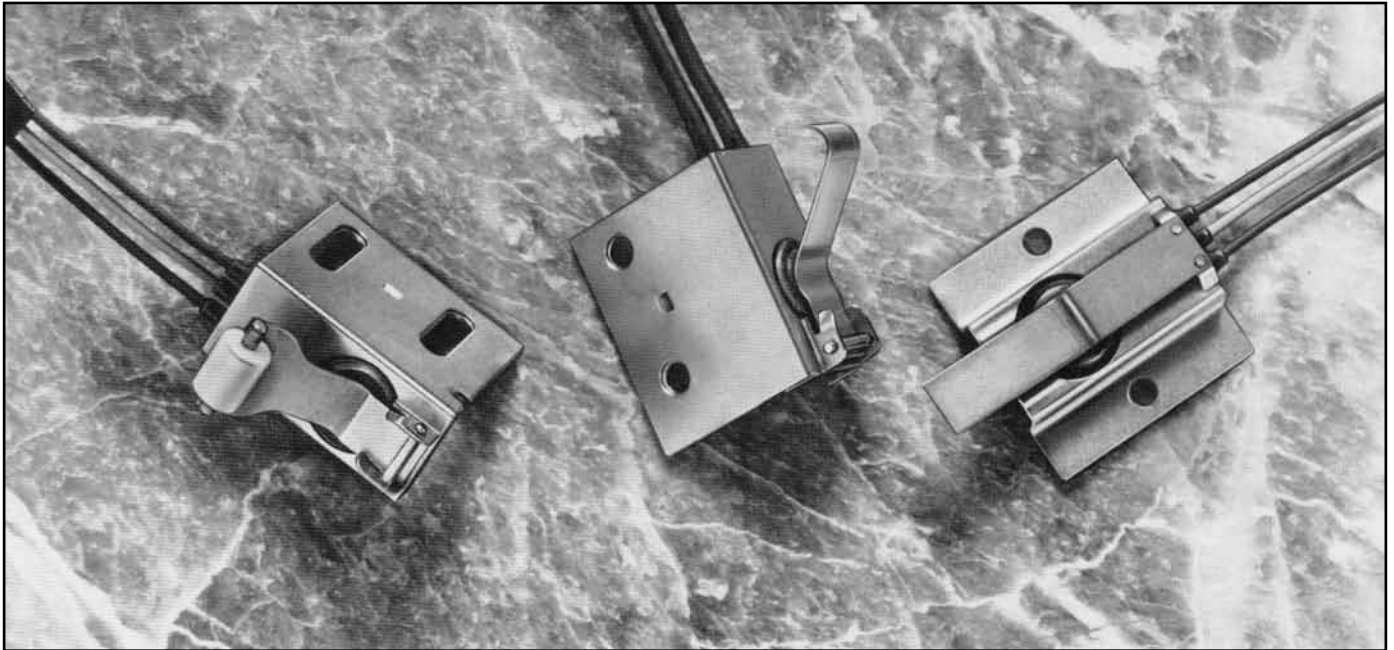
REFERENCES

- (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

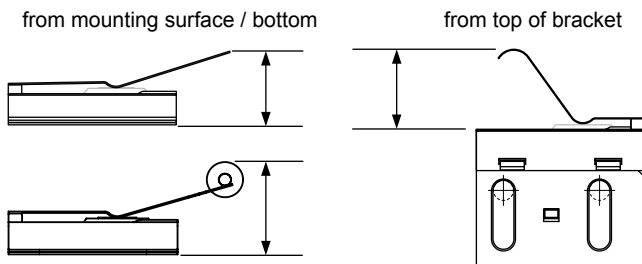
configurations for surface, recessed, and angle mounting, as well as designs for one or two button switches.

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.

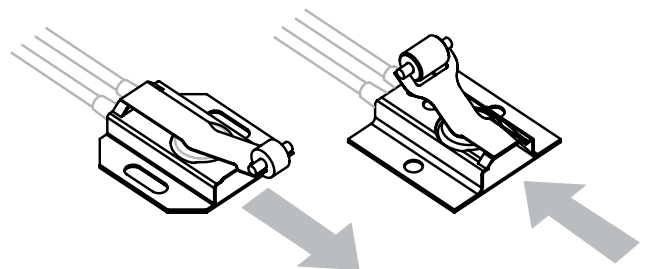
All brackets are fabricated from 302 or 304 stainless steel. Springs are made of 17-7ph stainless steel.

DIMENSIONAL TERMINOLOGY & CONVENTIONS

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



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.

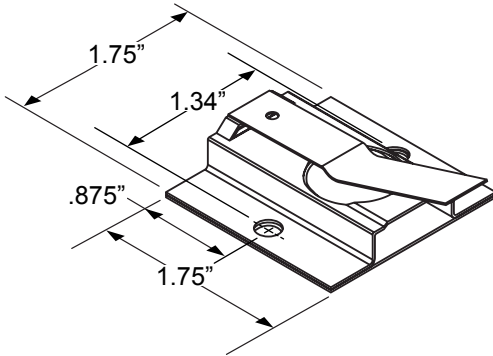
Direction of longitudinal actuation

SURFACE MOUNT SWITCHES

The following are used with low button momentary switches

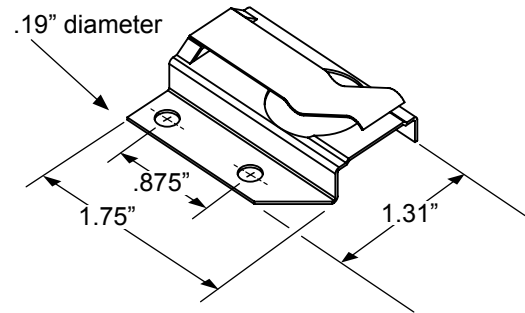
E1094

.755" spring free height from mounting surface



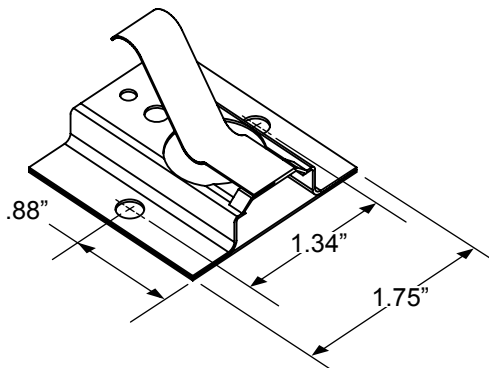
E1078

.69" spring free height from mounting surface



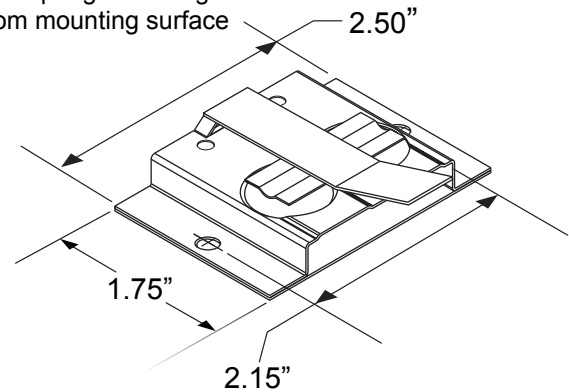
E1127

1.17" spring free height from mounting surface



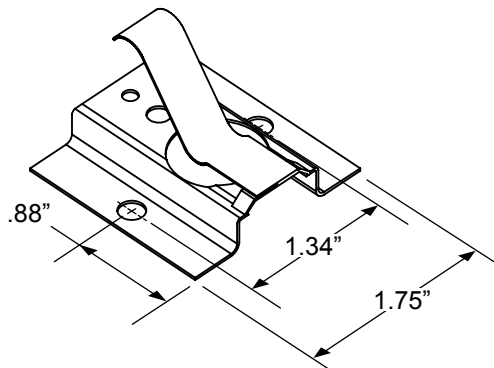
E1046

.71" spring free height from mounting surface



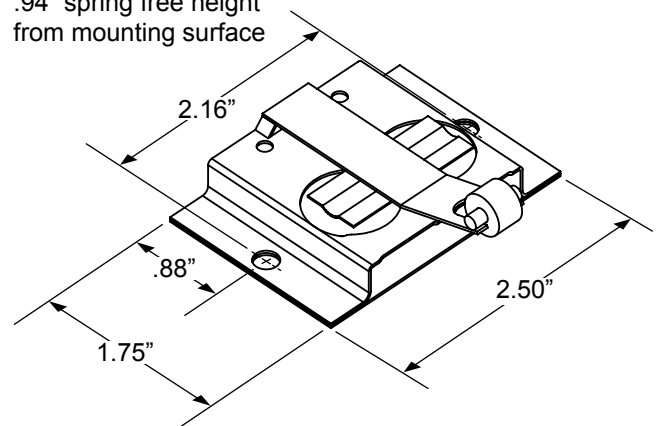
E1115

1.17" spring free height from mounting surface



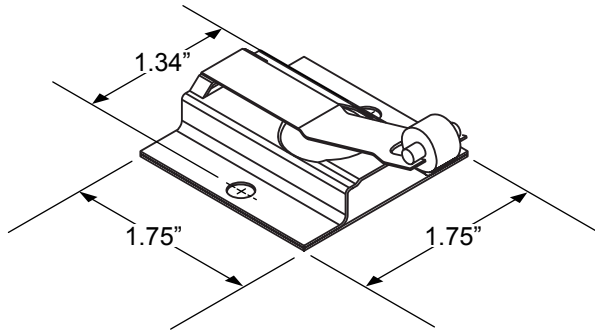
E1085

.94" spring free height from mounting surface

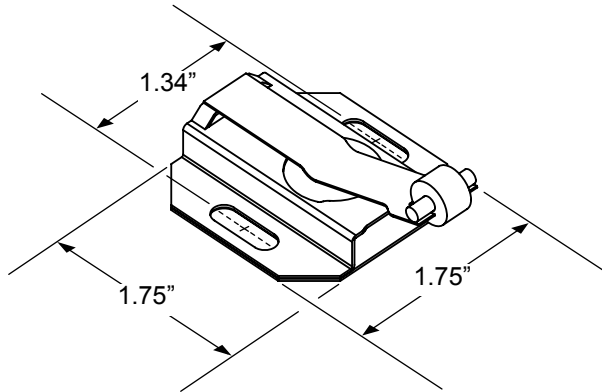


E1096

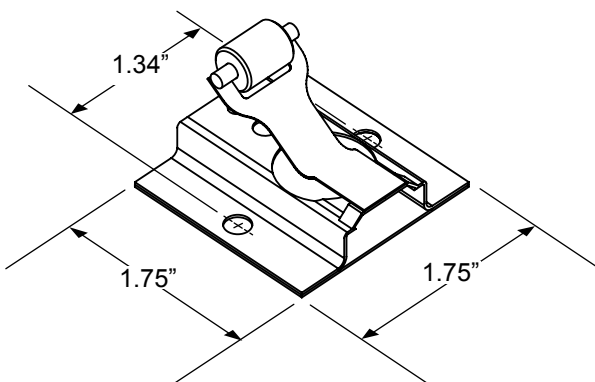
.98" spring free height
from mounting surface


E1134

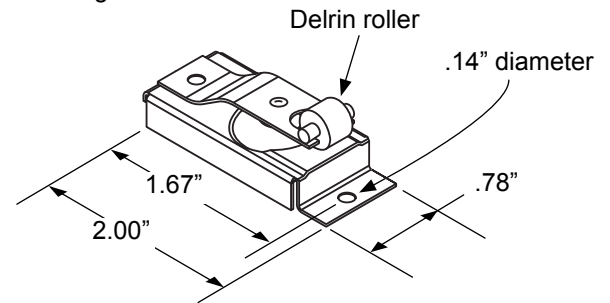
.95" spring free height
from mounting surface


E1283

1.27" spring free height
from mounting surface


E1031

1.17" spring free height
from mounting surface

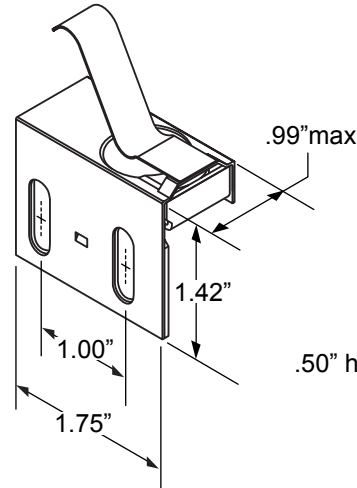


ANGLE MOUNT SWITCHES

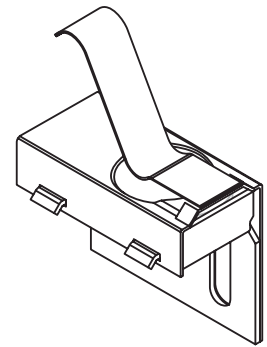
The following are used with low button momentary switches

E1112

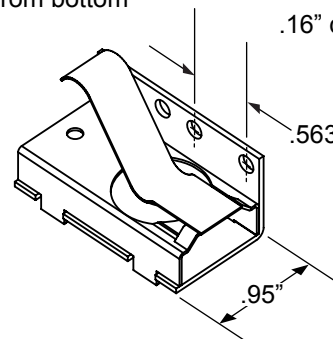
.81" spring free height
from bracket top surface


E1092

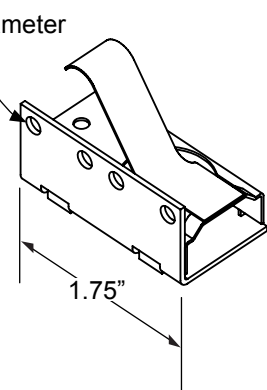
.50" height adjustment


E1310

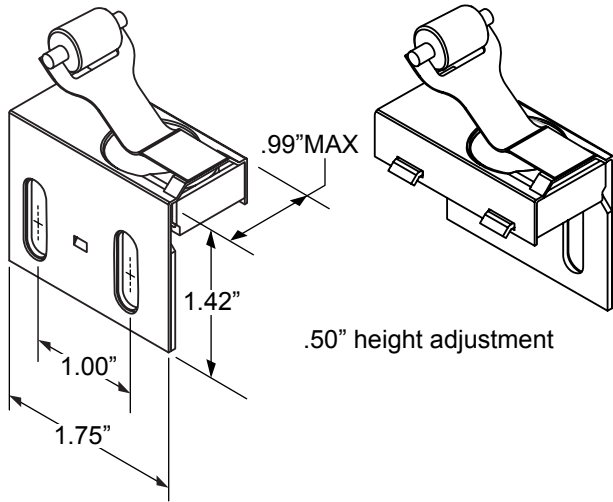
1.188" spring free height
from bottom


E1303

1.75" length

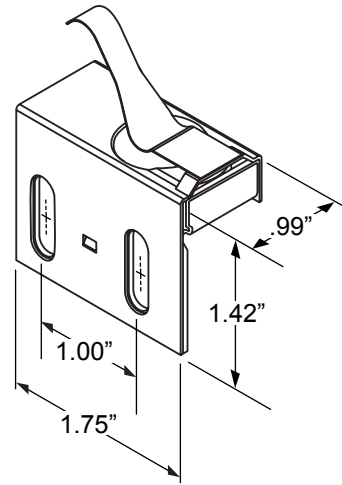


E1161
 .81" spring free height
 from bracket top surface

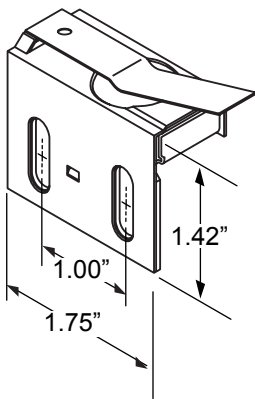


E1117
 .50" height adjustment

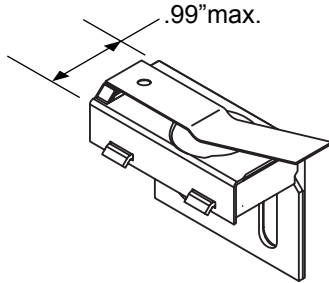
E1129
 .70" spring free height
 from top of bracket



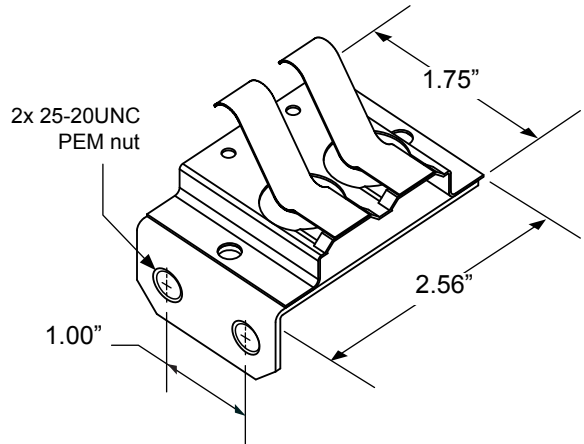
E1100
 .47" spring free height
 from top of bracket



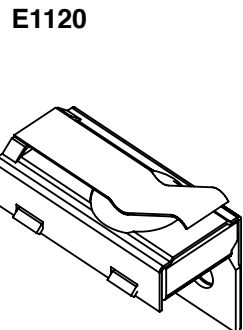
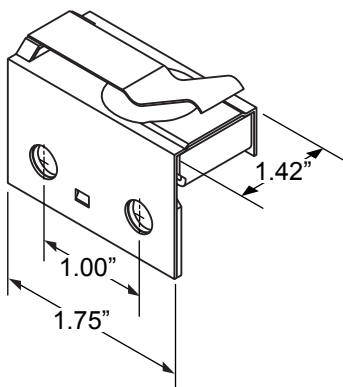
E1101
 .99" max.



E1131
 1.65" spring free height
 from center of mounting holes



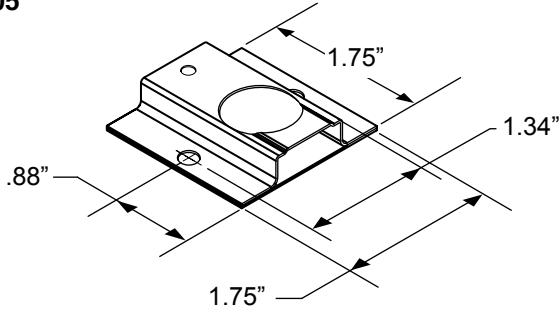
E1118
 .36" spring free height
 from top of bracket



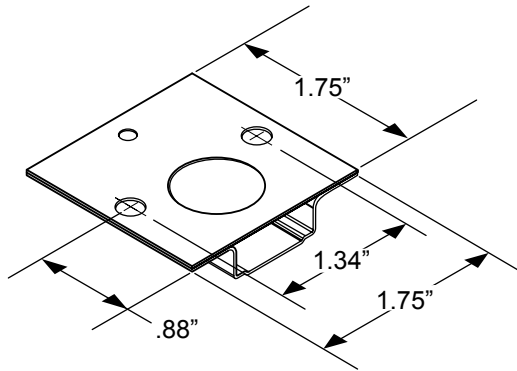
MANUAL ACTUATION SWITCHES

The following may be used with any height button switch.

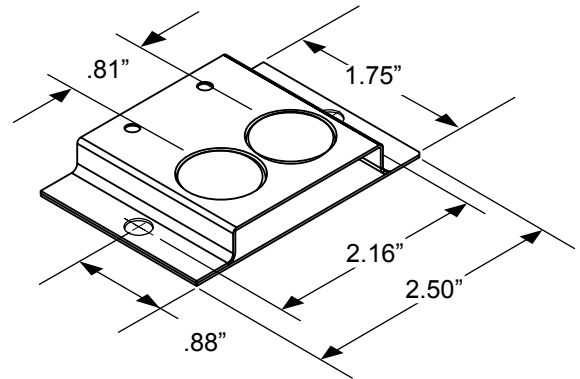
E1005



E1005

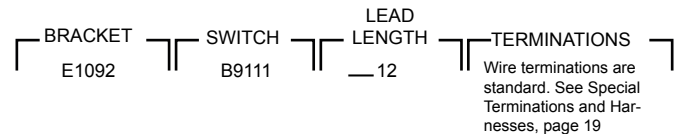


E1058

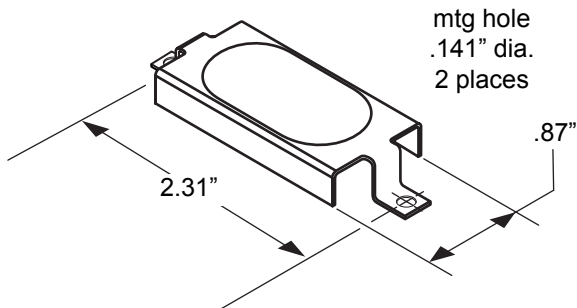


ORDERING INFORMATION:

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.



E1057



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

Switch Endurance - Electrical Loads

Since there are some may 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.

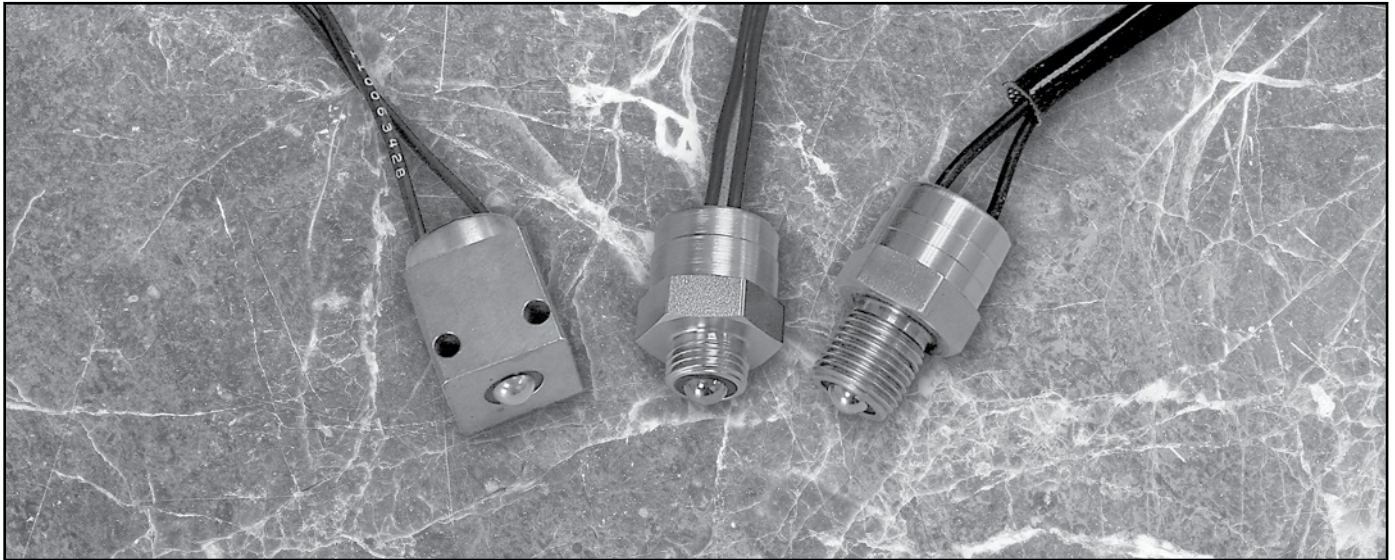
ENDURANCE RATINGS (X 1,000 CYCLES)¹

LOAD	CURRENT				
	2A	5A	7.5A	10A	15A
12VDC					
Resistive	100	100	50	25	25
Lamp	75	50	*	*	*
Inductive	50	25	*	*	*
Motor	10	*	*	*	*
28VDC					
Resistive	100	50	25	25	25
Lamp	35	25	25	*	*
Inductive	35	25	25	*	*
Motor	10	*	*	*	*
120VAC					
Resistive	100	100	75	50	*
Lamp	50	25	12	5	*
Inductive	50	25	*	*	*
Motor	10	*		*	*
240VAC					
Resistive	40	35	30	25	*
Lamp	15	10	6	5	*
Motor	10	*	*	*	*

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® Limit Switches, J4 Series



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.

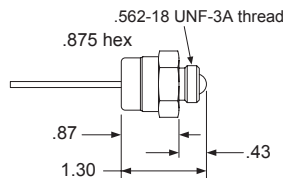


J4001

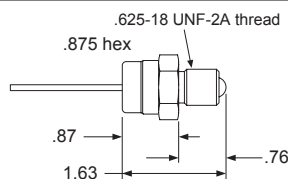
12

Wire terminations are standard. See Special Terminations and Harnesses, page 19

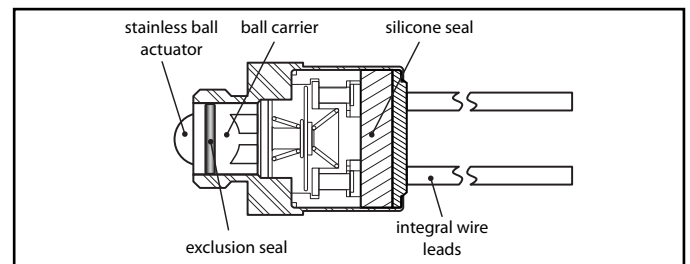
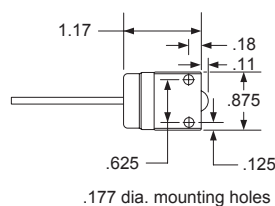
J4001 - NO
J4002 - NC



J4311 - NO
J4312 - 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 400F. Available with normally open or normally closed contacts, these ultra-rugged plunger switches can be found in the harshest environments, including diesel generators, coking 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:

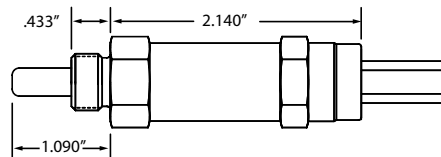
Pre-travel: .004" min., .032" max.

Over-travel: varies by model

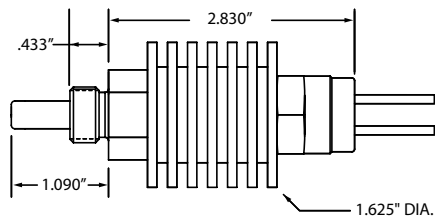
Material: stainless steel

Standard wire: 16 AWG, GXL insulation

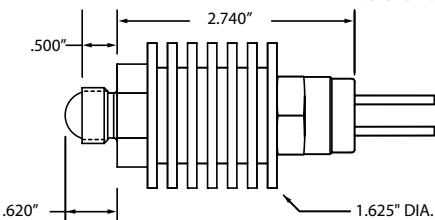
Circuit: SPST momentary, NO and NC available.



7/8" both hexes
 Mounting: M16 x 1.5
 Travel Parameters: please contact factory
 Total Actuator Travel: .657" (approx.)



Mounting: 5/8-18UNF-2A
 Travel Parameters: please contact factory
 Total Actuator Travel: .657" (approx.)
 Operational Temperature: up to 302F



Mounting: 3/4-16UNF-2A
 Travel Parameters: please contact factory
 Total Actuator Travel: .110" (approx.)
 Operational Temperature: up to 400F

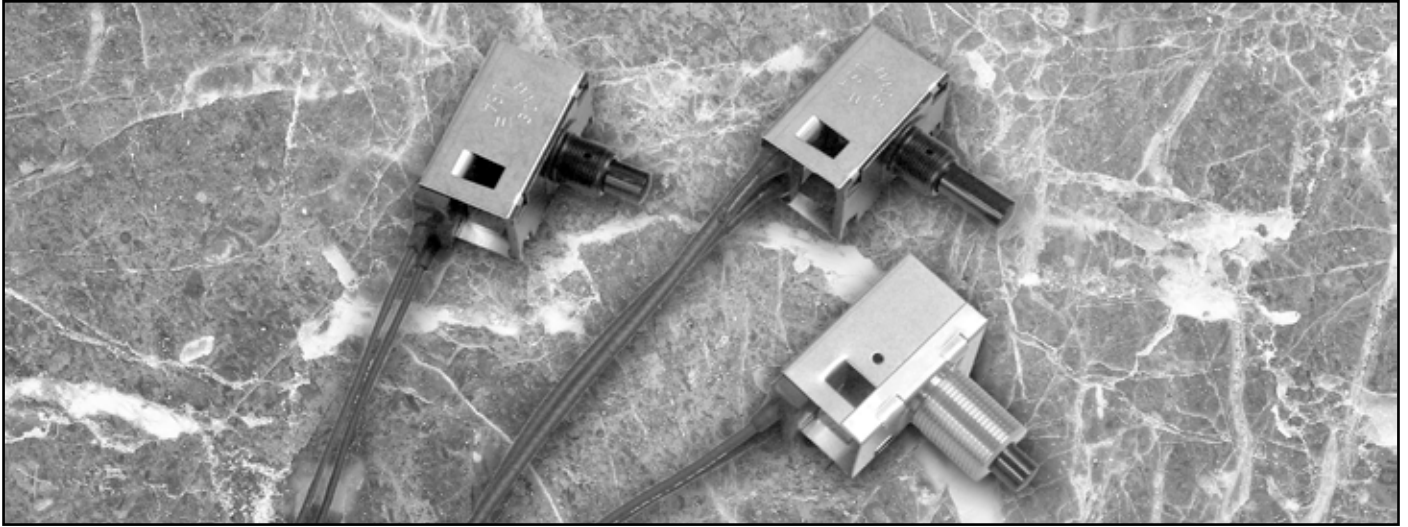


High-temperature Ball Actuator
 operation temperature to 400F

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

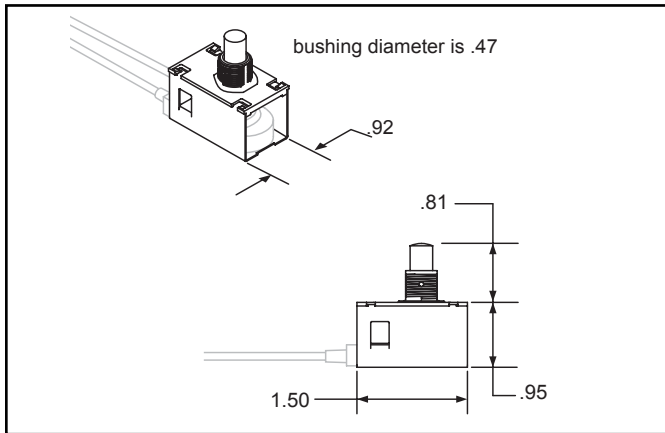
Please contact the factory do discuss your application and for further information on this product.

CPI® Panel Mounted Plunger Switches

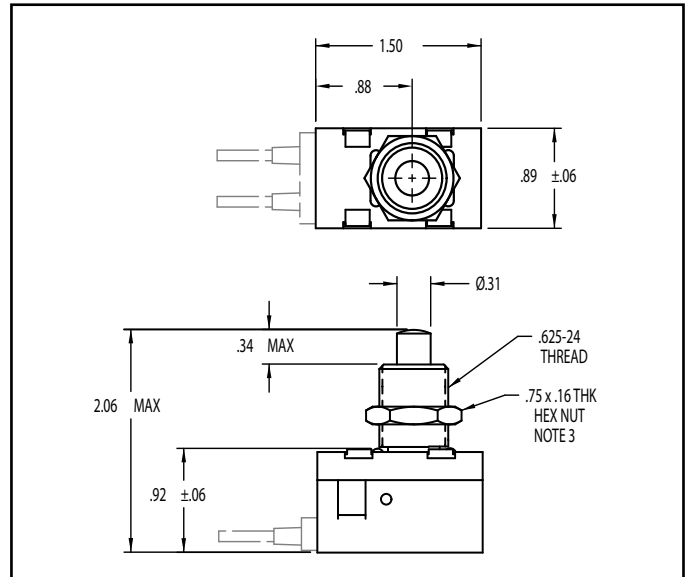


Control Products, Inc. offers pushbutton actuator brackets for panel mounting our industrial or military grade momentary switches for marine, medical, food processing, off-road, and other applications where these types of switches are desired. Except as noted, these actuator brackets can accommodate 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.

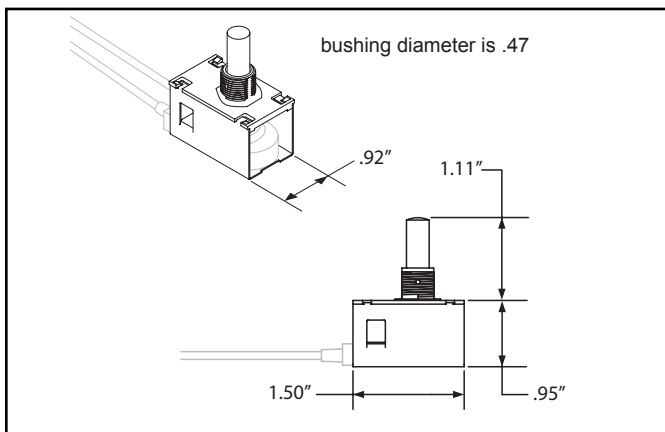
D1021



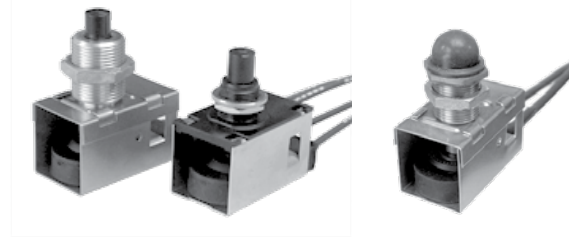
D1040



D1022



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.

CPI® Handle/Pipe Switch Brackets

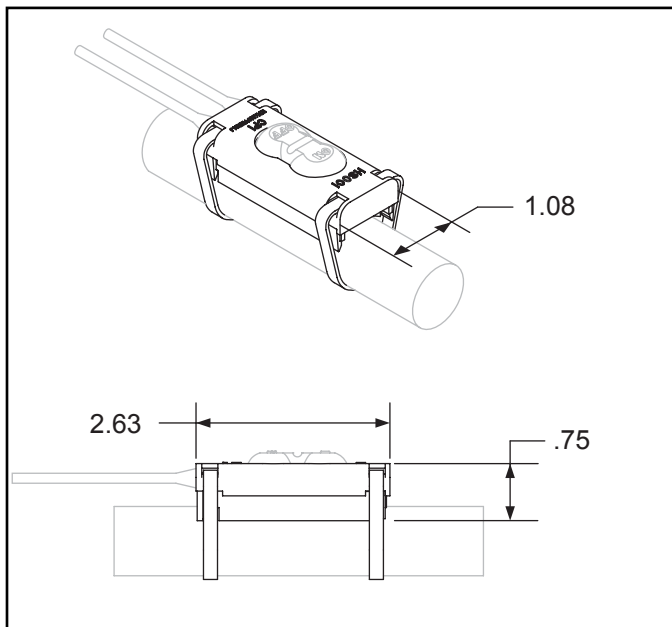


These brackets enable the user to mount many of our waterproof switches to a variety of handles or pipes. Black nylon cable ties provide easy assembly and removal for a wide range of installations such as welding torch handles, equipment railings, control levers and piping assemblies. This gives operators precise control where they need it. Our

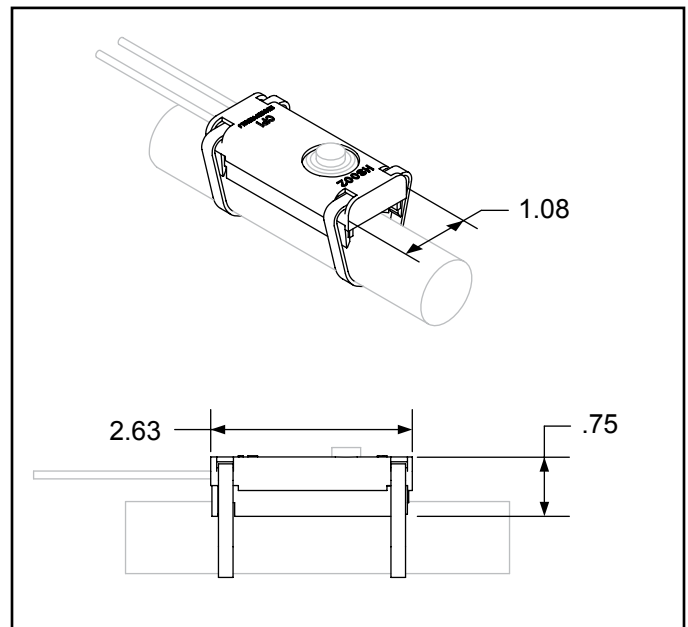
two-button maintained on/off and raised button momentary switches are particularly suited for such applications.

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

HS001



HS002



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.

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.

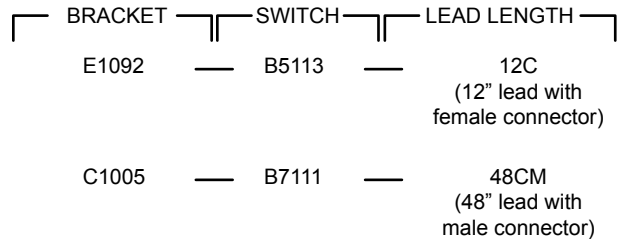
The main advantage is that you will receive a complete assembly from CPI - no need to purchase many individual parts, or reship parts to a third party harness house, In addition, you will receive the highest quality possible, as CPI is your most qualified source when it comes to integrating terminations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



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

PACKARD CROSS REFERENCE TABLE

CPI SWITCH SERIES / DESCRIPTION	PACKARD SHELL USED
B2000/Two wire, "C" designation	12015792
B2000/Two wire, "CM" designation	12010973
B2000/Three wire, "C" designation	12015793
B2000/Three wire, "CM" designation	12010712
B5000, B7000/Two wire, "C" designation	12015792
B5000, B7000/Two wire, "CM" designation	12010973
B5000, B7000/Three wire, "C" designation	12015793
B5000, B7000/Three wire, "CM" designation	12010712
J4, "C" designation	12015792
J4, "CM" designation	12010973

Next Page:

Shown here are a few examples of the harnesses we have supplied to manufacturers of high quality equipment.



Thermal Switches / 0°F to 1750°F



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 1750F.

Linear Position Sensors / 1 to 50 feet sensing range



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.

CERTIFICATIONS

UL/CSA Recognition

Part numbers A2007, A2008, A2009, B2002 through B2005, K1005 and K1008.
 B5 & B7 series are available in a UL recognized configuration upon request.
 File #: E82726(M), Category: NKCR2, component – Auxiliary Devices

IP68

Ingress Protection (IP)
 6 – Dust-tight
 8 – Protected against continuous immersion

ISO 8846

European specification by The International Marine Certification Institute
 Ignition Protection Test (per section 183, part A)
 US Coast Guard Code of Federal Regulations, Section 183
 CPI pushbutton switch (with B Series momentary switch)

ISO9001:2008