

HB Series

Single Pole Standard Precision Snap-acting Switches



Agency Approvals

Agency	Agency File Number
	E42363

Specifications

Contact Rating	From low level ¹ to 20 AMPS @ 480 V AC; see ELECTRICAL RATING option section for complete listings.
Electrical Life	150,000 cycles at 20 AMPS @ 250 V AC. Consult Customer Service Center for typical life at other ratings.
Insulation Resistance	1,000 M ohm min.
Dielectric Strength	1,500 Vrms min. @ sea level
Operating Temperature	-55°C to +150°C
Operating Force	From 4 oz. to 26 oz. max. at actuator button available.
Mounting	Torque 3 in/lbs max. (Note: Exceeding 3 in/lbs torque may change operating characteristics and increase the possibility of cracking switch case).
Terminal Screws	Torque 4 in/lbs max.
Panel Mounting Bushing	Torque 4-6 in/lbs max.
Degree of Protection	IP65; Dust-proof, water splash and dew condensation.

Notes:

1. Low Level—conditions where no arcing occurs during switching. i.e., 0.4 VA max. @ 20 V AC or DC max. Standard electrical life per UL 1054, rated for 6,000 operations.

Description

Designers of thermostats, motors and industrial controls need a highly-responsive, protected switch that can withstand repeated use. That's why so many turn to HB series single pole standard precision snap-acting switch. The HB series features low differential travel and high repeatability; comes in a sealed actuator and case; and is available with single and double pole circuitry, to ensure that thermostats and other controls respond to use the same way – regardless of whether it's the first or the thousandth use.

Features & Benefits

- Low differential travel, high repeatability
- Long life—150,000 cycles typical
- Single and double pole circuitry
- Sealed actuator and case

Applications

- Thermostats
- Motors
- Industrial controls

Materials

Switch Housing	Thermoplastic or general purpose phenolic (UL 94V-0).
Actuator Button	Thermoplastic (UL 94V-0)
Spring	Copper alloy
Pivot	Brass alloy
Movable Contacts	Gold alloy for ratings 1 AMP @ 125 V AC or less. Fine silver for ratings greater than 1 AMP @ 125 V AC.
Stationary Contacts	Gold alloy for ratings 1 AMP or less. Fine silver for ratings greater than 1 AMP.
Terminals	Brass alloy for ratings up to 10 AMPS @ 250 V AC. Copper alloy for 15 AMPS @ 250 V AC ratings.

Notes:

Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service center.

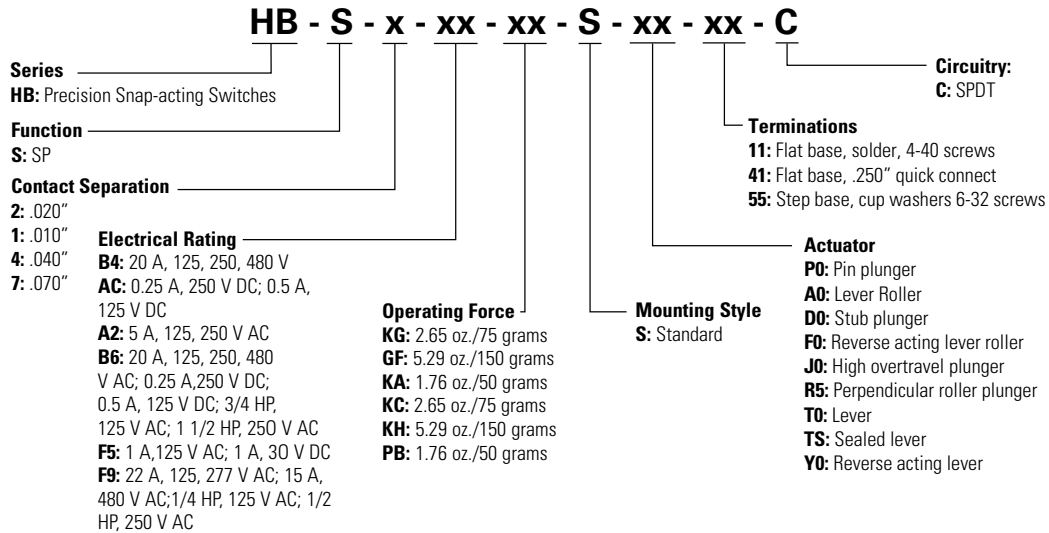
HB Series

Single Pole Standard Precision Snap-acting Switches



Ordering Number

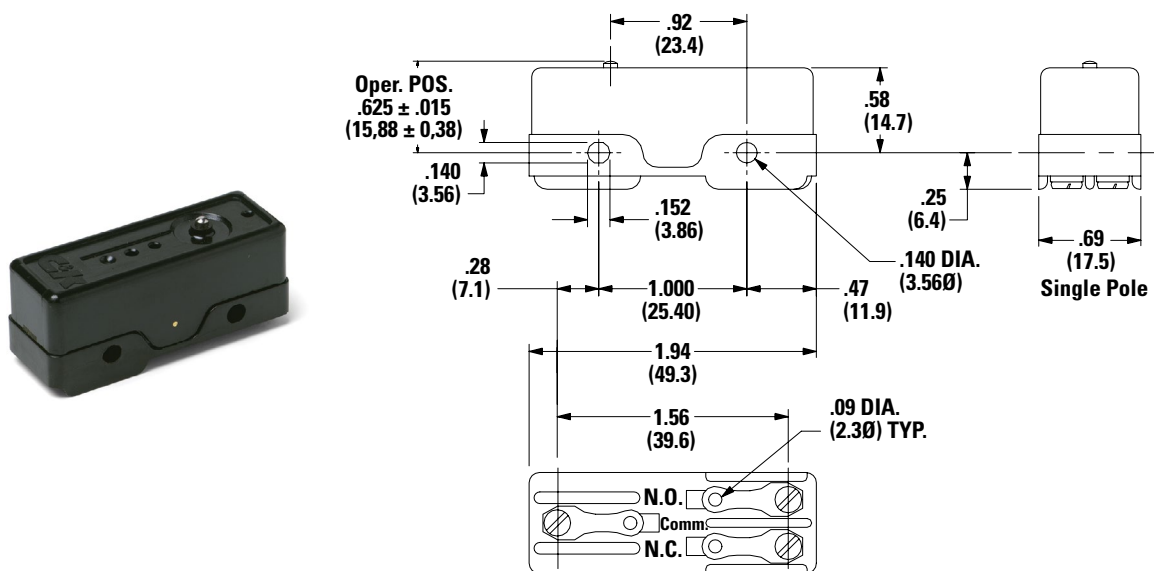
To order, simply select desired option from each category and place in the appropriate box. For additional options not shown in catalog, consult Customer Service Center. Available extended electrical life per UL 1054, rated for 100,000 operations, consult factory.



Sealed Actuator and Case

To provide reliable service under environmental conditions that might damage standard precision switches, various HB Series switch models are sealed against the entrance of airborne contaminants and/or splashing liquids. The clearance between the operating plunger and the cover is sealed with a silicone boot and the base cover joint is sealed with an epoxy adhesive. These models are designed to meet requirements of IP65 (dust proof, water splash and dew condensation). For additional information on sealed switches, consult our Customer Service Center.

HB Series Precision Snap-Acting Switches Dimensions - inches (mm)



Note: To select switching function, see CIRCUITRY section, page J-52.

HB Series

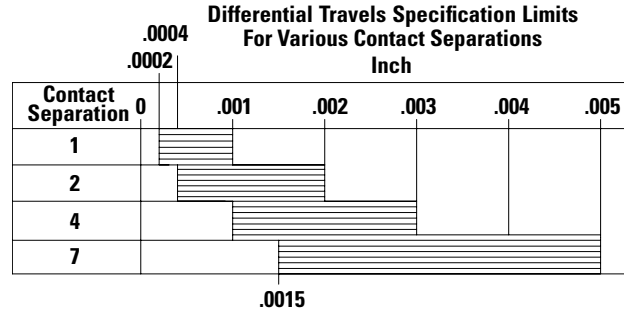
Single Pole Standard Precision Snap-acting Switches



Contact Separation

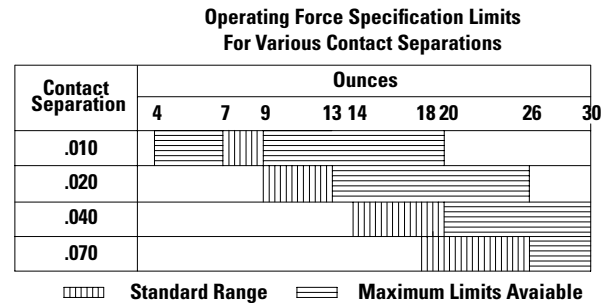
Option Code	Nominal Contact Separation (in./mm)
2	.020 (0.51)
1	.010 (0.25)
4	.040 (1.02)
7	.070 (1.78)

Notes:
Switches with 1 AMP rating (option code 'F5') are available only with .020 contact separation (option '2').
Switches with 1/2 HP, 125 V AC rating or greater (option codes 'B5 and B6') are not available with .010 contact separation (option code '1').



Operating Force

Option Code	Max. Operating Force (oz./grams)	Standard Contact Separation (inch)
KG	18, 510	.020
GF	4, 115	.010
KA	9, 255	.010
KC	13, 370	.020
KH	20, 570	.040
PB	26, 740	.070



Notes:
All listed differential travel characteristics are based on standard operating force and contact separation. For any other force or contact separation, consult Customer Service Center. Operating force varies with actuator option, see ACTUATOR option section.

Electrical Rating

Option Code	Movable Contact	Stationary Contact	Electrical Rating
B4	Fine silver	Fine silver welded to copper base	20 AMPS @ 125, 250 & 480 V AC; 0.25 AMPS @ 250 V DC; 0.5 AMPS @ 125 V DC (UL)
A2	Fine silver	Fine silver welded to copper base	5 AMPS @ 125 & 250 V AC (UL)
B6	Precious metal alloy		20 AMPS @ 125, 250 & 480 V AC; 0.25 AMPS @ 250 V DC; 0.5 AMPS @ 125 V DC; 3/4 HP @ 125 V AC; 1 1/2 HP @ 250 V AC (UL)
F5	Gold alloy		Low level ¹ to 1 AMP @ 125 V AC; 1 AMP @ 30 V DC (UL)
F9	Fine silver	Fine silver welded to copper base	22 AMPS @ 125 & 277 V AC; 15 AMPS @ 480 V AC; 1/4 HP @ 125 V AC; 1/2 HP @ 250 V AC; 277 V AC (UL)

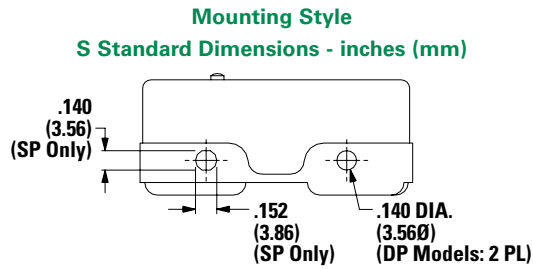
Electrical Rating	Operating Force (oz.)					
	4 GF	9 KA	13 KC	18 KG	20 KH	26 PB
A2	•	•	•	•	•	•
B4	X	•	•	•	•	•
B6	X	X	X	•	•	•
F5	X	X	•	•	•	•
F9	X	X	X	•	•	•

Notes: See Technical Data section of this catalog for RoHS compliant and compatible definition and specifications. • Available. X Not available. All models c us with all options. Consult Customer Service center for availability and delivery of nonstandard ratings.

¹ Low Level=conditions where no arcing occurs during switching, i.e., 0.4 VA max. @ 20 V AC or DC max.

HB Series

Single Pole Standard Precision Snap-acting Switches



Notes:
Mounting holes will accept pins or screws of .139 dia. (3.53) max. on $1.000 \pm .002$ (25.4 \pm 0.05) centers. Torque mounting screws 3 in lbs max.

Actuator

Option Code	No. Poles	Fig.	Dim. A	Dim. B	Dim. C	Dim. D
A0	SP	1	.86 (21.8)	1.120 \pm .060 (28.45 \pm 1.52)	.38 dia. (9.7Ø)	1.03 (26.2)
D0	SP	3	.92 (23.4)	.844 \pm .020 (21.44 \pm 0.51)	-	-
F0	SP	2	.09 (2.3)	1.120 \pm .050 (28.45 \pm 1.27)	.38 dia. (9.7Ø)	.74 (18.8)
J0	SP	4	.86 (21.8)	.860 \pm .030 (21.84 \pm 0.76)	-	-
P0	SP	5	.92 (23.4)	.860 \pm .030 (21.84 \pm 0.76)	-	-
R5	SP	6	.92 (23.4)	.62 (15.7)	.50 dia. (12.7Ø)	.61 (15.5)
T0	SP	7	1.310 (33.27)	.720 \pm .060 (18.28 \pm 1.52)	1.03 dia. (26.2Ø)	-
TS ¹	SP	7	1.47 (37.3)	.720 \pm .060 (18.28 \pm 1.52)	1.03 dia. (26.2Ø)	-
Y0	SP	8	0.05 (1.3)	.720 \pm .030 (18.29 \pm 0.76)	1.03 dia. (26.2Ø)	2.65 (6.73)

Notes:
Actuators sealed against the entrance of airborne contaminants and/or splashing liquids.

Figure 1 Lever Roller

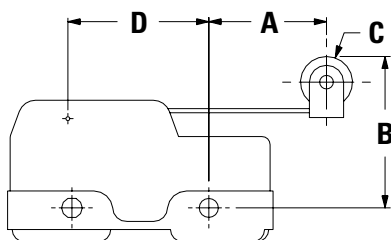
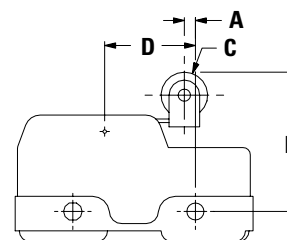


Figure 1 Lever Roller



HB Series

Single Pole Standard Precision Snap-acting Switches



Figure 3 Stub Plunger

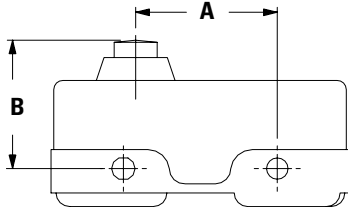


Figure 5 Pin Plunger

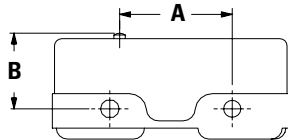
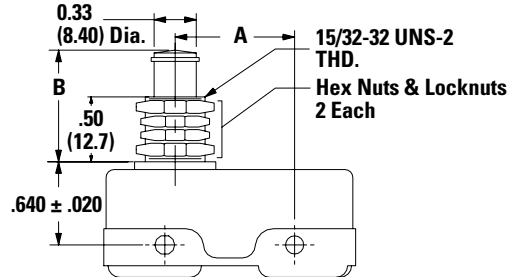


Figure 4 Plunger Dimensions - inches (mm)



Panel Mounting Dimensions - inches (mm)



Figure 6 Perpendicular Roller Plunger Dimensions - inches (mm)

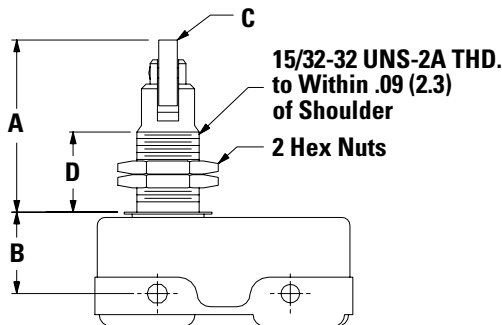


Figure 7 Lever

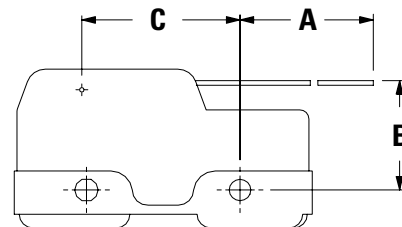
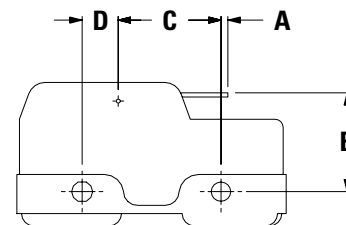


Figure 8 Reverse Acting Lever



HB Series

Single Pole Standard Precision Snap-acting Switches



	Option Code	Actuator								Sealed Actuator ¹	
		A0	D0	F0	J0	P0	R5	T0	Y0	TS	
Max. Operating Force (oz./grams)	GF	-	-	-	-	4 115	-	-	-	-	-
	KA	3 85	9.5 269	10 284	10 284	9 255	10 284	2 60	10 284	2 56	
	KC	-	13 370	10 284	13 370	13 370	13 370	-	10 284	-	
	KG	3.5 100	-	-	-	18 510	-	2.5 71	-	2.5 71	
	KH	4 115	20 570	20 570	20 570	20 570	20 570	3 85	20 570	3 85	
	PB	4.5 130	26 740	20 570	26 740	26 740	26 740	3.5 100	20 570	3.5 100	
Min. Release Force (oz./grams)	GF	-	-	-	-	1 28	-	-	-	-	
	KA	.75 21	4 110	3 85	4 110	4 110	4 110	.5 14	3 85	.5 14	
	KC	1.7 48	4 110	3 85	4 110	4 110	4 110	-	3 85	-	
	KG	.75 21	-	-	-	4 110	-	.5 14	-	.5 14	
	KH	.75 21	4 110	3 85	4 110	4 110	4 110	.5 14	3 85	.5 14	
	PB	.75 21	4 110	3 85	4 110	4 110	4 110	.5 14	3 85	.5 14	

Note: For basic switch operating forces, see page

1. Actuators sealed against the entrance of airborne contaminants and/or splashing liquids.

HB Series**Single Pole Standard Precision Snap-acting Switches****Actuator**

	Option Code	Actuator								Sealed Actuator ¹
		A0	D0	F0	J0	P0	R5	T0	Y0	TS
Max. Differential Travel (in./mm)	GF	-	-	-	-	.0005 (0.013)	-	-	-	-
	KA	.020 (0.51)	.0005 (0.013)	.005 (0.13)	-	.0005 (0.013)	-	.047 (1.19)	.005 (0.13)	.047 (1.19)
	KC	-	.002 (0.05)	.008 (0.20)	-	.002 (0.05)	-	-	.009 (0.23)	-
	KG	.062 (1.57)	-	-	-	.003 (0.08)	-	.078 (1.98)	-	.078 (1.98)
	KH	.080 (2.03)	.003 (0.76)	.020 (0.51)	-	.003 (0.08)	-	.093 (2.36)	.020 (0.51)	.093 (2.36)
	PB	.125 (3.18)	.007 (0.18)	.030 (0.76)	-	.005 (0.13)	-	.156 (3.96)	.031 (0.79)	.156 (3.96)
Max. Pre-Travel (in./mm)	GF	-	-	-	-	.020 (0.51)	-	-	-	-
	KA	.312 (7.92)	.020 (0.51)	0.8 (2.0)	.015 (0.38)	.015 (0.38)	.015 (0.38)	.38 (9.7)	.09 (2.3)	.38 (9.7)
	KC	-	.020 (0.51)	0.8 (2.0)	.020 (0.51)	.020 (0.51)	.020 (0.51)	-	.09 (2.3)	-
	KG	.312 (7.92)	-	-	-	.025 (0.64)	-	.38 (9.7)	-	.38 (9.7)
	KH	.38 (9.7)	.025 (0.64)	0.9 (2.3)	.025 (0.64)	.025 (0.64)	.025 (0.64)	.38 (9.7)	0.9 (2.3)	.38 (9.7)
	PB	.38 (9.7)	.030 (0.76)	0.9 (2.3)	.030 (0.76)	.030 (0.76)	.030 (0.76)	.38 (9.7)	0.9 (2.3)	.38 (9.7)
Min. Over Travel (in./mm)	GF	-	-	-	-	.005 (0.13)	-	-	-	-
	KA	.156 (3.96)	.055 (1.40)	.06 (1.5)	.22 (5.6)	.005 (0.13)	.141 (3.58)	.19 (4.8)	.06 (1.5)	.19 (4.8)
	KC	-	.055 (1.40)	0.9 (2.3)	.22 (5.6)	.005 (0.13)	.141 (3.58)	-	0.9 (2.3)	-
	KG	.156 (3.96)	-	-	-	.005 (0.13)	-	.19 (4.8)	-	.19 (4.8)
	KH	.156 (3.96)	.055 (1.40)	0.9 (2.3)	.22 (5.6)	.005 (0.13)	.141 (3.58)	.19 (4.8)	0.9 (2.3)	.19 (4.8)
	PB	.156 (3.96)	.055 (1.40)	0.9 (2.3)	.22 (5.6)	.005 (0.13)	.141 (3.58)	.19 (4.8)	0.9 (2.3)	.19 (4.8)

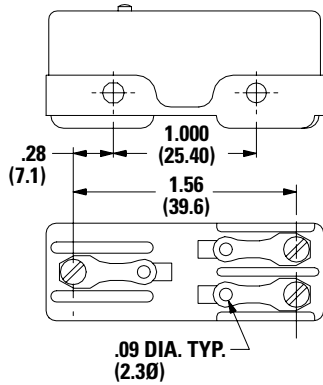
HB Series

Single Pole Standard Precision Snap-acting Switches



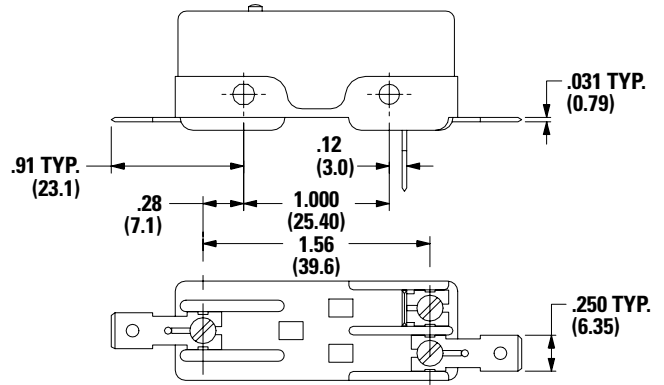
Terminations

11 Flat Base. Solder Terminals and 4-40 Screws
Dimensions - inches (mm)

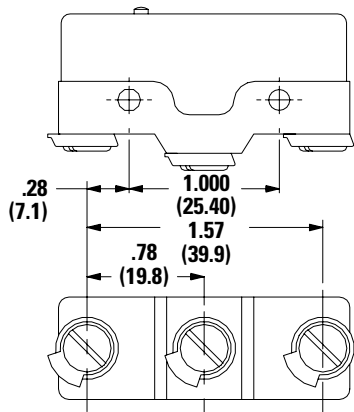


Note: Switches with flat base option have molded ribs that provide increased creep distance.

41 Flat Base. .250" Quick Connect Terminals
Dimensions - inches (mm)



55 Step Base, 6-32 Screws and Cup Washers
Dimensions - inches (mm)



Note: Switches with step base option provide wide electrical clearance for screw terminal options.

Circuitry

C DT (Double Throw, Normally Close & Normally Open)