C&K HB Series
Single Pole Standard Precision Snap-acting Switches

Features/Benefits

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

Typical Applications

- ***Thermostats***
- ***Motors***
- ***Industrial controls***



Models Available

Specifications

CONTACT RATING: From low level* 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: –67°F to 302°F (–55°C to 150°C).

OPERATING FORCE: From 4 oz. to 26 oz. max. at actuator button available.

MOUNTING SCREWS: 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.

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

Materials

SWITCH HOUSING: Heat resistant/electrical grade phenolic.

INSERTS: Brass alloy.

ACTUATOR BUTTON: Moisture resistant phenolic.

SPRING: Copper alloy.

PIVOT: Brass alloy.

MOVABLE CONTACTS: Gold alloy for ratings 1 AMP or less. Fine silver for ratings greater than 1 AMP and motor load ratings less than 1/2 HP @ 125 V AC. Precious metal alloy for motor load ratings 1/2 HP @ 125 V AC or greater.

STATIONARY CONTACTS: Gold alloy for ratings 1 AMP or less. Fine silver welded to copper base for ratings greater than 1 AMP and motor load ratings less than 1/2 HP @ 125 V AC. Precious metal alloy on copper base for motor load ratings 1/2 HP @ 125 V AC or greater.

TERMINALS: Brass alloy, bright tin plated.

NOTE: For the latest information regarding RoHS compliance, please go to: www.ittcannon.com/rohs.

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

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages K-38 thru K-43. For additional options not shown in catalog, consult Customer Service Center.

H	B		S						S						C

Series
HB Precision Snap-acting Switches

Function
S SP

Contact Separation
2 .020"
1 .010"
4 .040"
7 .070"

Operating Force
KG 18 oz./510 grams
GF 4 oz./113 grams
KA 9 oz./255 grams
KC 13 oz./368 grams
KH 20 oz./567 grams
PB 26 oz./737 grams

Electrical Rating
B4 20 A, 125, 250, 480 V AC; 0.25 A, 250 V DC; 0.5 A, 125 V DC
A2 5 A, 125, 250 V AC
B6 20 A, 125, 250, 480 V AC; 0.25 A, 250 V DC; 0.5 A, 125 V DC; 3/4 HP, 125 V AC; 1 1/2 HP, 250 V AC
F5 1 A,125 V AC; 1 A, 30 V DC
F9 22 A, 125, 277 V AC; 15 A, 480 V AC; 1/4 HP, 125 V AC; 1/2 HP, 250 V AC
X3 20 A, 125, 250, 480 V AC; 0.25 A, 250 V DC; 0.5 A, 125 V DC; 15(10) A, 380 V~ 185 ⧺ µ (VDE)

Actuator
P0 Pin plunger
A0 Lever roller
D0 Stub plunger
F0 Reverse acting lever roller
J0 High overtravel plunger
R5 Perpendicular roller plunger
T0 Lever
TS Sealed Lever
Y0 Reverse acting lever

Mounting Style
S Standard

Terminations
11 Flat base, solder, 4-40 screws
41 Flat base, .250" quick connect
55 Step base, cup washers, 6-32 screws

Circuitry
C SPDT

C&K HB Series
Single Pole Standard Precision Snap-acting Switches

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.

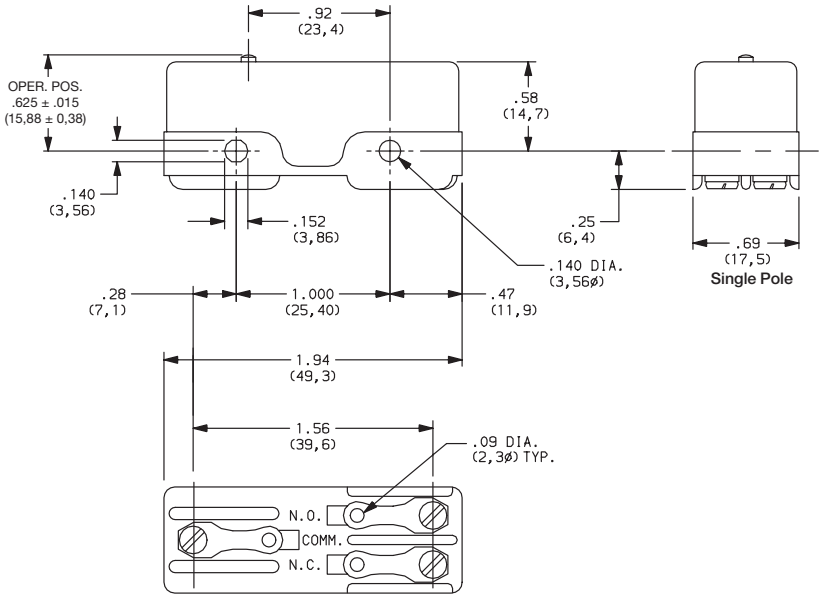
SERIES

HB PRECISION SNAP-ACTING SWITCHES

FUNCTION

S SINGLE POLE SWITCH





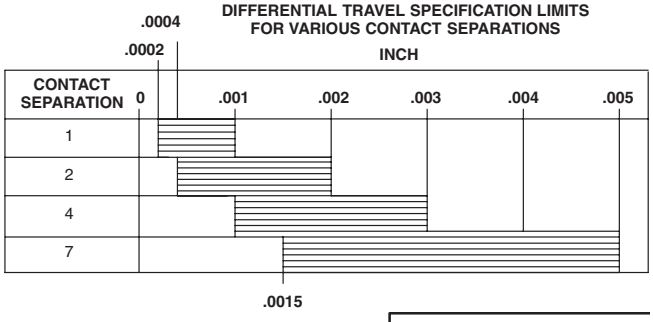
NOTE: To select switching function, see CIRCUITRY section, page K-42.

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)

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').



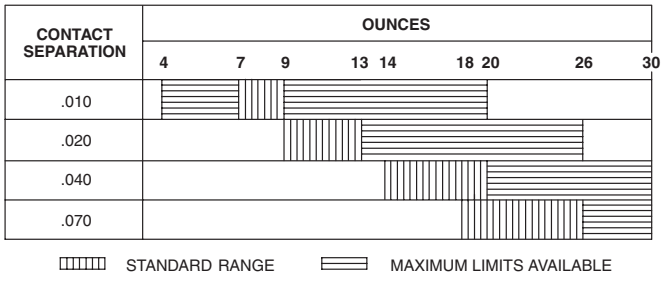
Third Angle Projection

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

OPERATING FORCE

OPTION CODE	MAXIMUM 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

OPERATING FORCE SPECIFICATION LIMITS FOR VARIOUS CONTACT SEPARATIONS



NOTE: All listed differential travel characteristics are based on standard operating force andcontact 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	RoHS COMPLIANT*	RoHS COMPATIBLE*	MOVABLE CONTACT	STATIONARY CONTACT	ELECTRICAL RATING
B4	Yes	Yes	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/CSA).
A2	Yes	Yes			5 AMPS @ 125 & 250 V AC (UL/CSA).
B6	Yes	Yes	Precious metal alloy.	Precious metal alloy.	20 AMPS @ 125, 250 & 480 V AC; 0.25 AMP @ 250 V DC; 0.5 AMP @ 125 V DC; 3/4 HP @ 125 V AC; 1 1/2 HP @ 250 V AC (UL/CSA).
F5	Yes	Yes	Gold alloy.	Gold alloy.	Low level* to 1 AMP @ 125 V AC; 1 AMP @ 30 V DC (UL/CSA).
F9	Yes	Yes	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/CSA).
X3	Yes	Yes	Fine silver.	Fine silver welded to copper base.	20 AMPS @ 125, 250, 480 V AC; 0.25 AMP @ 250 V DC, 0.5 AMP @ 125 V DC (UL/CSA); 15 (10) AMPS @ 380 V~ T85 50E3 m (VDE).

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definition and specifications.

EUROPEAN SYMBOLS	
m	Microgap construction (less than 4 mm).
~	Alternating current.
T__	Maximum rated use temperature.
50E3	Cycles over 50,000 at rated current.
10(3)	First number represents resistive rating; second number represents inductive (motor) rating.

AVAILABLE COMBINATIONS

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	•	•	•
X3	x	•	•	•	•	•

• AVAILABLE
x NOT AVAILABLE

All models ® with all options, also available.

Consult Customer Service center for availability and delivery of nonstandard ratings.

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

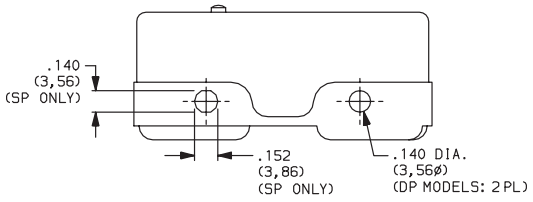
Third Angle Projection

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

C&K HB Series
Single Pole Standard Precision Snap-acting Switches

MOUNTING STYLE

S Standard



NOTE: Mounting holes will accept pins or screws of .139 dia. (3,53) max. on 1.000 ± .002 (25,4 ± 0,05) centers.

NOTE: Torque mounting screws 3 inlbs max.

ACTUATOR

OPTION CODE	NO. POLES	FIG.	DIM. A	DIM. B	DIM. C	DIM. D
A0	SP	1	.86 (21,8)	1.120 ± .060 (28,45 ± 1,52)	.38 dia. (9,7Ø)	1.03 (26,2)
D0	SP	3	.92 (23,4)	.844 ± .020 (21,44 ± 0,51)	—	—
F0	SP	2	.09 (2,3)	1.120 ± .050 (28,45 ± 1,27)	.38 dia. (9,7Ø)	.74 (18,8)
J0	SP	4	.86 (21,8)	.860±.030 (21,84±0,76)	.64 dia. (16,3Ø)	0.33 (8,40)
P0	SP	5	.92 (23,4)	.625 ± .010 (15,88 ± 0,25)	—	—
RS	SP	6	.92 (23,4)	.62 (15,7)	.50 dia. (12,7Ø)	0.61 (15,5)
T0	SP	7	1.310 (33,27)	.720 ± .060 (18,28 ± 1,52)	1.03 dia. (26,2Ø))	—
TS*	SP	7	1.47 (37,3)	.720 ± .060 (18,28 ± 1,52)	1.03 dia. (26,2Ø)	—
Y0	SP	8	.05 (1,3)	.720 ± .030 (18,29 ± 0,76)	.74 dia. (18,8Ø)	2.65 (6,73)

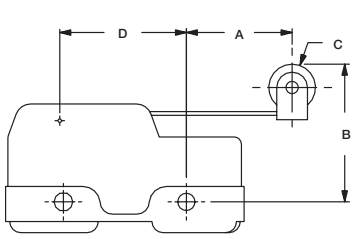


FIG. 1
Lever Roller

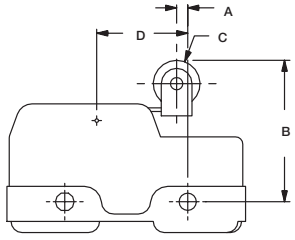


FIG. 2
Lever Roller

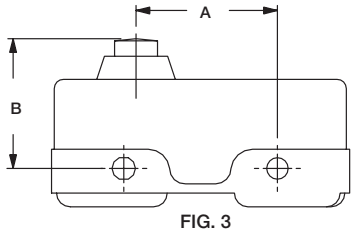


FIG. 3
Stub Plunger

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

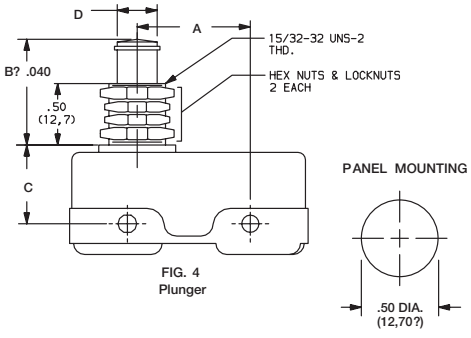


FIG. 4
Plunger

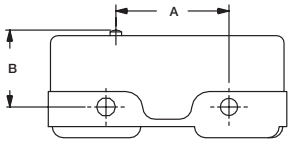


FIG. 5
Pin Plunger

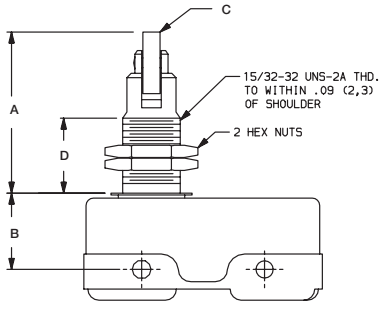


FIG. 6
Perpendicular Roller Plunger

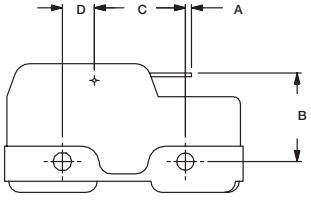


FIG. 8
Reverse Acting Lever

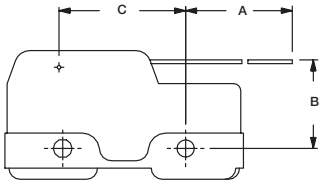


FIG. 7
Lever

Third Angle Projection

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

ACTUATOR

	OPTION CODE	ACTUATOR								* SEALED ACTUATOR
		A0	D0	F0	J0	P0	R5	T0	Y0	TS
MAXIMUM 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
MAXIMUM 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	—	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 K-39.

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

C&K HB Series
Single Pole Standard Precision Snap-acting Switches

ACTUATOR

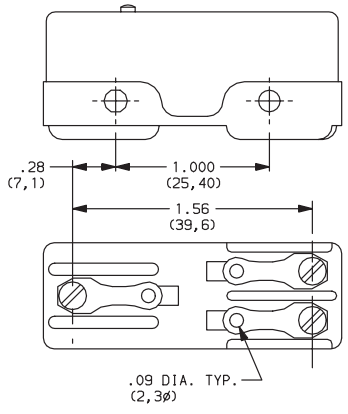
	OPTION CODE	ACTUATOR								* SEALED ACTUATOR
		A0	D0	F0	J0	P0	R5	T0	Y0	TS
MAXIMUM DIFFERENTIAL TRAVEL (IN/MM)	GF	–	–	–	–	.0005 (0,013)	–	–	–	–
	KA	.020 (0,51)	.0005 (0,013)	.005 (0,13)	–	.0005 (0,013)	–	.047 (1,19)	.005 (0,13)	.047 (1,19)
	KC	–	.002 (0,05)	.008 (0,20)	–	.002 (0,05)	–	–	.009 (0,23)	–
	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)
MAXIMUM PRETRAVEL (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)
MINIMUM OVERTRAVEL (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)

NOTE: For basic switch operating forces, see page K-39.

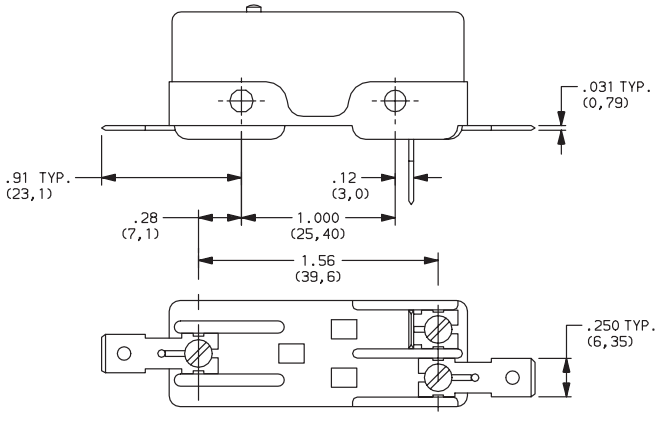
* Actuators sealed against the entrance of airborne contaminants and/or splashing liquids.

TERMINATIONS

11 FLAT BASE, SOLDER TERMINALS AND 4-40 SCREWS



41 FLAT BASE, .250" QUICK CONNECT TERMINALS



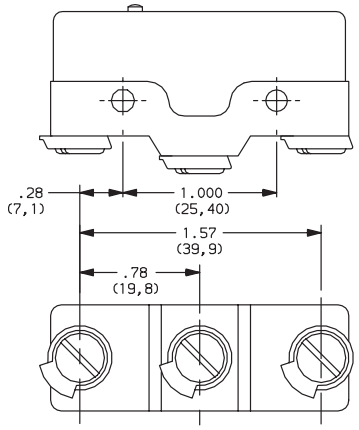
NOTE: Switches with flat base option have molded ribs that provide increased creep distance.

Third Angle Projection

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

TERMINATIONS

55 STEP BASE, 6-32 SCREWS AND CUP WASHERS



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

CIRCUITRY

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