



MASTER CATALOG

Switches



QUALITY IN A

Global Marketplace

Cherry has been the leader in switch innovation since its inception in 1953. To better serve our customers in today's global marketplace, we now maintain offices and manufacturing facilities in eleven locations worldwide — each with its own engineering and sales staff.

Cherry's principal production capabilities include:

- Complex, multi-station die design and build capabilities, utilizing the latest in-die sensing and slug detection techniques
- In-die welding and contact inserting capabilities, which eliminate costly secondary operations.
- Precision metal stamping, using presses ranging from 40 to 100 tons and press speeds from 200 to 1000 strokes per minute
- Plastic Molding — Thermoset/ Thermoplastic, Double Shot, Insert, Decorative Class "A"
- Low cost laser marking on piece parts and finished assemblies
- Robotic switch assembly and testing to ensure the highest quality standards

We are committed to meeting or exceeding the highest standards for quality assurance — not only in our products, but also in our processes. Our primary objective is to achieve zero defects in every aspect of our activities. As part of our pre-emptive strategy, the prevention of defects always takes precedent over their detection.

The quality assurance processes at Cherry's manufacturing facilities in the United States, Europe and Asia have been certified under ISO 9001 and ISO 14001 Environmental.

Cherry Locations Worldwide

The Cherry Corporation
Waukegan, Illinois, USA

Cherry Mikroschalter GmbH
Auerbach, Germany

Cherry Electrical Products Division
Pleasant Prairie, Wisconsin, USA

Cherasia Limited
Hong Kong

Cherry Electrical Products Ltd.
Harpden, England

Cherry SRO
Klasterec, Czech Republic

Cherry de Mexico, S.A. de C.V.
Juarez, Mexico

Cherry SARL
Paris, France

Cherry Australia Pty. Ltd.
Melbourne, Australia

Hirose Cherry Precision Company Ltd.
Kawasaki, Japan

TVS Cherry Private Limited
Madurai, India



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SNAP-ACTION SWITCH

Selection Guide

Series Name	Switch Type (Size)	Max. Current Rating	VDE Approved	Mounting			Degree of Protection	Mounting Centerline Spacing Inches (mm)	Max. Temperature (°C)	Poles / Throws					Terminals					Actuator Types					
				Snap-In	Mounting Holes	Threaded Ferrule				PC Mount	SPST	SPDT	DPDT	NO	NC	Line Interrupt	Screw	PC	Solder Terminals	Quick Connect	DIN	Lead Wires	Button Only	Wire Form	Flat Lever
DR	Subminiature	2A DC* 12V				●	IP40	N/A	105		●					●	●			●		●			
DA	Subminiature	0.1A 125VAC	●		●	●		0.375 (9.53)	85	●	●		●	●		●	●	●	●		●		●	●	●
DB	Subminiature	10.1A 125/250VAC	●		●	●	IP40	0.374 (9.50)	120	●	●		●	●		●	●	●	●		●		●	●	●
DG	Subminiature	3A 125VAC			●	●		0.256 (6.50)	85		●					●					●		●		●
DH	Subminiature	500mA @30VDC			●	●		0.157 (3.99)	70		●					●					●			●	
E6x	Subminiature	13A 125VAC			●	●		0.375 (9.53)	130	●	●		●	●		●	●	●			●		●	●	●
DK	Subminiature	2A DC* 12V				●	IP65 (IP67 on request)	N/A	105		●		●	●		●	●			●	●		●	●	
DCJK	Subminiature	10A 250VAC			●		IP67	0.375 (9.53)	120		●					●	●			●	●		●	●	●
DJ	Subminiature	2A DC* 12V				●	IP67	N/A	85		●					●	●			●					
E7x	Subminiature	10.1A 125/250VAC			●			0.625 (15.88)	85	●	●		●	●				●		●	●		●		●
DC	Subminiature	10.1A 125/250VAC	●		●	●	IP67	0.375 (9.53)	120	●	●		●	●		●	●	●		●	●		●	●	●
D3	Miniature	16(4)A 250V	●		●	●		0.875 (22.2)	85	●	●		●	●		●	●	●	●		●		●	●	●
D4	Miniature	21(8)A 250VAC	●		●	●		0.875 (22.2)	150	●	●		●	●		●	●	●	●		●		●	●	●
E5x	Miniature	6A 250VAC			●			0.937 (23.8)	85	●	●		●	●				●				●			
E Miniature	Miniature	25A 125/250VAC			●			0.875 (22.2)	150	●	●		●	●		●	●	●			●		●	●	●
K	Miniature	25A 250VAC	●		●	●		0.875 (22.2)	200	●	●		●	●		●	●			●		●	●	●	●
E General Purpose	General Purpose	30.1A 125/250VAC			●	●		1.00 (25.4)	150	●	●	●	●	●			●			●		●			●
E Panel Mount	Panel Mount	16A 125/250VAC	●	●				N/A	85	●	●	●	●	●			●			●					
F80	Line Interrupt	16A 125/250VAC	●	●				N/A	85						●		●			●					

*DR, DK and DJ Series: 2A@12VDC



PANEL MOUNT ROCKER SWITCH

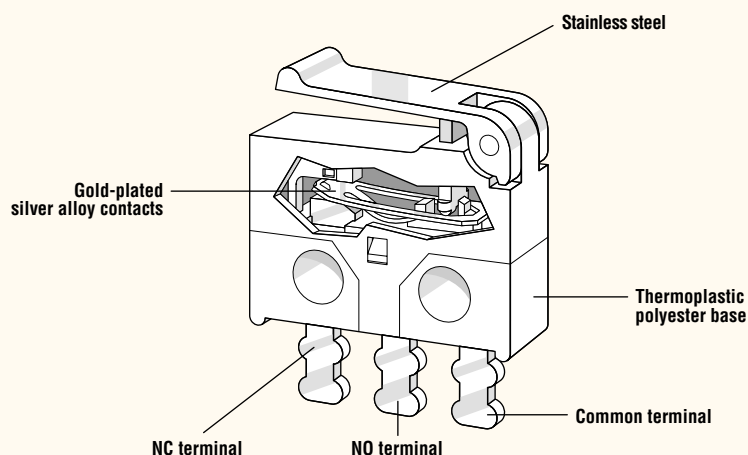
Selection Guide

Series Name	Panel Cut-Out Approx Inches (mm)	Circuitry										Ratings			Degree of Protection Available	Terminals							Approvals			Actuator Types			
		SPST	SPDT	DPST	DPDT	On-Off	On-On	(On)-Off	On-(On)	On-Off-On	(On)-Off-(On)	On-Off-(On)	Amp Raing@125VAC	Amp Raing@250VAC		Lighted Available	Quick Connect 0.187" (4.8mm)	PC thru Hole Left Angle	PC thru Hole Straight	Solder Tab	Solder 2.09" x 1.06" (52.09mm x 26.92mm)	PC thru Hole Right Angle	Quick Connect 0.248" (6.3mm)	Wire Leads	UL	VDE	CSA	Flat	2 Color
CR	1.13 (28.8) x variable	●	●			●	●			●		20A	16A	●	IP42				●			●		●	●	●		●	●
LR	0.760 x 0.508 (19.3 x 12.9)	●		●	●	●						10A	8A	●		●		●			●			●	●	●			●
SR	0.760 x 0.508 (19.3 x 12.9)	●	●			●	●	●		●		10A	6A			●	●	●		●	●			●	●	●			●
TR	1.20 x 0.433 (30.4 x 11.0)	●	●			●	●	●	●	●	●	16A	16A	●								●		●	●	●	●		●
WR	1.19 x 0.867 (30.2 x 22.0)	●	●	●	●	●	●	●	●	●	●	16A	16A	●								●		●	●	●	●		●
RR	Round 0.787 (20.0) dia.	●		●	●	●						10A	8A	●		●		●			●			●	●	●			●
GR	1.13 x 0.535	●	●			●	●					15A	10A	●								●	●	●		●			●

SUBMINIATURE DH Series

Features

- Ultraminiature dimensions, just 0.323" x 0.106" x 0.244" (8.2mm x 2.7mm x 6.2mm)
- Specially designed for low switching currents and voltages
- Available with or without integrated auxiliary actuator
- Can be fitted to circuit boards in upright position or horizontally with formed terminals



Electrical Ratings

Switch Series	Electrical Rating
DH3	50 to 300mA@30VDC
DH4	5 to 50mA@30VDC

Specifications

Electrical	
Temperature Rating:	-25°C to +70°C
Flammability Rating:	UL94V-O

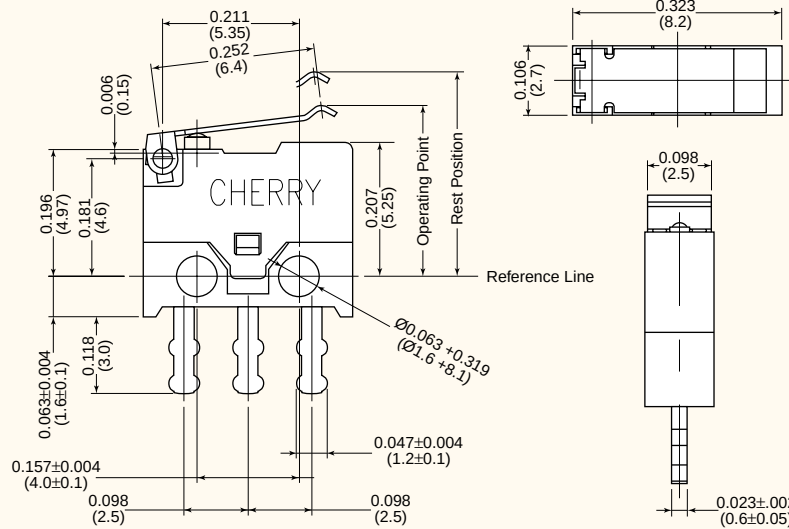
Materials	
Base:	PPS
Button:	PBT
Cover:	PBT
Auxiliary Actuator:	Stainless Steel
Terminals:	Silver-Plated Brass
Contacts:	Silver-Plated Brass (DH3) Gold-Plated Brass (DH4)

PBT = Polybutyleneterephthalate • PPS = Polyphenylene Sulphide



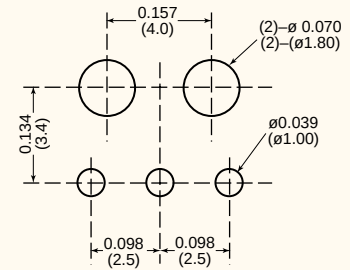


Dimensions inches (mm)



PCB Layout inches (mm)

Tolerance: ±0.002 (±0.05)
(TOP VIEW)



Mounting

Recommended mounting screw: M1.6.
Recommended torque: 9.81 cN•M
(1.0 kgf•cm). Recommended use of
a flat washer and a spring washer
for locking.

Actuator Specifications

Actuator Type	Switch Type	Maximum Operating Force (gms.)	Maximum Pre-Travel inches (mm)	Operating Point inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)
AA		90	0.008 (0.2)	0.220±0.006 (5.6±0.15)	0.004 (0.1)	0.003 (0.07)
LA		50	0.051 (1.3)	0.264±0.020 (6.7±0.5)	0.012 (0.3)	0.024 (0.6)

Ordering Information

Series/Prefix	Code	Contact Configuration
DH	3	C
		C SPDT

Code	Current Rating
3	50 to 300mA@30VDC
4	5 to 50mA@30VDC

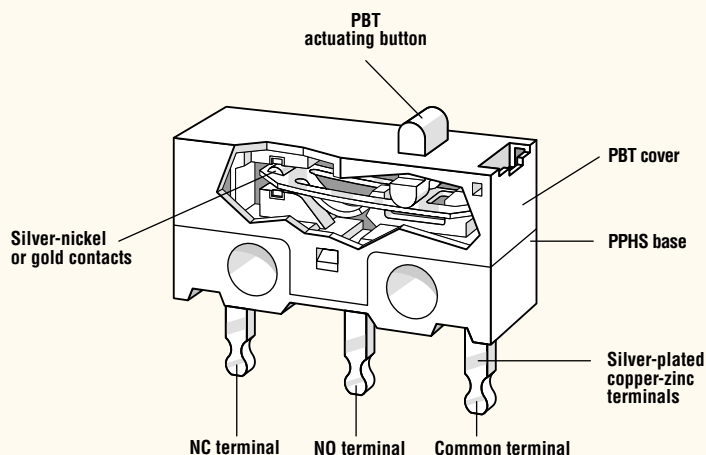
Code	Terminal Type inches (mm)	Terminal Configuration
B1	0.051 x 0.122 x 0.020 (1.3 x 3.1 x 0.5) Solder, Straight	
C4	0.025 x 0.122 x 0.020 (0.6 x 3.1 x 0.5) PCB, Straight	
C5	0.025 x 0.122 x 0.020 (0.6 x 3.1 x 0.5) PCB, RH Side	
C6	0.025 x 0.122 x 0.020 (0.6 x 3.1 x 0.5) PCB, LH Side	

Code	Actuator Type
AA	Button
LA	Simulated Roller

SUBMINIATURE DG Series

Features

- Small dimensions, just 0.504" x 0.228" x 0.256" (12.8mm x 5.8mm x 6.5mm)
- Depending on model, contact rating is suitable for low switched currents and voltages for light-current applications with loads of up to 3 amps 125VAC
- Available with or without auxiliary actuator
- Can be fitted to circuit boards in upright position or horizontally with terminals on left or right
- Mechanical life: min. 1 x 10⁶ operations (depending on model)



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load According to UL (Min. Operations)
DG1	N/A	3A, 125VAC; 2A, 30VDC	6,000
DG2	N/A	0.05A, 30VDC	6,000
DG4	N/A	1A, 125VAC; 1A, 30VDC	6,000

Specifications

Electrical

Temperature Rating: -25 °C to +85 °C

Flammability Rating: UL9V-O

Materials

Base: PPHS

Cover: PBT

Actuator: PBT

Auxiliary Actuator: Stainless Steel

Terminals: Silver-Plated Brass

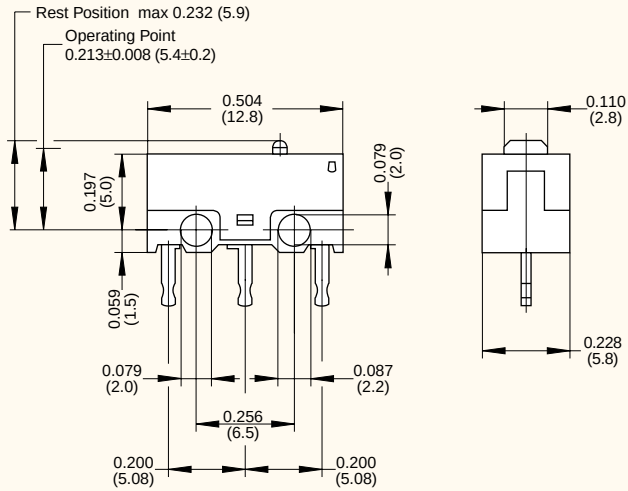
Contacts: Silver Alloy (DG1, DG4)
Gold Flash, Gold (DG2)

PBT = Polybutyleneterephthalate • PPHS = Polyphenylene sulphide

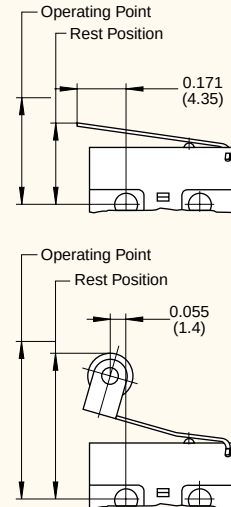




Dimensions inches (mm)

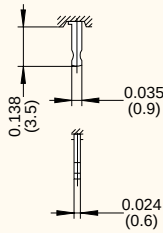


Auxiliary Actuators inches (mm)

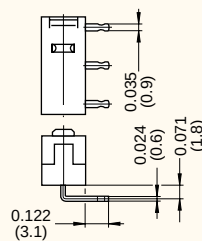


Terminal Options inches (mm)

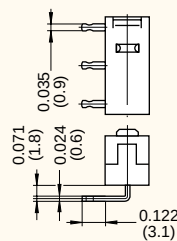
PCB Terminals Straight



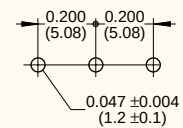
PCB Terminals RH Side



PCB Terminals LH Side



Drilling Pattern



Actuator Specifications

Actuator Type	Switch Type	Maximum Operating Force (gms.)		Maximum Pre-Travel inches (mm)	Operating Point inches (mm)	Maximum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Max. Rest Position inches (mm)
		DG1, DG2 (B)	DG2, DG4 (C)					
AA		140	75	0.020 (0.51)	0.213±0.008 (5.41±0.20)	0.008 (2.20)	0.007 (0.18)	—
LA		45	30	0.071 (1.80)	0.268+0.031/-0.016 (6.81+0.79/-0.41)	0.022 (0.55)	0.020 (0.51)	0.196 (4.98)
RA		60	35	0.059 (1.50)	0.488±0.020 (12.40±0.51)	0.022 (0.55)	0.020 (0.51)	0.322 (8.18)

Ordering Information

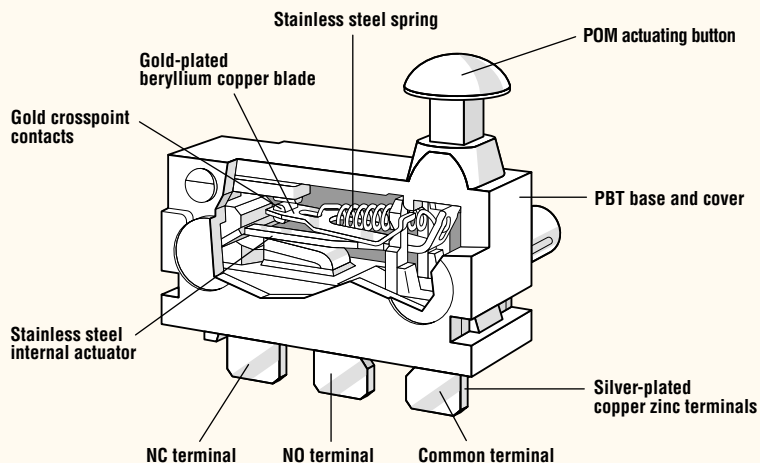
DG		1		3		B		1		AA	
Series/Prefix		Code		Contact Configuration		Code		Button Color/ Operating Force		Code	
		3		SPDT		B		Grey / 140 grams*		AA	
						C		Black / 75 grams**		LA	
										LB	
										LC	
										RA	

SUBMINIATURE

DR Series

Features

- Switch with mushroom or pan-head actuator for a wide variety of control applications
- Protection against dust complying with IP40
- Models available for operating temperatures up to 105°C
- Rated for 5mA@12VDC or 2A@12VDC
- Auxiliary actuator on request
- High contact stability thanks to gold alloy crosspoint contacts
- Mechanical life: min. 1 x 10⁶ operations
- Various options available for connecting



Specifications

Electrical

Temperature Rating:	-40°C to +85°C
Flammability Rating:	N/A

Materials

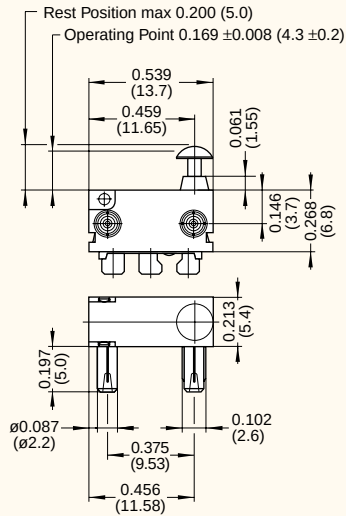
Housing:	PBT
Actuator:	POM (+85°C)
Auxiliary Actuator:	Stainless Steel
Internal Actuator:	Stainless Steel
Spring:	Stainless Steel
Terminals:	Silver-Plated Copper-Zinc
Contacts:	Gold Crosspoint
Moving Blade:	Gold-Plated Beryllium Copper

PBT = Polybutyleneterephthalate • POM = Polyacetal

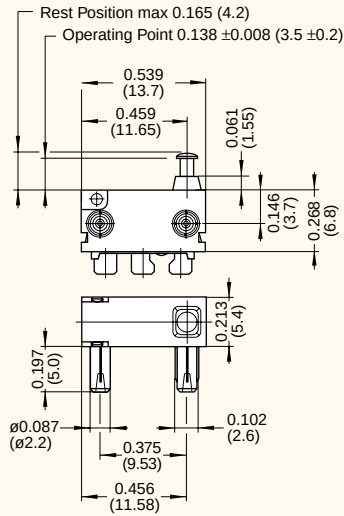


Dimensions inches (mm)

Mushroom Actuator



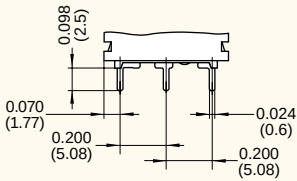
Pan-head Actuator



Terminal Options inches (mm)

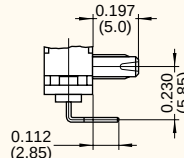
PCB Terminals — Straight

0.024 x 0.020 (0.6 x 0.5)



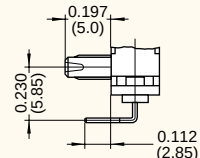
PCB Terminals RH Side with Location Pins

0.024 x 0.020 (0.6 x 0.5)



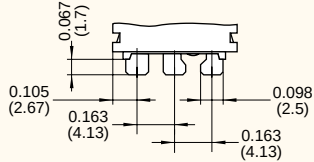
PCB Terminals LH Side with Location Pins

0.024 x 0.020 (0.6 x 0.5)



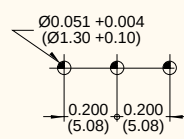
Solder Terminals

0.098 x 0.020 (2.5 x 0.5)

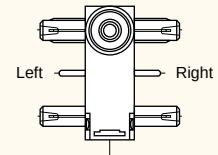


Drilling Patterns for PCB Terminals

(Side and Underside)
0.024 x 0.020 (0.6 x 0.5)



Top-down View of Lateral Terminals



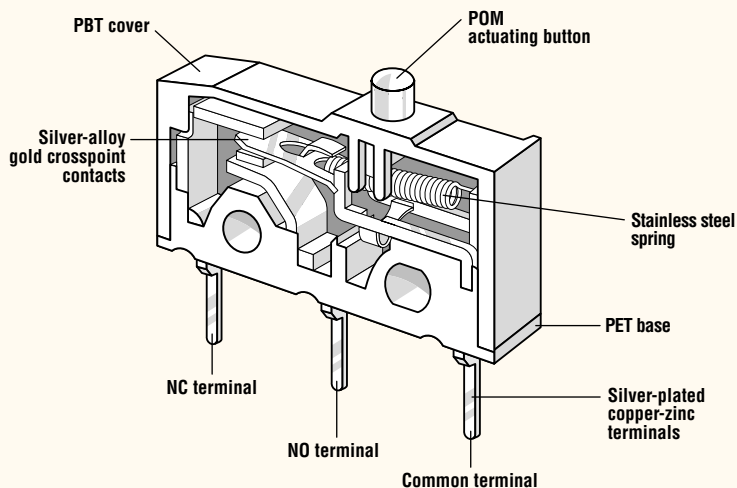
Ordering Information

DR		1		P		BR AO	
Series/Prefix				Code	Actuator Shape	Code	Actuator Type
				P	Mushroom	AO	without Auxiliary Actuator
				R	Pan-head		
Code	Current Rating						
1	0.005A@12VDC or 2A@12VDC						
Code	Terminal Type	inches (mm)					
AN	0.098 x 0.020 (2.5 x 0.5)	Solder w/o Pins					
AL	0.098 x 0.020 (2.5 x 0.5)	Solder with LH Pins					
AR	0.098 x 0.020 (2.5 x 0.5)	Solder with RH Pins					
BN	0.024 x 0.020 (0.6 x 0.5)	PCB, Straight w/o Pins					
BL	0.024 x 0.020 (0.6 x 0.5)	PCB, Straight with LH Pins					
BR	0.024 x 0.020 (0.6 x 0.5)	PCB, Straight with RH Pins					
CR	0.024 x 0.020 (0.6 x 0.5)	PCB, RH Side with RH Pins					
DL	0.024 x 0.020 (0.6 x 0.5)	PCB, LH Side with LH Pins					

SUBMINIATURE DB Series

Features

- High-precision switch with high repeat accuracy
- Models available for operating temperatures up to 120°C
- Rated for currents up to 10 amp at 250VAC
- Range of auxiliary actuators available (can also be retrofitted); two mounting positions
- Variety of contact materials available to suit your application
- Mechanical life: up to 15×10^6 operations
- Wide variety of terminal types available
- Numerous approvals



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to EN (Min. Operations)	According to UL (Min. Operations)
DB1	6A, 250V~	5A, 125/250VAC	10,000	6,000
DB2	10(1.5)A, 250V~	10.1A, 125/250VAC; 1/4HP, 125VAC	10,000	6,000
DB3	0.1A, 250V~	0.1A, 125/250VAC	50,000	6,000
DB5*	1A, 250V~	1A, 125/250VAC	50,000	6,000
DB6*	6A, 250V~	5A, 125/250VAC	50,000	6,000
DB7*	10(1.5A), 400V~	10.1A, 125/250VAC; 1/4HP, 125VAC	50,000	6,000

*85°C vs. T85.

Specifications

Electrical

Temperature Rating:	-40°C to +85°C / +120°C
Flammability Rating:	UL94V-O (PBT, PET) UL94HB (POM)

Materials

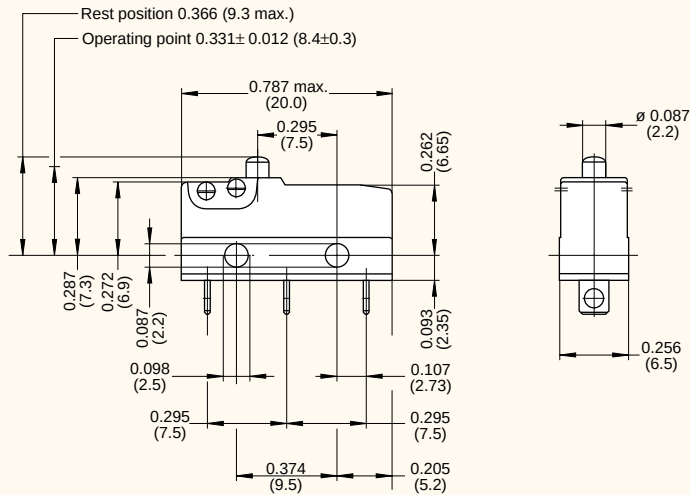
Base:	PET
Cover:	PBT
Actuator:	PBT, POM
Auxiliary Actuator:	Stainless Steel or Plastic
Terminals:	Silver-Plated Copper-Zinc
Contacts:	Silver Alloy Gold Crosspoint

PBT = Polybutyleneterephthalate • PET = Polyethyleneterephthalate • POM = Polyacetal



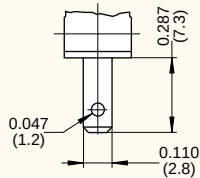


Dimensions inches (mm)

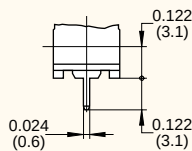


Terminal Options inches (mm)

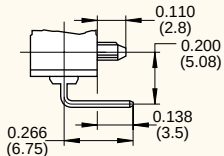
QC Terminals
0.110 x 0.020 (2.8 x 0.5)



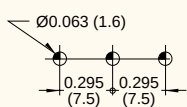
PCB Terminals – Straight
0.036 x 0.020 (0.6 x 0.5)



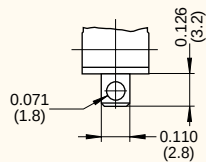
**PCB Terminals
RH Side with Location Pins**
0.024 x 0.020 (0.6 x 0.5)



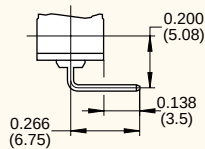
**Drilling Patterns
for PCB Terminals**
0.051 x 0.020 (1.3 x 0.5)



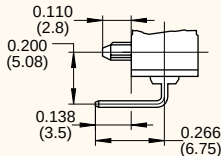
Solder Terminals – Short



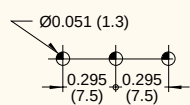
**PCB Terminals
RH Side w/o Location Pins**
0.024 x 0.020 (0.6 x 0.5)



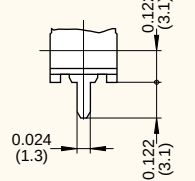
**PCB Terminals
LH Side with Location Pins**
0.024 x 0.020 (0.6 x 0.5)



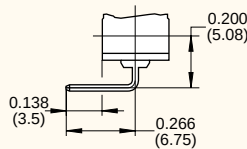
**Drilling Patterns
for PCB Terminals
(Straight/Lateral
w/o Location Pins)**
0.024 x 0.020 (0.6 x 0.5)



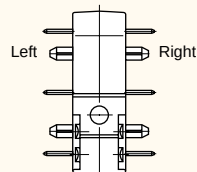
PCB Terminals – Straight
0.236 x 0.020 (1.3 x 0.5)



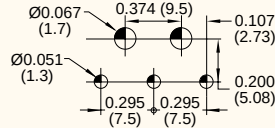
**PCB Terminals
LH Side w/o Location Pins**
0.024 x 0.020 (0.6 x 0.5)



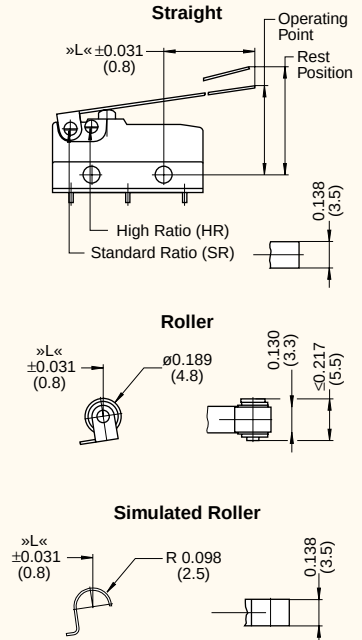
**Top-down View
of Lateral Terminals**



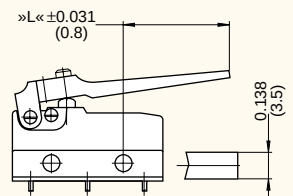
**Drilling Patterns
for PCB Terminals
(Lateral with Location Pins)**
0.024 x 0.020 (0.6 x 0.5)



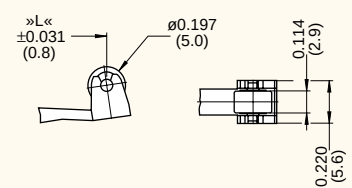
Auxiliary Actuator inches (mm)



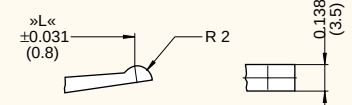
Straight – Plastic



Roller – Plastic



Simulated Roller – Plastic



Contact Ratings at Direct Voltage

Switching Voltage	Switched Current Resistive Load		Inductive Load L/R=3ms	
	DB1	DB2	DB1	DB2
12V	6A	10A	6A	10A
24V	3A	5A	2A	4A
60V	1A	1A	0.5A	0.5A
110V	0.5A	0.5A	0.2A	0.2A
220V	0.25A	0.25A	0.1A	0.1A

Actuator Specifications — Standard Ratio

Actuator Code	Switch Type	Maximum Operating Force (gms.)	Maximum Pre-Travel inches (mm)	Operating Point inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Max. Rest Position inches (mm)	Actuation Length inches (mm)
AA 	DB5	70	0.039 (1.0)	0.331±0.012 (8.4±0.3)	0.024 (0.6)	0.004 (0.10)	0.366 (9.3)	—
	DB1/3	150	0.039 (1.0)	0.331±0.012 (8.4±0.3)	0.024 (0.6)	0.004 (0.10)	0.366 (9.3)	—
	DB6	150	0.039 (1.0)	0.331±0.012 (8.4±0.3)	0.024 (0.6)	0.006 (0.15)	0.366 (9.3)	—
	DB2	250	0.039 (1.0)	0.331±0.012 (8.4±0.3)	0.024 (0.6)	0.004 (0.10)	0.366 (9.3)	—
	DB7	280	0.039 (1.0)	0.331±0.012 (8.4±0.3)	0.024 (0.6)	0.006 (0.15)	0.366 (9.3)	—
BA 	DB5	70	0.039 (1.0)	0.331±0.012 (8.4±0.3)	0.024 (0.6)	0.004 (0.10)	0.366 (9.3)	—
	DB1/3	150	0.039 (1.0)	0.331±0.012 (8.4±0.3)	0.024 (0.6)	0.004 (0.10)	0.366 (9.3)	—
	DB6	250	0.039 (1.0)	0.331±0.012 (8.4±0.3)	0.024 (0.6)	0.006 (0.15)	0.366 (9.3)	—
	DB2	250	0.039 (1.0)	0.331±0.012 (8.4±0.3)	0.024 (0.6)	0.004 (0.10)	0.366 (9.3)	—
	DB7	280	0.039 (1.0)	0.331±0.012 (8.4±0.3)	0.024 (0.6)	0.006 (0.15)	0.366 (9.3)	—
<i>Auxiliary actuator, rear-mounted (RM)</i>								
LB 	DB5	30	0.157 (4.0)	0.421±0.051 (10.7±1.3)	0.079 (2.0)	0.020 (0.5)	0.551 (14.0)	—
	DB1/3	60	0.157 (4.0)	0.421±0.051 (10.7±1.3)	0.079 (2.0)	0.020 (0.5)	0.551 (14.0)	—
	DB6	60	0.157 (4.0)	0.421±0.051 (10.7±1.3)	0.079 (2.0)	0.030 (0.75)	0.551 (14.0)	0.189 (4.8)
	DB2	100	0.177 (4.5)	0.421±0.063 (10.7±1.6)	0.059 (1.5)	0.028 (0.70)	0.551 (14.0)	—
	DB7	115	0.177 (4.5)	0.421±0.063 (10.7±1.6)	0.059 (1.5)	0.030 (0.75)	0.551 (14.0)	—
LC 	DB5	25	0.177 (4.5)	0.437±0.059 (11.1±1.5)	0.079 (2.0)	0.024 (0.6)	0.591 (15.0)	—
	DB1/3	50	0.177 (4.5)	0.437±0.059 (11.1±1.5)	0.079 (2.0)	0.024 (0.6)	0.591 (15.0)	—
	DB6	50	0.177 (4.5)	0.437±0.059 (11.1±1.5)	0.079 (2.0)	0.047 (1.2)	0.591 (15.0)	0.276 (7.0)
	DB2	85	0.197 (5.0)	0.437±0.071 (11.1±1.8)	0.059 (1.5)	0.039 (1.0)	0.591 (15.0)	—
	DB7	100	0.197 (5.0)	0.437±0.071 (11.1±1.8)	0.059 (1.5)	0.047 (1.2)	0.591 (15.0)	—
LD 	DB5	9	0.591 (15.0)	0.512±0.138 (13.0±3.5)	0.157 (4.0)	0.177 (4.5)	1.063 (27.0)	—
	DB1/3	18	0.591 (15.0)	0.512±0.138 (13.0±3.5)	0.157 (4.0)	0.177 (4.5)	1.063 (27.0)	1.654 (42.0)
	DB6	18	0.591 (15.0)	0.512±0.138 (13.0±3.5)	0.157 (4.0)	0.268 (6.8)	1.063 (27.0)	—
	DB2/7	—	—	—	—	—	—	on request
SB 	DB5	30	0.157 (4.0)	0.630±0.051 (16.0±1.3)	0.079 (2.0)	0.020 (0.5)	0.748 (19.0)	—
	DB1/3	65	0.157 (4.0)	0.630±0.051 (16.0±1.3)	0.079 (2.0)	0.020 (0.5)	0.748 (19.0)	—
	DB6	65	0.157 (4.0)	0.630±0.051 (16.0±1.3)	0.079 (2.0)	0.043 (1.1)	0.748 (19.0)	0.098 (2.5)
	DB2	110	0.177 (4.5)	0.630±0.063 (16.0±1.6)	0.059 (1.5)	0.028 (0.7)	0.748 (19.0)	—
	DB7	125	0.177 (4.5)	0.630±0.063 (16.0±1.6)	0.059 (1.5)	0.043 (1.1)	0.748 (19.0)	—
SC 	DB5	25	0.177 (4.5)	0.646±0.059 (16.4±1.5)	0.079 (2.0)	0.024 (0.6)	0.787 (20.0)	—
	DB1/3	55	0.177 (4.5)	0.646±0.059 (16.4±1.5)	0.079 (2.0)	0.024 (0.6)	0.787 (20.0)	—
	DB6	55	0.177 (4.5)	0.646±0.059 (16.4±1.5)	0.079 (2.0)	0.047 (1.2)	0.787 (20.0)	0.185 (4.7)
	DB2	95	0.197 (5.0)	0.646±0.071 (16.4±1.8)	0.059 (1.5)	0.039 (1.0)	0.787 (20.0)	—
	DB7	110	0.197 (5.0)	0.646±0.071 (16.4±1.8)	0.059 (1.5)	0.047 (1.2)	0.787 (20.0)	—
SD 	DB5	9	0.591 (15.0)	0.720±0.138 (18.3±3.5)	0.157 (4.0)	0.177 (4.5)	1.260 (32.0)	—
	DB1/3	20	0.591 (15.0)	0.720±0.138 (18.3±3.5)	0.157 (4.0)	0.177 (4.5)	1.260 (32.0)	1.563 (39.7)
	DB6	20	0.591 (15.0)	0.720±0.138 (18.3±3.5)	0.157 (4.0)	0.268 (6.8)	1.260 (32.0)	—
	DB2/7	—	—	—	—	—	—	on request
RB 	DB5	30	0.157 (4.0)	0.622±0.051 (15.8±1.3)	0.079 (2.0)	0.020 (0.5)	0.748 (19.0)	—
	DB1/3	65	0.157 (4.0)	0.622±0.051 (15.8±1.3)	0.079 (2.0)	0.020 (0.5)	0.748 (19.0)	—
	DB6	65	0.157 (4.0)	0.622±0.051 (15.8±1.3)	0.079 (2.0)	0.030 (0.75)	0.748 (19.0)	0.098 (2.5)
	DB2	110	0.177 (4.5)	0.622±0.063 (15.8±1.6)	0.059 (1.5)	0.028 (0.7)	0.748 (19.0)	—
	DB7	125	0.177 (4.5)	0.622±0.063 (15.8±1.6)	0.059 (1.5)	0.030 (0.75)	0.748 (19.0)	—
RC 	DB5	25	0.177 (4.5)	0.638±0.059 (16.2±1.5)	0.079 (2.0)	0.024 (0.6)	0.787 (20.0)	—
	DB1/3	55	0.177 (4.5)	0.638±0.059 (16.2±1.5)	0.079 (2.0)	0.024 (0.6)	0.787 (20.0)	—
	DB6	55	0.177 (4.5)	0.638±0.059 (16.2±1.5)	0.079 (2.0)	0.047 (1.2)	0.787 (20.0)	0.185 (4.7)
	DB2	95	0.197 (5.0)	0.638±0.071 (16.2±1.8)	0.059 (1.5)	0.039 (1.0)	0.787 (20.0)	—
	DB7	110	0.197 (5.0)	0.638±0.071 (16.2±1.8)	0.059 (1.5)	0.047 (1.2)	0.787 (20.0)	—
RD 	DB5	9	0.591 (15.0)	0.713±0.138 (18.1±3.5)	0.157 (4.0)	0.177 (4.5)	1.260 (32.0)	—
	DB1/3	20	0.591 (15.0)	0.713±0.138 (18.1±3.5)	0.157 (4.0)	0.177 (4.5)	1.260 (32.0)	1.563 (39.7)
	DB6	20	0.591 (15.0)	0.713±0.138 (18.1±3.5)	0.157 (4.0)	0.268 (6.8)	1.260 (32.0)	—
	DB2/7	—	—	—	—	—	—	on request
WB* 	DB5	24	0.177 (4.5)	0.437±0.059 (11.1±1.5)	0.079 (2.0)	0.024 (0.6)	0.591 (15.0)	—
	DB1/3	50	0.177 (4.5)	0.437±0.059 (11.1±1.5)	0.079 (2.0)	0.024 (0.6)	0.591 (15.0)	—
	DB6	50	0.177 (4.5)	0.437±0.059 (11.1±1.5)	0.079 (2.0)	0.035 (0.9)	0.591 (15.0)	0.276 (7.0)
	DB2	85	0.177 (4.5)	0.437±0.059 (11.1±1.5)	0.079 (2.0)	0.024 (0.6)	0.591 (15.0)	—
	DB7	100	0.177 (4.5)	0.437±0.059 (11.1±1.5)	0.079 (2.0)	0.035 (0.9)	0.591 (15.0)	—
WC* 	DB5	18	0.236 (6.0)	0.480±0.071 (12.2±1.8)	0.118 (3.0)	0.031 (0.8)	0.669 (17.0)	—
	DB1/3	38	0.236 (6.0)	0.480±0.071 (12.2±1.8)	0.118 (3.0)	0.031 (0.8)	0.669 (17.0)	—
	DB6	38	0.236 (6.0)	0.480±0.071 (12.2±1.8)	0.118 (3.0)	0.047 (1.2)	0.669 (17.0)	0.551 (14.0)
	DB2	63	0.236 (6.0)	0.480±0.071 (12.2±1.8)	0.118 (3.0)	0.031 (0.8)	0.669 (17.0)	—
	DB7	75	0.236 (6.0)	0.480±0.071 (12.2±1.8)	0.118 (3.0)	0.047 (1.2)	0.669 (17.0)	—
VB* 	DB5	25	0.177 (4.5)	0.469±0.055 (11.9±1.4)	0.079 (2.0)	0.024 (0.6)	0.591 (15.0)	—
	DB1/3	55	0.177 (4.5)	0.469±0.055 (11.9±1.4)	0.079 (2.0)	0.024 (0.6)	0.591 (15.0)	—
	DB6	55	0.177 (4.5)	0.469±0.055 (11.9±1.4)	0.079 (2.0)	0.035 (0.9)	0.591 (15.0)	0.220 (5.6)
	DB2	90	0.177 (4.5)	0.469±0.055 (11.9±1.4)	0.079 (2.0)	0.024 (0.6)	0.591 (15.0)	—
	DB7	105	0.177 (4.5)	0.469±0.055 (11.9±1.4)	0.079 (2.0)	0.035 (0.9)	0.591 (15.0)	—
ZB* 	DB5	25	0.177 (4.5)	0.630±0.055 (16.0±1.4)	0.059 (1.5)	0.024 (0.6)	0.748 (19.0)	—
	DB1/3	55	0.177 (4.5)	0.630±0.055 (16.0±1.4)	0.059 (1.5)	0.024 (0.6)	0.748 (19.0)	—
	DB6	55	0.177 (4.5)	0.630±0.055 (16.0±1.4)	0.059 (1.5)	0.035 (0.9)	0.748 (19.0)	0.205 (5.2)
	DB2	90	0.177 (4.5)	0.630±0.055 (16.0±1.4)	0.059 (1.5)	0.024 (0.6)	0.748 (19.0)	—
	DB7	105	0.177 (4.5)	0.630±0.055 (16.0±1.4)	0.059 (1.5)	0.035 (0.9)	0.748 (19.0)	—

*For 85°C only



Actuator Specifications — High Ratio

Actuator Code	Switch Type	Maximum Operating Force (gms.)	Maximum Pre-Travel inches (mm)	Operating Point inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Max. Rest Position inches (mm)	Actuation Length inches (mm)
<i>Auxiliary actuator, front-mounted (FM)</i>								
MB	DB5	12	0.354 (9.0)	0.472±0.098 (12.0±2.5)	0.138 (3.5)	0.047 (1.2)	0.709 (18.0)	—
	DB1/3	25	0.354 (9.0)	0.472±0.098 (12.0±2.5)	0.138 (3.5)	0.047 (1.2)	0.709 (18.0)	—
	DB6	25	0.354 (9.0)	0.472±0.098 (12.0±2.5)	0.138 (3.5)	0.071 (1.8)	0.709 (18.0)	0.276 (7.0)
	DB2	40	0.354 (9.0)	0.472±0.118 (12.0±3.0)	0.138 (3.5)	0.059 (1.5)	0.709 (18.0)	—
	DB7	45	0.354 (9.0)	0.472±0.118 (12.0±3.0)	0.138 (3.5)	0.071 (1.8)	0.709 (18.0)	—
MC	DB5	10	0.394 (10.0)	0.492±0.118 (12.5±3.0)	0.157 (4.0)	0.055 (1.4)	0.787 (20.0)	—
	DB1/3	22	0.394 (10.0)	0.492±0.118 (12.5±3.0)	0.157 (4.0)	0.055 (1.4)	0.787 (20.0)	—
	DB6	22	0.394 (10.0)	0.492±0.118 (12.5±3.0)	0.157 (4.0)	0.083 (2.1)	0.787 (20.0)	0.370 (9.4)
	DB2	35	0.394 (10.0)	0.492±0.138 (12.5±3.5)	0.157 (4.0)	0.071 (1.8)	0.787 (20.0)	—
	DB7	40	0.394 (10.0)	0.492±0.138 (12.5±3.5)	0.157 (4.0)	0.083 (2.1)	0.787 (20.0)	—
MD	DB5	4	1.063 (27.0)	0.709±0.315 (18.0±8.0)	0.394 (10.0)	0.236 (6.0)	1.575 (40.0)	—
	DB1/3	9	1.063 (27.0)	0.709±0.315 (18.0±8.0)	0.394 (10.0)	0.236 (6.0)	1.575 (40.0)	1.713 (43.5)
	DB6	9	1.063 (27.0)	0.709±0.315 (18.0±8.0)	0.394 (10.0)	0.354 (9.0)	1.575 (40.0)	—
	DB2/7	—	—	—	—	—	—	on request
UB	DB5	14	0.354 (9.0)	0.677±0.098 (17.2±2.5)	0.138 (3.5)	0.047 (1.2)	0.866 (22.0)	—
	DB1/3	30	0.354 (9.0)	0.677±0.098 (17.2±2.5)	0.138 (3.5)	0.047 (1.2)	0.866 (22.0)	—
	DB6	30	0.354 (9.0)	0.677±0.098 (17.2±2.5)	0.138 (3.5)	0.071 (1.8)	0.866 (22.0)	0.185 (4.7)
	DB2	50	0.354 (9.0)	0.677±0.118 (17.2±3.0)	0.138 (3.5)	0.059 (1.5)	0.866 (22.0)	—
	DB7	56	0.354 (9.0)	0.677±0.118 (17.2±3.0)	0.138 (3.5)	0.071 (1.8)	0.866 (22.0)	—
UC	DB5	12	0.394 (10.0)	0.697±0.118 (17.7±3.0)	0.157 (4.0)	0.055 (1.4)	0.945 (24.0)	—
	DB1/3	25	0.394 (10.0)	0.697±0.118 (17.7±3.0)	0.157 (4.0)	0.055 (1.4)	0.945 (24.0)	—
	DB6	25	0.394 (10.0)	0.697±0.118 (17.7±3.0)	0.157 (4.0)	0.083 (2.1)	0.945 (24.0)	0.280 (7.1)
	DB2	40	0.394 (10.0)	0.697±0.138 (17.7±3.5)	0.157 (4.0)	0.071 (1.8)	0.945 (24.0)	—
	DB7	45	0.394 (10.0)	0.697±0.138 (17.7±3.5)	0.157 (4.0)	0.083 (2.1)	0.945 (24.0)	—
UD	DB5	4	1.063 (27.0)	0.913±0.315 (23.2±8.0)	0.394 (10.0)	0.236 (6.0)	1.732 (44.0)	—
	DB1/3	9	1.063 (27.0)	0.913±0.315 (23.2±8.0)	0.394 (10.0)	0.236 (6.0)	1.732 (44.0)	1.622 (41.2)
	DB6	9	1.063 (27.0)	0.913±0.315 (23.2±8.0)	0.394 (10.0)	0.354 (9.0)	1.732 (44.0)	—
	DB2/7	—	—	—	—	—	—	on request
TB	DB5	14	0.354 (9.0)	0.669±0.098 (17.0±2.5)	0.138 (3.5)	0.047 (1.2)	0.866 (22.0)	—
	DB1/3	30	0.354 (9.0)	0.669±0.098 (17.0±2.5)	0.138 (3.5)	0.047 (1.2)	0.866 (22.0)	—
	DB6	30	0.354 (9.0)	0.669±0.098 (17.0±2.5)	0.138 (3.5)	0.071 (1.8)	0.866 (22.0)	0.185 (4.7)
	DB2	50	0.354 (9.0)	0.669±0.118 (17.0±3.0)	0.138 (3.5)	0.059 (1.5)	0.866 (22.0)	—
	DB7	56	0.354 (9.0)	0.669±0.118 (17.0±3.0)	0.138 (3.5)	0.071 (1.8)	0.866 (22.0)	—
TC	DB5	12	0.394 (10.0)	0.689±0.118 (17.5±3.0)	0.157 (4.0)	0.055 (1.4)	0.945 (24.0)	—
	DB1/3	25	0.394 (10.0)	0.689±0.118 (17.5±3.0)	0.157 (4.0)	0.055 (1.4)	0.945 (24.0)	—
	DB6	25	0.394 (10.0)	0.689±0.118 (17.5±3.0)	0.157 (4.0)	0.083 (2.1)	0.945 (24.0)	0.280 (7.1)
	DB2	40	0.394 (10.0)	0.689±0.138 (17.5±3.5)	0.157 (4.0)	0.071 (1.8)	0.945 (24.0)	—
	DB7	45	0.394 (10.0)	0.689±0.138 (17.5±3.5)	0.157 (4.0)	0.083 (2.1)	0.945 (24.0)	—
TD	DB5	4	1.063 (27.0)	0.906±0.315 (23.0±8.0)	0.394 (10.0)	0.236 (6.0)	1.732 (44.0)	—
	DB1/3	9	1.063 (27.0)	0.906±0.315 (23.0±8.0)	0.394 (10.0)	0.236 (6.0)	1.732 (44.0)	1.622 (41.2)
	DB6	9	1.063 (27.0)	0.906±0.315 (23.0±8.0)	0.394 (10.0)	0.354 (9.0)	1.732 (44.0)	—
	DB2/7	—	—	—	—	—	—	on request
GB*	DB5	10	0.394 (10.0)	0.508±0.102 (12.9±2.6)	0.118 (3.0)	0.055 (1.4)	0.787 (20.0)	—
	DB1/3	21	0.394 (10.0)	0.508±0.102 (12.9±2.6)	0.118 (3.0)	0.055 (1.4)	0.787 (20.0)	—
	DB6	21	0.394 (10.0)	0.508±0.102 (12.9±2.6)	0.118 (3.0)	0.083 (2.1)	0.787 (20.0)	0.370 (9.4)
	DB2	36	0.394 (10.0)	0.508±0.102 (12.9±2.6)	0.118 (3.0)	0.055 (1.4)	0.787 (20.0)	—
	DB7	42	0.394 (10.0)	0.508±0.102 (12.9±2.6)	0.118 (3.0)	0.083 (2.1)	0.787 (20.0)	—
GC*	DB5	7	0.512 (13.0)	0.571±0.142 (14.5±3.6)	0.157 (4.0)	0.071 (1.8)	0.945 (24.0)	—
	DB1/3	16	0.512 (13.0)	0.571±0.142 (14.5±3.6)	0.157 (4.0)	0.071 (1.8)	0.945 (24.0)	—
	DB6	16	0.512 (13.0)	0.571±0.142 (14.5±3.6)	0.157 (4.0)	0.083 (2.1)	0.945 (24.0)	0.638 (16.2)
	DB2	26	0.512 (13.0)	0.571±0.142 (14.5±3.6)	0.157 (4.0)	0.071 (1.8)	0.945 (24.0)	—
	DB7	30	0.512 (13.0)	0.571±0.142 (14.5±3.6)	0.157 (4.0)	0.094 (2.4)	0.945 (24.0)	—
HB*	DB5	11	0.354 (9.0)	0.531±0.098 (13.5±2.5)	0.098 (2.5)	0.055 (1.4)	0.787 (20.0)	—
	DB1/3	23	0.354 (9.0)	0.531±0.098 (13.5±2.5)	0.098 (2.5)	0.055 (1.4)	0.787 (20.0)	—
	DB6	23	0.354 (9.0)	0.531±0.098 (13.5±2.5)	0.098 (2.5)	0.083 (2.1)	0.787 (20.0)	0.311 (7.9)
	DB2	29	0.354 (9.0)	0.531±0.098 (13.5±2.5)	0.098 (2.5)	0.055 (1.4)	0.787 (20.0)	—
	DB7	45	0.354 (9.0)	0.531±0.098 (13.5±2.5)	0.098 (2.5)	0.083 (2.1)	0.787 (20.0)	—
OB*	DB5	11	0.354 (9.0)	0.693±0.098 (17.6±2.5)	0.079 (2.0)	0.055 (1.4)	0.906 (23.0)	—
	DB1/3	23	0.354 (9.0)	0.693±0.098 (17.6±2.5)	0.079 (2.0)	0.055 (1.4)	0.906 (23.0)	—
	DB6	23	0.354 (9.0)	0.693±0.098 (17.6±2.5)	0.079 (2.0)	0.083 (2.1)	0.906 (23.0)	0.287 (7.3)
	DB2	39	0.354 (9.0)	0.693±0.098 (17.6±2.5)	0.079 (2.0)	0.055 (1.4)	0.906 (23.0)	—
	DB7	45	0.354 (9.0)	0.693±0.098 (17.6±2.5)	0.079 (2.0)	0.083 (2.1)	0.906 (23.0)	—

*For 85°C only

Ordering Information

DB

1

Series/Prefix

Code	UL Rating 1054	EN 61058 Rating
1	5A,125/250VAC	6A, 250V~
2	10.1A, 125/250VAC 1/4HP, 125VAC	10(1.5)A, 250V~
3	0.1A, 125/250VAC	0.1A, 250V
5*	1A, 125/250VAC	1A, 250V
6*	5A, 125/250VAC	6A, 250V
7*	10.1A, 125/250VAC 1/4 HP, 125VAC	10 (1.5)A, 250V~

B

—

Code

Contact Configuration

+85°C Operating Temp	
E	SPST NO
F	SPST NC
G	SPDT
+120°C Operating Temp	
A	SPST NO
B	SPST NC
C	SPDT

B1

Code

Terminal Type inches (mm)

B1	0.110 x 0.020 (2.8 x 0.5) QC, Straight
A1	Solder, Short
C1	0.051 x 0.020 (1.3 x 0.5) PCB, Straight
D1	0.024 x 0.020 (0.6 x 0.5) PCB, Straight
D2	0.024 x 0.020 (0.6 x 0.5) PCB, RH Side with Location Pins
D3	0.024 x 0.020 (0.6 x 0.5) PCB, LH Side with Location Pins
D4	0.024 x 0.020 (0.6 x 0.5) PCB, RH Side
D5	0.024 x 0.020 (0.6 x 0.5) PCB, LH Side

AA

Code

Actuator Type*

AA	Spherical-head w/o Auxiliary Actuator
BA	Radius w/o Auxiliary Actuator

*For further actuators see Actuation Specifications table.

*For further actuators see Actuation Specifications table.

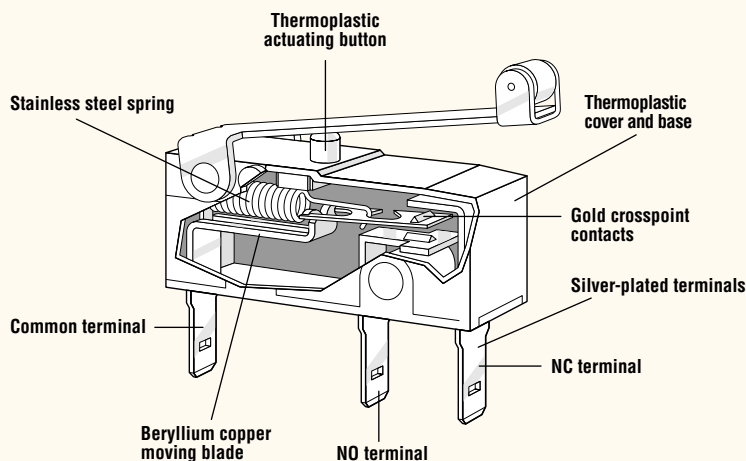
*85°C only

Specifications subject to change without notice.

SUBMINIATURE DA Series

Features

- Long life coil spring construction
- Standard gold crosspoint contacts (0.1 amp) for low level switching applications
- Silver contact low voltage DAB version also available. Consult factory.
- Five standard terminals to choose from
- Automated assembly insures high quality and reliability
- Choice of external snap-on actuators
- Custom actuators available
- VDE approved



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
DA3	0.1(0.05)A, 50VAC	0.1A, 125VAC	50,000	100,000
DAB	N/A	5A, 24VDC	N/A	6,000

Specifications

Electrical

Temperature Rating:	-40° to +85°C
Flammability Rating:	UL94V-O

Materials

Case:	Thermoplastic Polyester
Actuating Button:	Thermoplastic Acetal
Terminals:	Silver-Plated Bronze
Moving Blade:	Silver-Plated Beryllium Copper
Spring:	Copper-Coated Stainless Steel
Auxiliary Actuator:	Stainless Steel
Roller:	Stainless Steel
Contacts:	Gold Crosspoint (DA3), Silver (DAB)



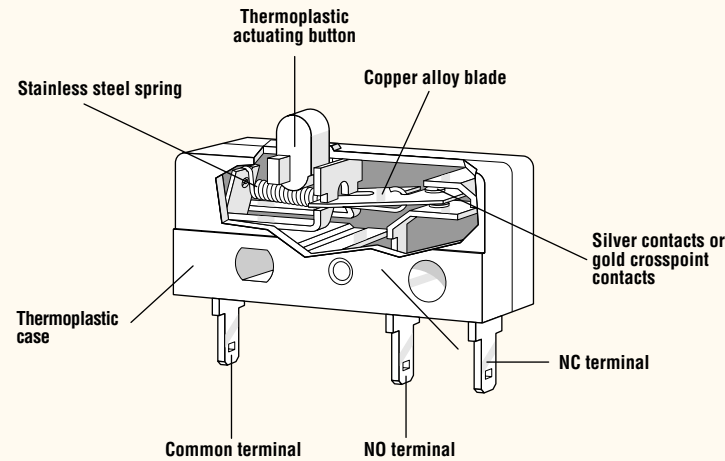
SUBMINIATURE

E Series

Features

- 4 current ratings
- Choice of actuator
- 5 terminal types
- 3 contact arrangements
- Long life coil spring mechanism
- DC ratings available upon request
- High-temperature version available

Subminiature modules take less space than individual subminiature switches fastened side-by-side. For applications requiring 2, 3, 4 or 5-circuit control in a compact space, the special molded case design helps speed assembly since there is only one part to handle and install rather than 2, 3, 4 or 5 individual switches.



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
E61	N/A	5A, 125/250VAC 5A, 30VDC (optional)	N/A	6,000*
E62	N/A	10.1A, 125/250VAC; 1/4HP, 125VAC	N/A	6,000
E63	N/A	0.1A, 125VAC 0.25A, 30VDC (optional)	N/A	6,000
E64	N/A	13A, 125VAC; 10.1A, 250VAC	N/A	6,000

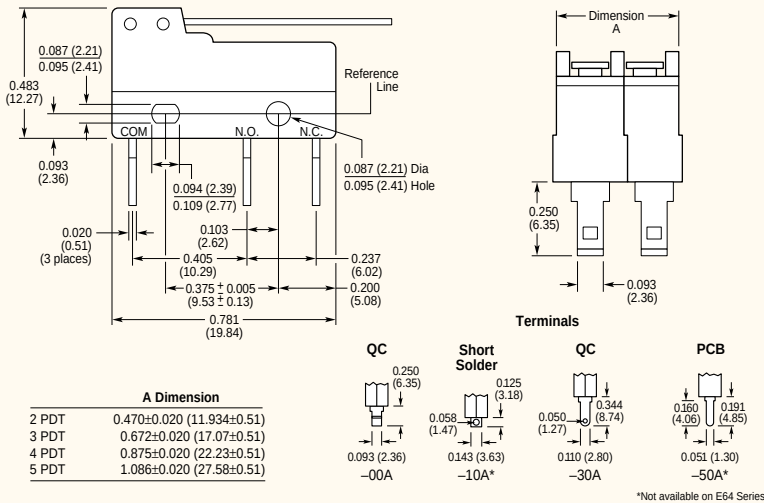
*Indicates 100K life available.

Specifications

Electrical	
Temperature Rating:	-40° to +85°C, +130° optional using thermoset material
Flammability Rating:	UL94HB
Materials	
Case:	Thermoplastic
Actuating Button:	Thermoplastic Acetal
Terminals:	Silver-Plated Commercial Bronze
Moving Blade:	Beryllium Copper
Spring:	Stainless Steel
Auxiliary Actuator:	Cold Rolled Steel (Nickel-Plated)
Contacts:	Fine Silver (except E63 — Gold Crosspoint)



Dimensions — Modules inches (mm)



Terminals — Modules

Subminiature modules are available with quick connect. 0.093" (2.362mm) wide (mates with AMP Part No. 60432-1) and 0.110" (2.794mm) wide (mates with AMP Part No. 42068-1). Also available in short solder terminal 0.143" (3.632mm) wide x 0.125" (3.175mm) long, and PCB terminal 0.051" (1.295mm) wide x 0.191" (4.851mm) long.

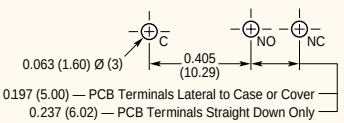
Ordering Information — Modules

Select the current rating you need. Combine the corresponding Series/Prefix number with the appropriate suffix number for the switch type and terminals you require.

*For additional actuator styles consult factory.

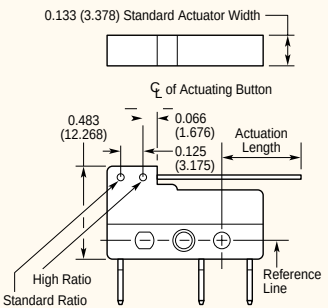
Switch Type	Terminal	Part Number Suffix			
		2PDT	3PDT	4PDT	5PDT
	0.093" (2.362mm) QC	-02HM	-03HM	-04HM	-05HM
	Solder	-12HM	-13HM	-14HM	-15HM
	0.110" (2.794mm) QC	-32HM	-33HM	-34HM	-35HM
	PCB	Consult Factory			
	0.093" (2.362mm) QC	-52HM	-53HM	-54HM	-55HM
	Solder	-62HM	-63HM	-64HM	-65HM
	0.110" (2.794mm) QC	-82HM	-83HM	-84HM	-85HM
	PCB	Consult Factory			

PCB Footprint — Modules



Actuators — Modules

Many special forms and lengths of actuators are available. Standard type integral hinged lever and roller actuators are available in choice of 2 pivot positions. Actuation lengths are dimensioned from centerline of switch mounting hole as shown.

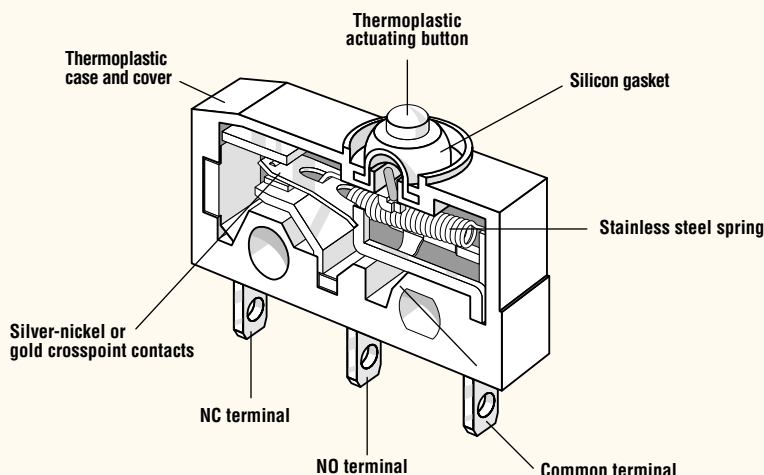


SUBMINIATURE — SEALED

DC Series

Features

- Enclosed switch complying with IP 6K7
- Silicon-free version available
- Models available for operating temperatures up to 120°C
- Rated for currents up to 10 amp at 250VAC
- Range of auxiliary actuators available (can also be retrofitted)
- Various contact materials available, depending on application
- Mechanical life: min. 1 x 10⁶ operations
- Wide variety of connection options



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to EN (Min. Operations)	According to UL (Min. Operations)
DC1	6A, 250V~	5A, 125/250VAC	10,000	6,000
DC2	10(1.5)A, 250V~	10.1A, 125/250VAC; 1/4HP, 125VAC	10,000	6,000
DC3	0.1A, 250V~	0.1A, 125/250VAC	50,000	6,000
DC4	3A, 250V~	3A, 125/250VAC	50,000	6,000

Specifications

Electrical

Temperature Rating:	-40° to +85°C / +120°C (without wire leads) -40° to +85°C / +105°C (with wire leads)
Flammability Rating:	UL94V-O (PET, PBT) UL94HB (POM)

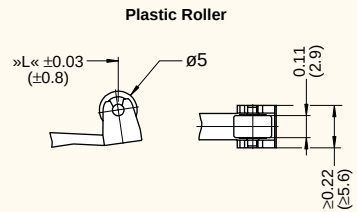
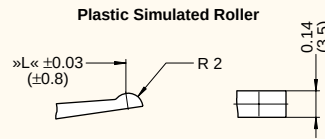
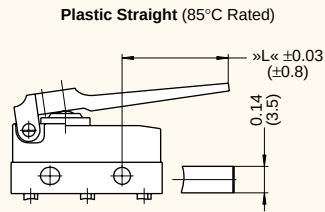
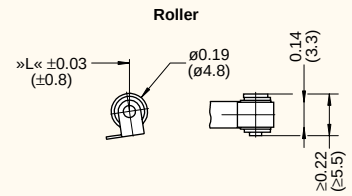
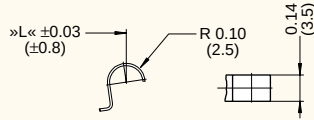
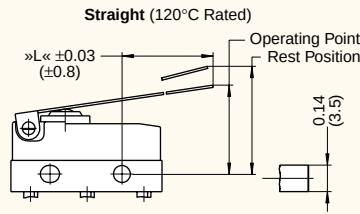
Materials

Case:	PET / PBT
Actuator:	POM (T85), PBT (T120)
Auxiliary Actuator:	Stainless Steel or Plastic
Terminals:	Silver-Plated Copper-Zinc
Contacts:	Silver Alloy (DC3 — Gold Crosspoint)

PBT = Polybutyleneterephthalate • PET = Polyethyleneterephthalate • POM = Polyacetal



Auxiliary Actuators inches (mm)

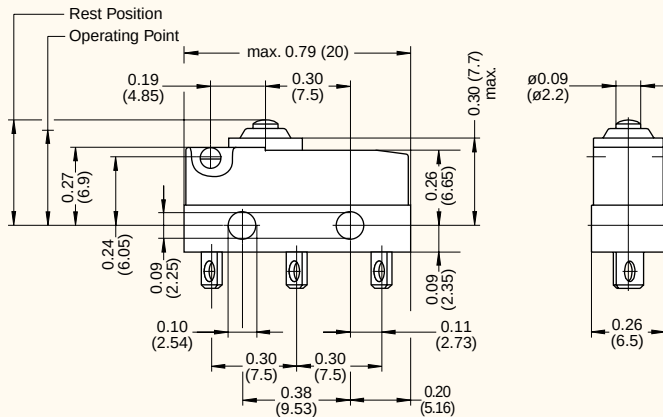


Actuator Specifications

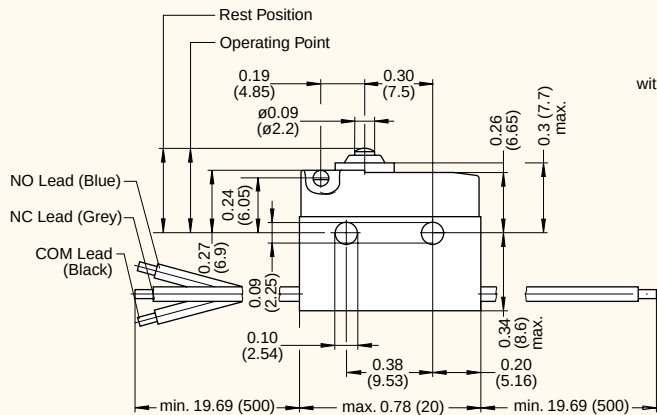
Actuator Code	Switch Type	Maximum Operating Force (cN)		Maximum Pre-Travel inches (mm)		Operating Point inches (mm)		Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)		Max. Rest Position inches (mm)	Actuation Length inches (mm)
		DC1, DC3, DC4	DC2	DC1, DC3, DC4	DC2	DC1, DC3, DC4	DC2		DC1, DC3, DC4	DC2		
AA		200	340	0.04 (1.0)	0.04 (1.0)	0.33±0.01 (8.4±0.3)	0.33±0.01 (8.4±0.3)	0.02 (0.6)	0.004 (0.10)	0.004 (0.10)	0.37 (9.3)	—
LB		80	150	0.18 (4.5)	0.20 (5.0)	0.42±0.05 (10.7±1.3)	0.42±0.06 (10.7±1.6)	0.06 (1.5)	0.02 (0.5)	0.03 (0.7)	0.55 (14.0)	0.189 (4.8)
LC		70	120	0.20 (5.0)	0.22 (5.5)	0.44±0.06 (11.1±1.5)	0.44±0.07 (11.1±1.8)	0.06 (1.5)	0.02 (0.6)	0.04 (1.0)	0.59 (15.0)	0.276 (7.0)
LD						forces and travel available upon request						1.654 (42.0)
SB		90	160	0.18 (4.5)	0.20 (5.0)	0.63±0.05 (16.0±1.3)	0.63±0.06 (16.0±1.6)	0.06 (1.5)	0.02 (0.5)	0.03 (0.7)	0.75 (19.0)	0.098 (2.5)
SC		80	130	0.20 (5.0)	0.22 (5.5)	0.65±0.06 (16.4±1.5)	0.65±0.07 (16.4±1.8)	0.06 (1.5)	0.02 (0.6)	0.04 (1.0)	0.79 (20.0)	0.185 (4.7)
SD						forces and travel available upon request						1.563 (39.7)
RB		90	160	0.18 (4.5)	0.20 (5.0)	0.62±0.05 (15.8±1.3)	0.62±0.06 (15.8±1.6)	0.06 (1.5)	0.02 (0.5)	0.03 (0.7)	0.75 (19.0)	0.098 (2.5)
RC		80	130	0.20 (5.0)	0.22 (5.5)	0.64±0.06 (16.2±1.5)	0.64±0.07 (16.2±1.8)	0.06 (1.5)	0.02 (0.6)	0.04 (1.0)	0.79 (20.0)	0.185 (4.7)
RD						forces and travel available upon request						1.563 (39.7)
WB		68	115	0.18 (4.5)	0.18 (4.5)	0.44±0.06 (11.1±1.5)	0.44±0.06 (11.1±1.5)	0.08 (2.0)	0.02 (0.6)	0.02 (0.6)	0.59 (15.0)	0.276 (7.0)
WC		50	85	0.24 (6.0)	0.24 (6.0)	0.48±0.07 (12.2±1.8)	0.48±0.07 (12.2±1.8)	0.12 (3.0)	0.03 (0.8)	0.03 (0.8)	0.67 (17.0)	0.551 (14.0)
VB		73	125	0.18 (4.5)	0.18 (4.5)	0.47±0.06 (11.9±1.4)	0.47±0.06 (11.9±1.4)	0.08 (2.0)	0.02 (0.6)	0.02 (0.6)	0.59 (15.0)	0.220 (5.6)
ZB		73	125	0.18 (4.5)	0.18 (4.5)	0.63±0.06 (16.0±1.4)	0.63±0.06 (16.0±1.4)	0.06 (1.5)	0.02 (0.6)	0.02 (0.6)	0.75 (19.0)	0.205 (5.2)



Dimensions inches (mm)



Model with Connecting Leads



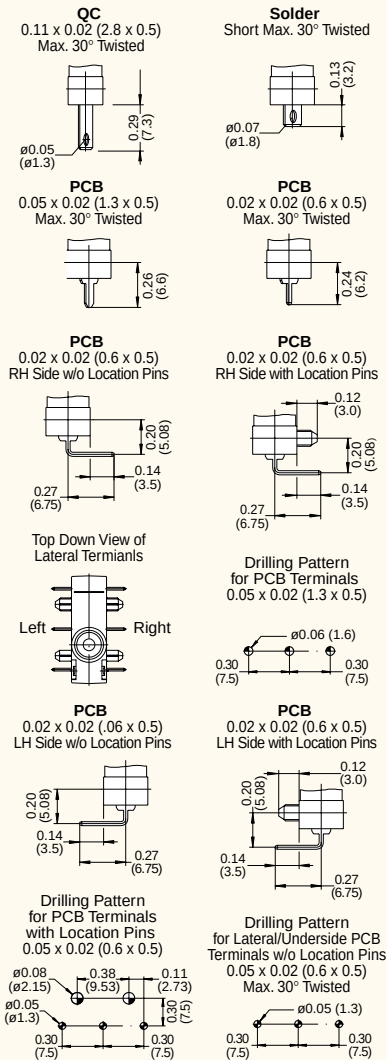
Special Model Available
with Tail Pedestal on Request

Cut-out

Type A

Type B

Terminal Options inches (mm)



Ordering Information

DC		
Series/Prefix		
Code	UL Rating	EN 61058 Rating
1	5A,125/250VAC	6A, 250V~
2	10.1A, 125/250VAC 1/4HP, 125VAC	10(1.5)A, 250V~
3	0.1A, 125/250VAC	0.1A, 250V~
4 ¹	3A, 250VAC	3A, 250V~

Contact Configuration			
+85°C Operating Temp		+105°/120°C Operating Temp	
Code		Code	
E	SPST NO	A	SPST NO
F	SPST NC	B	SPST NC
G	SPDT	C	SPDT

Notes:

Wire leads 500mm min. (approximately 20" long)

- Only available with terminal configuration 1.
- +85°C rated only.
- Only available with DC1, DC3 and DC4.
- Rating code 4 only as lead-version — leads 0.5mm².
- Wire versions only rated to +105°C.
- Only available with terminal configuration 3 or 4.

G B		
Code	Terminal Type inches (mm)	Notes
A	Short Solder	1
B	0.02" (0.5") Leads (No UL)	5, 9
C	0.03" (0.75") Leads (No UL)	5
H	0.05 x 0.02 (1.3 x 0.5) PCB	1
K	0.02 x 0.02 (0.6 x 0.5) PCB	1, 7
L	0.11 x 0.02 (2.8 x 0.5) QC	1
N	Without Leads (Type B)	6
P	Without Leads (Type A)	6
Q	Without Leads (No Cut-Out)	8
S	Welding	1
T	Leads, 20 AWG	3, 11
U	Leads, 22AWG	9, 11

Only Available in North America		
D	Leads 18 AWG (UL Only)	5, 8, 10
E	Leads 16 AWG (UL Only)	5
M	Leads 20 AWG (UL Only)	3, 5

- Only available with terminal configuration 1, 6, 7, 8 or 9.
- Only available with terminal configuration 5.
- Only available with DC3 and DC4.
- Not available with DC2.
- Not available in North America.

3 L		
Code	Actuator Type	Code
AA	Button only	—
L	Lever	—
R	Roller	—
S	Simulated Roller	—
V ²	Plastic Sim. Roller	—
W ²	Plastic Straight	—
Z ²	Plastic with Roller	—

C			
Code	Actuation Length inches (mm)	A	B
AA	—	—	—
L	—	0.189 (4.8)	0.276 (7.0)
R	—	0.098 (2.5)	0.185 (4.7)
S	—	0.098 (2.5)	0.185 (4.7)
V ²	—	0.220 (5.6)	—
W ²	—	0.276 (7.0)	0.551 (14.0)
Z ²	—	0.205 (5.2)	—

Code	Terminal Configuration
1	30° Twisted
3	Leads on Actuator Side
4	Leads on Opposite Side from Actuator
5	Leads Attached to Underside
6	PCB Terminals Right-hand Side
7	PCB Terminals Left-hand Side
8	PCB Terminals Right-hand Side with Location Pins
9	PCB Terminals Left-hand Side with Location Pins

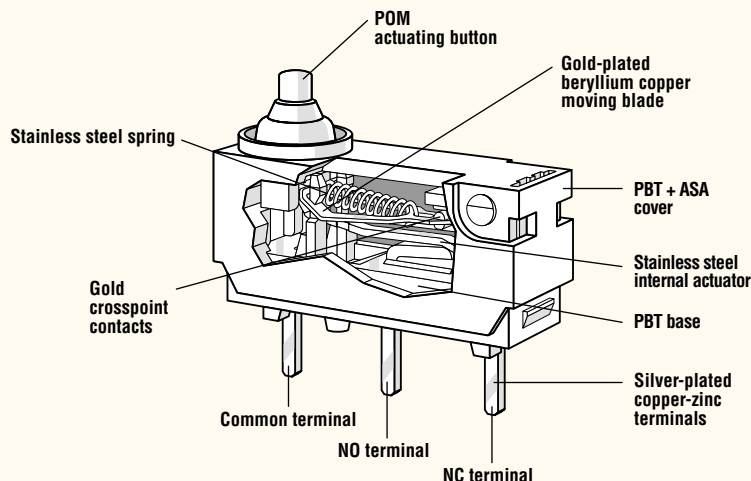
Specifications subject to change without notice.

SUBMINIATURE — SEALED

DK Series

Features

- Enclosed switch complying with IP 6K5. IP 6K7 available on request
- Very small dimensions, 0.579" x 0.213" x 0.268" (14.7mm x 5.4mm x 6.8mm)
- Models available for operating temperatures up to 105°C
- Rated for 5mA@12VDC or 2A@12VDC
- Can be actuated vertically or by auxiliary actuator
- Gold crosspoint contacts for high contact stability
- Mechanical life: min. 500,000 operations
- Wide variety of connection options, also available with leads



Specifications

Electrical

Temperature Rating:	-40°C to +85°C
Flammability Rating:	N/A

Materials

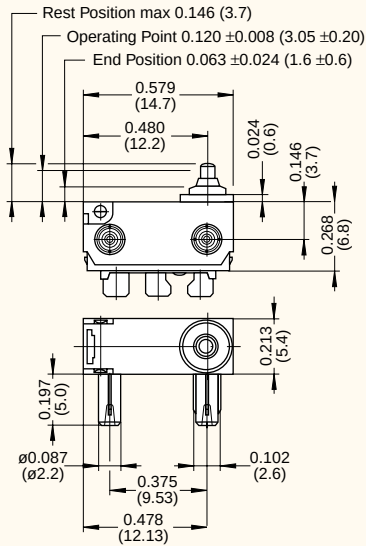
Base:	PBT
Cover:	PBT + ASA
Actuator:	POM (+85°C)
Auxiliary Actuator:	Stainless Steel
Internal Actuator:	Stainless Steel
Spring:	Stainless Steel
Moving Blade:	Gold-Plated Beryllium Copper
Terminals:	Silver-Plated Copper-Zinc
Contacts:	Gold Crosspoint
Gasket:	Silicon

ASA = Acrylonitrile-styrene-acrylicester • PBT = Polybutyleneterephthalate • POM = Polyacetal

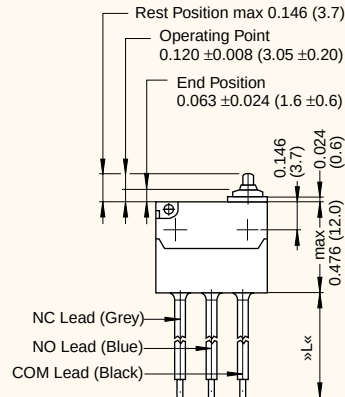




Dimensions inches (mm)

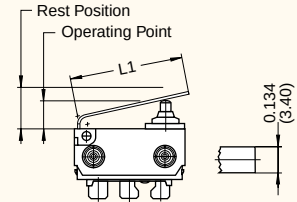


DK Sub-subminiature Switch with Leads (IP6K7 Compliant)

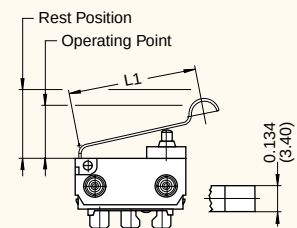


Auxiliary Actuators inches (mm)

Straight

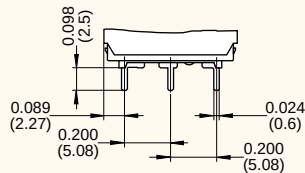


Simulated Roller

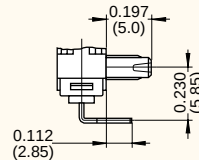


Terminal Options inches (mm)

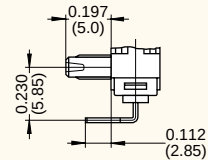
PCB Terminals — Straight 0.024 x 0.020 (0.6 x 0.5)



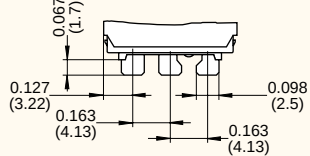
PCB Terminals RH Side with Location Pins 0.024 x 0.020 (0.6 x 0.5)



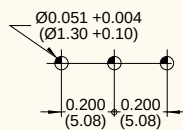
PCB Terminals LH Side with Location Pins 0.024 x 0.020 (0.6 x 0.5)



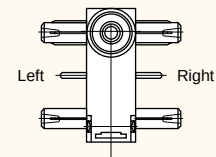
Solder Terminals 0.098 x 0.020 (2.5 x 0.5)



Drilling Patterns for PCB Terminals (Side and Underside) 0.024 x 0.020 (0.6 x 0.5)



Top-down View of Lateral Terminals



Ordering Information

DK	1	G	TR
Series/Prefix			
Code	Current Rating		
1	0.005A@12VDC or 2A@12VDC		
Code	Contact Configuration		
G	SPDT		
Version with Leads			
E	SPST NO		
F	SPST NC		
Code	Terminal Type	inches (mm)	
RN	0.098 x 0.020 (2.5 x 0.5) Solder, Straight w/o Pins		
RR	0.098 x 0.020 (2.5 x 0.5) Solder, Straight with RH Pins		
RL	0.098 x 0.020 (2.5 x 0.5) Solder, Straight with LH Pins		
SN	0.024 x 0.020 (0.6 x 0.5) PCB, Straight w/o Pins		
SR	0.024 x 0.020 (0.6 x 0.5) PCB, Straight with RH Pins		
SL	0.024 x 0.020 (0.6 x 0.5) PCB, Straight with LH Pins		
TR	0.024 x 0.020 (0.6 x 0.5) PCB, RH Side with RH Pins		
UL	0.024 x 0.020 (0.6 x 0.5) PCB, LH Side with LH Pins		
W3	9.843 (250) Leads 0.014 ² (0.35 ²) to Underside w/o Pins		
W9	9.843 (250) Leads 0.014 ² (0.35 ²) to Underside with RH Pins		
W6	9.843 (250) Leads 0.014 ² (0.35 ²) to Underside with LH Pins		
Z3	19.685 (500) Leads 0.014 ² (0.35 ²) to Underside w/o Pins		
Z9	19.685 (500) Leads 0.014 ² (0.35 ²) to Underside with RH Pins		
Z6	19.685 (500) Leads 0.014 ² (0.35 ²) to Underside with LH Pins		

A0

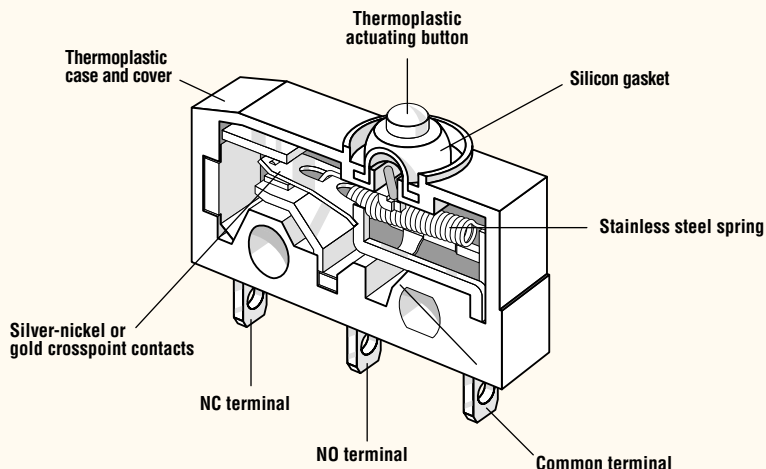
Code	Actuator Type
A0	Without Auxiliary Actuator
D1	Straight Spring-Loaded Auxiliary Actuator
E1	Simulated Roller, Spring-Loaded

SUBMINIATURE — SEALED

DCJK Series

Features

- Enclosed switch complying with IP 6K7
- Silicon-free version available
- Models available for operating temperatures up to 120°C
- Rated for currents up to 10 amp at 250VAC
- Range of auxiliary actuators available (can also be retrofitted); two mounting positions
- Wide variety of terminal types; 3 pedestal heights
- High contact stability thanks to selection of application-specific contact materials
- Mechanical life: min. 2×10^6 operations



Specifications

Electrical

Temperature Rating: -40° to +85°C / +120°C (without wire leads)
-40° to +85°C / +105°C (with wire leads)

Flammability Rating: UL94V-0 (PET)
UL94V-2 (PA)
UL94HB (POM)

Materials

Base: PET

Cover: PET/PA

Actuator: POM (85°C) / PA (120°C)

Auxiliary Actuator: Stainless Steel or Plastic

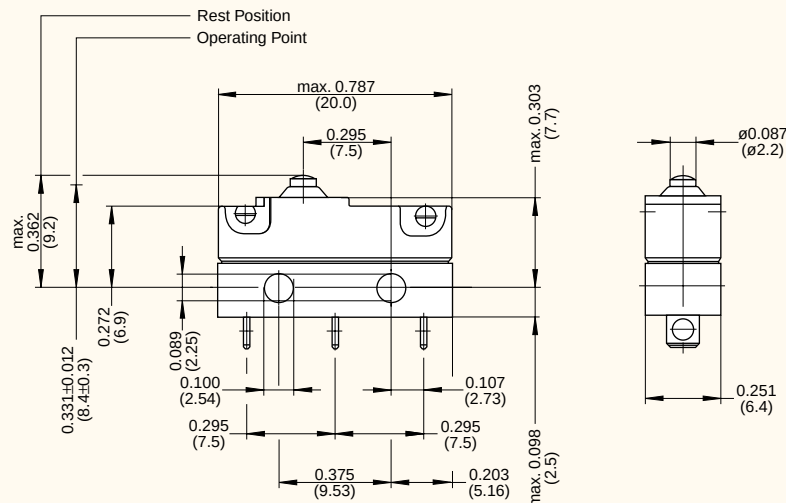
Terminals: Silver-Plated Copper-Zinc

Contacts: Silver Alloy; Silver;
Gold-Plated Silver Crosspoint;
Gold Crosspoint

PA = Polyamide • PET = Polyethyleneterephthalate • POM = Polyacetal

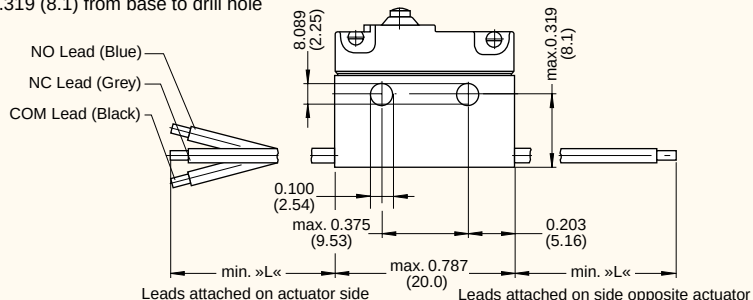


Dimensions inches (mm)

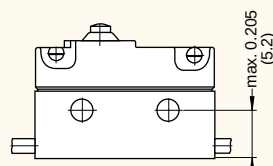


Dimensions inches (mm)

Model with Electrical Leads 0.319 (8.1) from base to drill hole



Model with Electrical Leads 0.205 (5.2) from base to drill hole



Example

Because of the huge variety of options available, there is no fully descriptive order code. Please give us details of your requirements so that we can find the right solution to suit your needs and tell you the precise order code to use.

Ordering Information

DCJK

Series/Prefix

1

Code	Contact Material
1	Silver Alloy
2	Silver
3	Gold Crosspoint
5	Gold-Plated Silver Crosspoint

2

Code	Pedestal Height
1	Short Pedestal 0.098 (2.5)
2	Medium Pedestal 0.205 (5.2)
3	Tall Pedestal 0.319 (8.1)

XX

Serial Number

Auxiliary Actuators

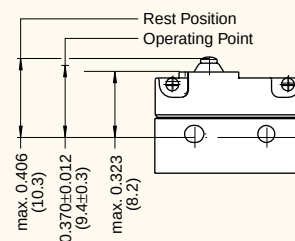
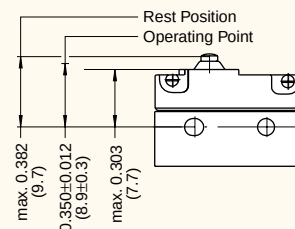
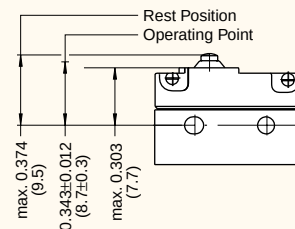
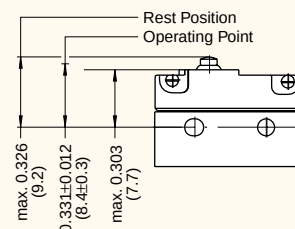
Switches in the DCJK family have two mountings for attaching auxiliary actuators. This, combined with the range of actuators available in the DC switch family and various operating points, means that a wide variety of operating forces and travel combinations is feasible.

To find the perfect fit for your requirements, please contact us.

Switching Point

Options inches (mm)

For customizing to individual requirements, switches in the DCJK family are available with four different switching points.

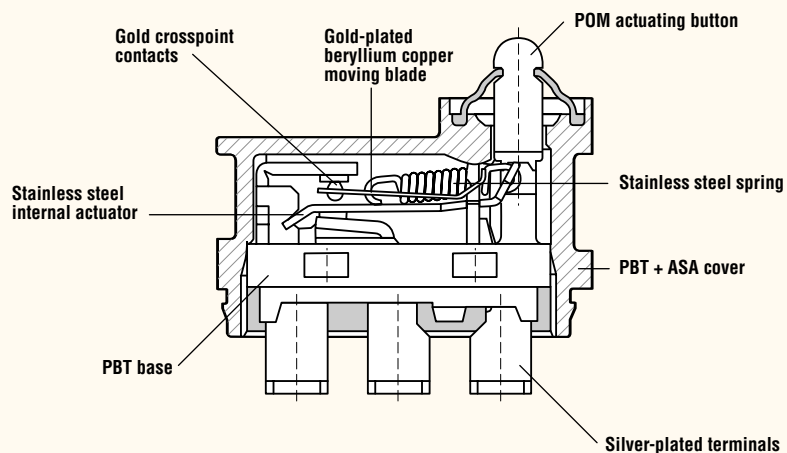


SUBMINIATURE — SEALED

DJ Series

Features

- Enclosed switch complying with IP 6K7
- Suitable for actuation at angles of up to 40°, depending on material used in sliding actuator, etc.
- Multiple location pins and locating slots make installation easy
- Very small dimensions
- Models available for operating temperatures up to 85°C
- Rated for 5mA@12VDC or 2A@12VDC
- High contact stability due to gold crosspoint contacts
- Mechanical life: min. 500,000 operations
- Wide variety of connection options



Specifications

Electrical

Temperature Rating:	-40° to +85°C
Flammability Rating:	N/A

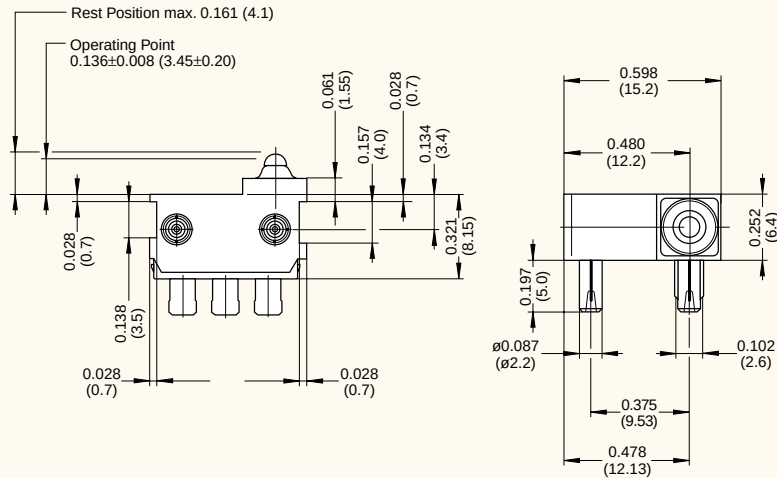
Materials

Base:	PBT
Cover:	PBT + ASA
Actuator:	POM
Internal Actuator:	Stainless Steel
Spring:	Stainless Steel
Gasket:	Silicon
Moving Blade:	Gold-Plated Beryllium Copper
Terminals:	Silver-Plated Copper-Zinc
Contacts:	Gold Crosspoint

ASA = Acrylonitrile-styrene-acrylicester • PBT = Polybutyleneterephthalate • POM = Polyacetal

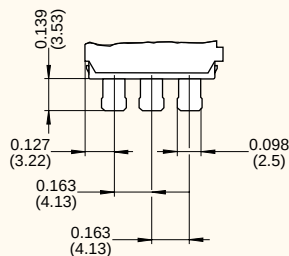


Dimensions inches (mm)

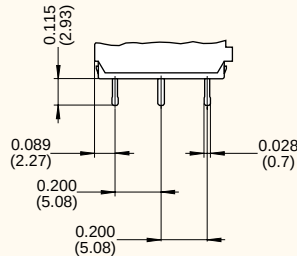


Terminal Options inches (mm)

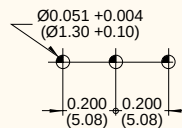
Solder Terminals
0.098 x 0.020 (2.5 x 0.5)



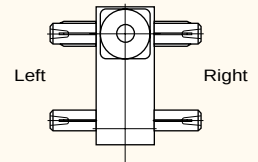
PCB Terminals
0.028 x 0.020 (0.7 x 0.5)



Drilling Pattern for PCB Terminals
0.028 x 0.020 (0.7 x 0.5)



Top-down View of Lateral Location Pins



Ordering Information

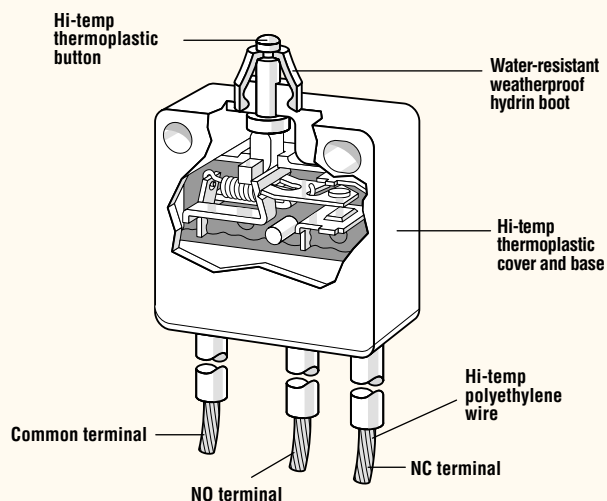
DJ	1	G	BR	AO
Series/Prefix	Code	Contact Configuration	Code	Actuator Type
	G	SPDT	AO	Without Auxiliary Actuator
Code	Current Rating	Code	Terminal Type	inches (mm)
1	0.005A@12VDC or 2A@12VDC	AN	0.098 x 0.020 (2.5 x 0.5) Solder, Straight w/o Pins	
		AL	0.098 x 0.020 (2.5 x 0.5) Solder, Straight with LH Pins	
		AR	0.098 x 0.020 (2.5 x 0.5) Solder, Straight with RH Pins	
		BN	0.028 x 0.020 (0.7 x 0.5) PCB, Straight w/o Pins	
		BL	0.028 x 0.020 (0.7 x 0.5) PCB, Straight with LH Pins	
		BR	0.028 x 0.020 (0.7 x 0.5) PCB, Straight with RH Pins	

SUBMINIATURE — SEALED

E72/E73 Series

Features

- Moisture resistant
- 3 contact arrangements
- Long life coil spring mechanism
- Choice of button or hinged actuator
- 10", 16 gauge leads attached
- Custom wire and harness designs available upon request



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
E72	N/A	10.1A, 1/4HP, 125/250VAC	N/A	6,000
E73	N/A	0.1A, 125VAC	N/A	6,000

Specifications

Electrical

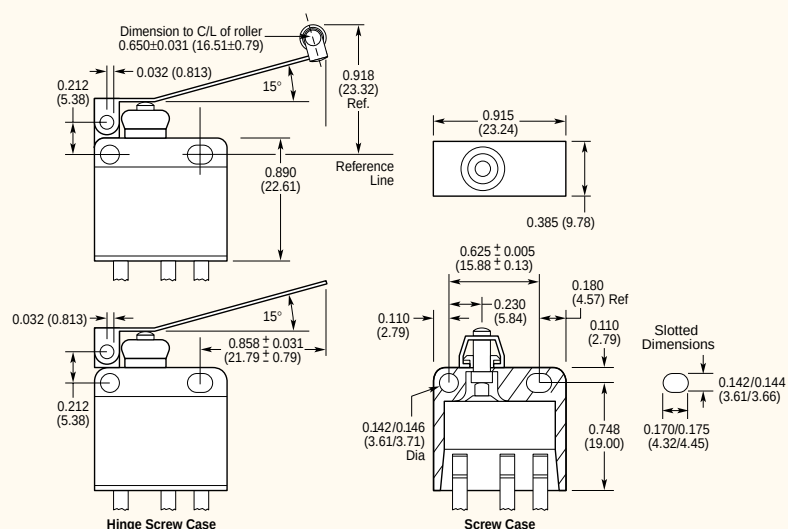
Temperature Rating:	-40° to +85°C
Flammability Rating:	UL94V-O

Materials

Case:	Hi-Temp Thermoplastic Nylon
Boot:	Hydrin
Button:	Hi-Temp Thermoplastic Nylon
Actuator:	Stainless Steel
Potting:	Macromelt Polyamide
Contacts:	Silver Alloy (E72), Gold Crosspoint (E73)



Dimensions inches (mm)



Characteristics inches (mm)

	-40AT	-40HT	-40KT
Max. Rest Position	0.390 (9.91)	0.972 (24.69)	1.041 (26.44)
Max. Pretravel	0.040 (1.02)	0.275 (6.99)	0.240 (6.10)
Operating Point	0.310 – 0.350 (7.87 – 8.99)	0.440 – 0.750 (11.18 – 19.05)	0.762 $\pm$ 0.125 (19.36 $\pm$ 3.18)
Min. Overtravel	0.035 (0.89)	0.100 (2.54)	0.125 (3.18)
Max. Movement Differential	0.004 (0.10)	0.024 (0.61)	0.025 (0.635)
Max. Operating Force	300 gms.	67 gms.	75 gms.

Mounting

Recommended screw size: #6-32 round head. Recommended torque on screw: 6 inch lbs. max.

Ordering Information

Actuator	Silver Contacts	Gold Contacts
Button	E72-40AT	E73-40AT
Lever	E72-40HT	E73-40HT
Roller	E72-40KT	E73-40KT

MINIATURE

D4 Series

Features

- 8 current ratings
- Choice of actuators
- Various terminal types
- 3 contact arrangements
- Choice of standard or light operating force
- Long-life coil spring mechanism
- Agency approved extended life versions
- ENEC/VDE approval standard on European versions
- Stackable case and cover available upon request

European Approved Versions

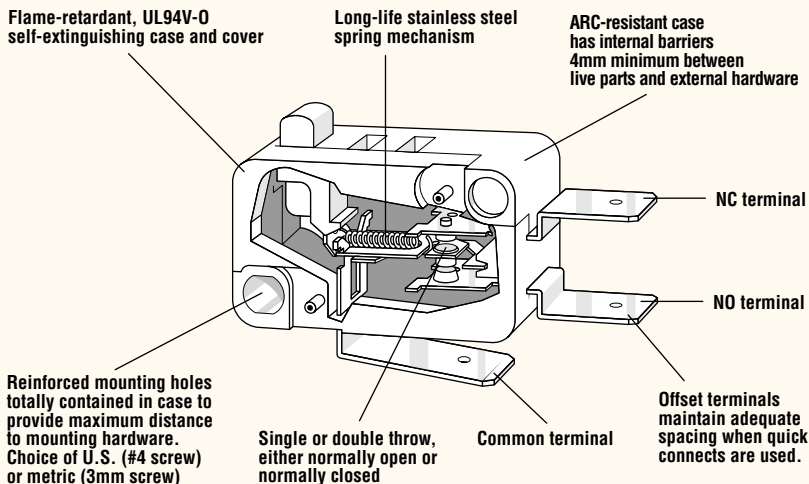
D4 series switches with metric mounting holes automatically carry ENEC approval. D4 series switches with U.S. mounting holes have optional VDE approval. Contact factory for part number. Switches with straight terminals may require insulated connectors for international approval.

Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to EN (Min. Operations)	According to UL (Min. Operations)
D40	N/A	1.0A, 125VAC	NA	6,000*
D41	0.1(0.05)A, 250V~	0.1A, 125/250VAC	50,000	6,000*
D42	3(1)A, 250V~	3A, 125/250VAC; 1/10HP, 250VAC	50,000	6,000*
D43	6(2)A, 250V~	5A, 1/4HP, 125/250VAC	50,000	6,000*
D44	10(3)A, 250V~	10A, 1/2HP, 125/250VAC	50,000	6,000*
D45	16(4)A, 250V~ 10(3)A, 400V~ (Std. force only)	15A, 1/2HP, 125/250VAC	50,000	6,000*
D48	21(8)A, 250V~	21A, 1HP, 125VAC; 2HP, 250VAC	10,000	6,000
D49	N/A	10A, 1/2HP, 125/250VAC; 6A, 30VDC	NA	6,000*

Operating life for 125°C and 150°C available upon request.

*Indicates 100K life available. Consult factory.



Specifications

Electrical

Temperature Rating: -40° to +85°C, 125°C or 150°C

Flammability Rating: UL94V-0

Materials

Case: Thermoplastic Polyester (PBT), European Versions (PET)

Actuating Button: Thermoplastic Acetal (POM), 85°C
Thermoplastic Polyester (PET), 125°C or 150°C

Auxiliary Actuator: Aluminum, Stainless Steel or Cold-Rolled Steel (Nickel-Plated)

Common Terminal: Silver-Plated Brass

NO/NC Terminals: Brass (D40, D41, D42, D43, D44, D49)
Brass (D45, European versions)
Copper (D45, US Versions)
Silver-Plated Copper (D48, US versions)
Copper (D48, European versions)

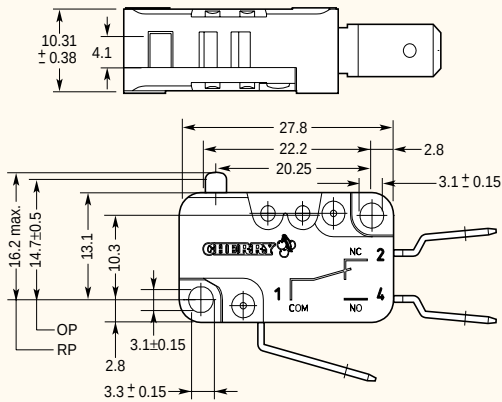
Moving Blade: Brass (D40, D41, D42, D43)
Beryllium Copper (D44, D45, D48)

Contacts: Gold Crosspoint (D40, D41)
Silver Alloy (D42, D43, D44, D45, D48, D49)

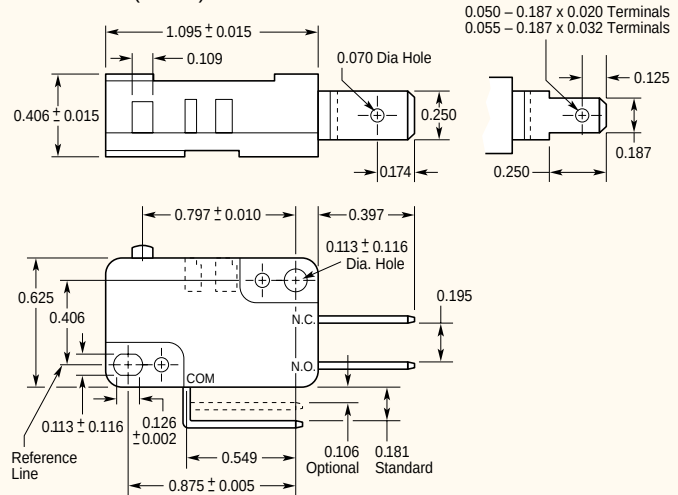


Dimensions

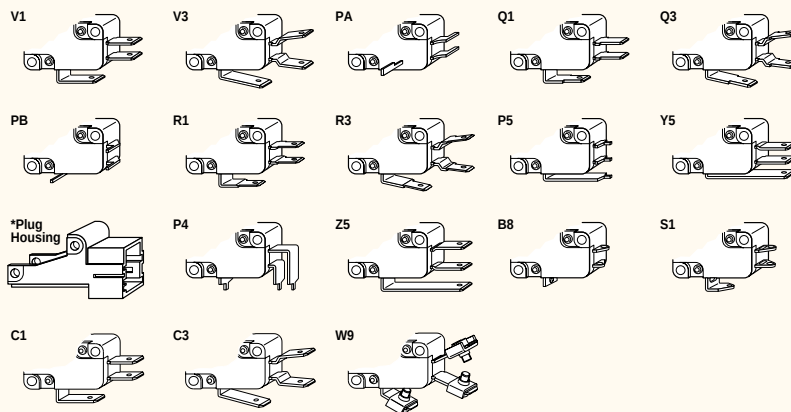
European Version (mm)



U.S. Version (inches)

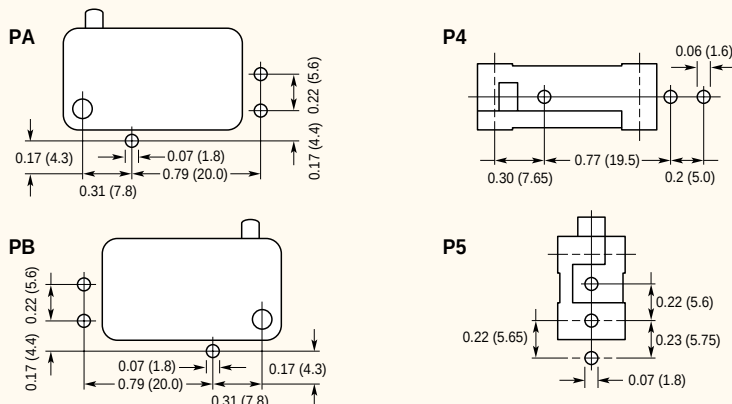


Terminals



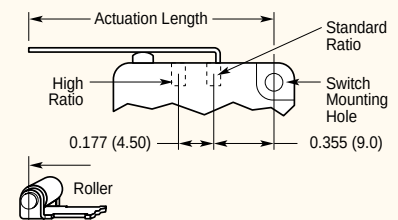
*Connector Part #623-0518 (mates with Y5 only).

Drilling Patterns for PCB Terminals



Actuators

Many special forms and lengths of actuators are available. Standard type integral hinged lever and roller actuators are available in choice of 2 mounting positions. Actuation lengths are dimensioned from centerline of switch mounting hole as shown.



EN (VDE) Identifiers

Switches with a "standard" operating force are identified by a 'Y' next to the standard model description, e.g. D43Y.

Switches with a "light" operating force are identified by an 'X' next to the standard model description, e.g. D43X.

Mounting — US Version

Recommended mounting screw size: #4-40 Round head. Recommended torque on screw: 3 inch lbs. max.

Mounting — European Version

Recommended mounting screw size: M3. Recommended torque on screw: 70N cm max.

Actuator Specifications — US Versions

Actuator Type	Switch Type	Maximum Operating Force (Gms.)							Maximum Pre-Travel inches (mm)		Operating Point inches (mm)		Minimum Over Travel inches (mm)		Max. Movement Differential inches (mm)		Actuation Length inches (mm)
		D40, D41, D42 Std / Light	D43 Std / Light	D44 Std / Light	D45 Std / Light	D48 Std / Light	D49 Std / Light		D40-D45, D49	D48	D40-D45, D49	D48	D40-D45, D49	D48	D40-D45, D49	D48	
AA		75 / 15	170 / 45	285 / 75	400 / 100	— / 120	285 / 75		0.047 (1.19)	0.070 (1.78)	0.558/0.598 (14.17/15.19)	0.537/0.557 (13.64/14.15)	0.050 (1.27)	0.040 (1.02)	0.010 (0.25)	0.010 (0.25)	—
LA		75 / 15	170 / 45	285 / 75	400 / 100	— / 183	285 / 75		0.062 (1.57)	0.063 (1.60)	0.580/0.620 (14.73/15.75)	0.578/0.618 (14.70/15.70)	0.050 (1.27)	0.031 (0.80)	0.016 (0.41)	0.011 (0.30)	0.865 (21.97)
LD*†		35 / 8	86 / 23	144 / 37	200 / 51	— / 77	144 / 37		0.125 (3.18)	0.150 (3.80)	0.555/0.645 (14.10/16.38)	0.563/0.657 (14.0/16.4)	0.085 (2.16)	0.071 (1.80)	0.030 (0.76)	0.031 (0.80)	1.40 (35.56)
MD*††		20 / 5	51 / 14	86 / 23	120 / 30	— / 46	86 / 30		0.222 (5.59)	0.252 (6.40)	0.525/0.675 (13.34/17.15)	0.535/0.661 (13.6/16.8)	0.130 (3.30)	0.126 (3.20)	0.050 (1.27)	0.051 (1.30)	1.580 (40.13)
JL*†††		17 / 3.5	38 / 10	63 / 17	90 / 22	— / 36	63 / 17		0.300 (7.62)	0.347 (8.80)	0.500/0.700 (12.70/17.78)	0.472/0.724 (12.0/18.4)	0.187 (4.75)	0.169 (4.30)	0.065 (1.65)	0.067 (1.70)	2.757 (70.03)
RA		75 / 15	170 / 45	285 / 75	400 / 100	— / —	285 / 75		0.047 (1.19)	—	0.776/0.836 (19.71/21.33)	—	0.040 (1.02)	—	0.010 (0.25)	—	0.810 (20.57)
RD		35 / 8	86 / 22	144 / 37	200 / 50	— / —	144 / 37		0.125 (3.18)	—	0.761/0.851 (19.33/21.62)	—	0.085 (2.16)	—	0.030 (0.76)	—	1.240 (34.04)
TD		25 / 5	51 / 14	86 / 22	120 / 30	— / —	86 / 22		0.200 (5.08)	—	0.731/0.881 (18.57/22.38)	—	0.120 (3.05)	—	0.040 (1.02)	—	1.512 (38.51)
GD		35 / 8	86 / 33	144 / 47	200 / 50	— / —	144 / 37		0.125 (3.18)	—	1.000/1.090 (25.40/27.69)	—	0.085 (2.16)	—	0.030 (0.76)	—	1.340 (34.04)

*Auxiliary levers on light force D40, D41 and D42 will be made out of Aluminum.

†YD suffix for D40, D41 and D42. ††XD suffix for D40, D41 and D42. †††YL suffix for D40, D41 and D42.

Ordering Information — US Versions

D4			3			V3			L			D		
Series/Prefix												Code		
Code	EN61058	UL1054	Mounting Holes	NO	NC	DT	Oper. Force	Temp. Index	Code	Actuator Type	A	D	L	
0	N/A	1.0A, 125VAC	US Mounting Holes (VDE Optional)	A	B	C	Std.	85°C	AA	Button	—	—	—	
1	0.1(0.5)A, 250V	0.1A, 125/250VAC		D	E	F	Std.	150°C*	L	Lever SR	0.865 (21.97)	1.400 (35.56)	2.757 (70.02)	
2	3(1)A, 250V	3A, 125/250VAC 1/10HP, 250VAC		J	K	L	Light		M	Lever HR	1.042 (26.47)	1.580 (40.13)	2.934 (74.52)	
3	6(2)A, 250V	5A, 1/4HP, 125/250VAC		W	X	Y	Light		Y	Alum. Lever SR	—	1.400 (35.56)	2.757 (70.03)	
4	10(3)A, 250V	10A, 1/2HP, 125/250VAC							X	Alum. Lever HR	—	1.580 (40.13)	2.932 (74.47)	
5	16(4)A, 250V 10(3)A, 400V~ (Std. force only)	15A, 1/2HP, 125/250VAC							J	SS Lever SR	—	—	2.757 (70.03)	
8	21(8)A, 250V	21A, 1HP, 125VAC 2HP, 250VAC							K	SS Lever HR	—	—	2.932 (74.47)	
9	N/A	10A, 1/2HP, 125/250VAC 6A, 30VDC							R	Roller SR	0.810 (20.57)	1.340 (34.04)	—	
									T	Roller HR	0.987 (25.07)	1.516 (38.51)	—	
									G	1-Way Roller SR	0.810 (20.57)	1.340 (34.04)	—	
									N	1-Way Roller HR	0.987 (25.07)	1.516 (38.51)	—	

*D45 and D48 with VDE only available with metric holes. See European ordering information.

Code	Terminal Type	inches (mm)
Q1	0.187 x 0.032 (4.8 x 0.8) QC	Straight*
Q3	0.187 x 0.032 (4.8 x 0.8) QC	Dog Leg*
R1	0.187 x 0.020 (4.8 x 0.8) QC,	Straight*
V1	0.250 x 0.032 (6.3 x 0.8) QC,	Straight
V3	0.250 x 0.032 (6.3 x 0.8) QC,	Dog Leg

Code		Actuation Length inches (mm)		
		A	D	L
AA	Button	—	—	—
L	Lever SR	0.865 (21.97)	1.400 (35.56)	2.757 (70.02)
M	Lever HR	1.042 (26.47)	1.580 (40.13)	2.934 (74.52)
Y	Alum. Lever SR	—	1.400 (35.56)	2.757 (70.03)
X	Alum. Lever HR	—	1.580 (40.13)	2.932 (74.47)
J	SS Lever SR	—	—	2.757 (70.03)
K	SS Lever HR	—	—	2.932 (74.47)
R	Roller SR	0.810 (20.57)	1.340 (34.04)	—
T	Roller HR	0.987 (25.07)	1.516 (38.51)	—
G	1-Way Roller SR	0.810 (20.57)	1.340 (34.04)	—
N	1-Way Roller HR	0.987 (25.07)	1.516 (38.51)	—

SR = Standard Ratio, Back Hole • HR = High Ratio, Front Hole
Additional actuators available upon request.

VDE optional for D41–D44 with U.S. mounting holes.

*Not available for D48.

SR = Standard Ratio, Back Hole • HR = High Ratio, Front Hole
Additional actuators available upon request.



Actuator Specifications — European Versions

Actuator Type	Switch Type	Maximum Operating Force (Gms.)						Maximum Pre-Travel inches (mm)		Operating Point inches (mm)	Minimum Over Travel inches (mm)		Max. Movement Differential inches (mm)		Max. Rest Position inches (mm)		Actuation Length inches (mm)
		D40, Std / Light	D42, Std / Light	D43, Std / Light	D44, Std / Light	D45, Std / Light	D48	D41-D45	D48		D41-D45	D48	D41-D45	D48	D41-D45	D48	
AA		75 / 15	170 / 45	285 / 75	400 / 100	150		0.047 (1.2)	0.063 (1.6)	0.543/0.598 (13.8/15.2)	0.051 (1.3)	0.047 (1.2)	0.012 (0.3)	0.012 (0.3)	0.638 (16.2)	0.638 (16.2)	—
MA/KA		50 / 10	110 / 28	180 / 50	256 / 65	100		0.087 (2.2)	0.118 (3.0)	0.567/0.630 (14.4/16.0)	0.063 (1.6)	0.055 (1.4)	0.024 (0.6)	0.024 (0.6)	0.740 (18.8)	0.740 (18.8)	1.01 (25.7)
LA/JA*		85 / 17	190 / 50	320 / 85	440 / 115	180		0.047 (1.2)	0.063 (1.6)	0.579/0.618 (14.7/15.7)	0.035 (0.9)	0.031 (0.8)	0.012 (0.3)	0.012 (0.3)	0.661 (16.8)	0.661 (16.8)	0.835 (21.2)
JD/LD*		40 / 8	86 / 22	144 / 40	200 / 50	75		0.126 (3.2)	0.150 (3.8)	0.551/0.646 (14.0/16.4)	0.091 (2.3)	0.071 (1.8)	0.031 (0.8)	0.031 (0.8)	0.780 (19.8)	0.780 (19.8)	1.40 (35.6)
KD/MD*		25 / 5	50 / 14	86 / 25	120 / 30	45		0.200 (5.1)	0.252 (6.4)	0.535/0.661 (13.6/16.8)	0.142 (3.6)	0.126 (3.2)	0.051 (1.3)	0.051 (1.3)	0.874 (22.2)	0.874 (22.2)	1.58 (40.1)
LL/JL*		17 / 3.5	40 / 10	60 / 17	90 / 22	35		0.299 (7.6)	0.346 (8.8)	0.465/0.724 (11.8/18.4)	0.185 (4.7)	0.169 (4.3)	0.067 (1.7)	0.067 (1.7)	0.992 (25.2)	0.992 (25.2)	2.75 (69.9)
ML/KL*		10 / 2	25 / 6	40 / 10	56 / 13	20		0.500 (12.7)	0.575 (14.6)	0.433/0.764 (11.0/19.4)	0.031 (7.9)	0.283 (7.2)	0.098 (2.5)	0.098 (2.5)	1.210 (30.8)	1.210 (30.8)	2.93 (74.4)
RA		90 / 15	190 / 45	330 / 75	440 / 100	180		0.047 (1.2)	0.067 (1.7)	0.776/0.839 (19.7/21.3)	0.039 (1.0)	0.031 (0.8)	0.016 (0.4)	0.012 (0.3)	0.858 (21.8)	0.866 (22.0)	0.811 (20.6)
RD		40 / 8	86 / 22	144 / 40	200 / 50	75		0.126 (3.2)	0.150 (3.8)	0.764/0.850 (19.4/21.6)	0.087 (2.2)	0.071 (1.8)	0.031 (0.8)	0.031 (0.8)	0.976 (24.8)	0.976 (24.8)	1.34 (34.1)
TD		25 / 14	55 / 14	86 / 22	120 / 30	50		0.200 (5.1)	0.244 (6.2)	0.744/0.870 (18.9/22.1)	0.142 (3.6)	0.118 (3.0)	0.051 (1.3)	0.047 (1.2)	1.080 (27.4)	1.078 (27.4)	1.52 (38.6)
TA		55 / 10	110 / 30	200 / 55	260 / 70	110		0.087 (2.2)	0.118 (3.0)	0.764/0.850 (19.4/21.6)	0.063 (1.6)	0.051 (1.3)	0.024 (0.6)	0.024 (0.6)	0.937 (23.8)	0.945 (24.0)	0.988 (25.1)
UA		55 / 11	120 / 32	215 / 55	280 / 70	110		0.087 (2.2)	0.118 (3.0)	0.768/0.846 (19.5/21.5)	0.063 (1.6)	0.051 (1.3)	0.020 (0.5)	0.020 (0.5)	0.937 (23.8)	0.945 (24.0)	0.988 (25.1)
SA		85 / 17	190 / 50	330 / 85	440 / 115	200		0.051 (1.3)	0.067 (1.7)	0.780/0.835 (19.8/21.2)	0.039 (1.0)	0.031 (0.8)	0.012 (0.3)	0.012 (0.3)	0.858 (21.8)	0.866 (22.0)	0.811 (20.6)

*On light force D41 and D42, auxiliary actuators MD, ML, LD and LL are made out of Aluminum.

Ordering Information — European Versions

D4		3	
Series/Prefix			
Code	EN61058	UL1054	
1	0.1(0.5)A, 250V	0.1A, 125/250VAC	
2	3(1)A, 250V	3A, 125/250VAC 1/10HP, 250VAC	
3	6(2)A, 250V	5A, 1/4HP, 125/250VAC	
4	10(3)A, 250V	10A, 1/2HP, 125/250VAC	
5	16(4)A, 250V 10(3)A, 400V~ (Std. force only)	15A, 1/2HP, 125/250VAC	
8	21(8)A, 250V	21A, 1HP, 125VAC 2HP, 250VAC	
9	N/A	10A, 1/2HP, 125/250VAC 6A, 30VDC	

EN standard on all D4 European designs.

Mounting Holes	3			Oper. Force	Temp. Index
	NO	NC	DT		
	1	2	3		
	7	8	9		
	G	H	M		
European Metric Mounting Holes (EN Standard)	N	P	R	Light	125°C
	S	T	U		
				Light	150°C

Code	Terminal Type	inches (mm)
A1	Welding	
B8	Short Solder*	
C1	0.110 x 0.032 (2.8 x 0.8) QC, Bifurcated Straight**	
C3	0.110 x 0.032 (2.8 x 0.8) QC, Bifurcated Dog Leg**	
P4	0.047 x 0.020 (1.2 x 0.5) PCB, Underside*	
P5	0.047 x 0.020 (1.2 x 0.5) PCB, Rear*	
PA	0.047 x 0.032 (1.2 x 0.8) PCB, Housing Side*	
PB	0.047 x 0.032 (1.2 x 0.8) PCB, Cover Side*	
Q1	0.187 x 0.032 (4.8 x 0.8) QC Straight*	
Q3	0.187 x 0.032 (4.8 x 0.8) QC Dog Leg*	
R1	0.187 x 0.020 (4.8 x 0.8) QC, Straight**	
R3	0.187 x 0.020 (4.8 x 0.5) QC, Dog Leg**	
S1	Solder with Temp. Stop	
V1	0.250 x 0.032 (6.3 x 0.8) QC, Straight	
V3	0.250 x 0.032 (6.3 x 0.8) QC, Dog Leg	
W9	Screw*	
Y5	0.250 x 0.032 (6.3 x 0.8) QC, 5mm Grid	
Z5	0.250 x 0.032 (6.3 x 0.8) QC, 7mm Grid	

* Not available for D48 European versions.
** Not available for D45 or D48 versions.

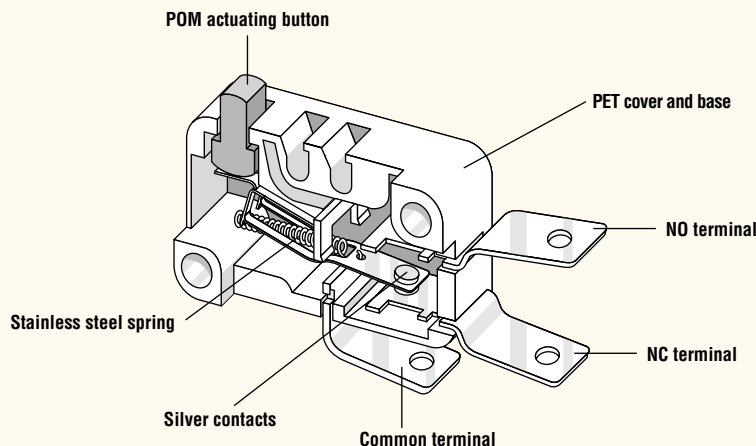
Code	Actuator Type	D		
		Code A	Actuation Length inches (mm)	D L
AA	Button	—	—	—
J	SS Lever SR	0.835 (21.2)	1.4 (35.6)	2.75 (69.9)
K	SSLever HR	1.01 (25.7)	—	2.93 (74.4)
L	Lever SR	0.835 (21.2)	1.4 (35.6)	2.75 (69.9)
M	Lever HR	1.01 (25.7)	—	2.93 (74.4)
R	Roller SR	0.811 (20.6)	1.34 (34.1)	—
S	Sim. Roller SR	0.811 (20.6)	—	—
T	Roller HR	0.988 (25.1)	1.52 (38.6)	—
U	Sim. Roller HR	0.988 (25.1)	—	—

SR = Standard Ratio, Back Hole • HR = High Ratio, Front Hole
Additional actuators available upon request.

MINIATURE D3 Series

Features

- Self-cleaning effect of wiping contact mechanism provides excellent reliability
- Suitable for low actuation speeds
- Highly flexible, due to two mounting positions and a variety of auxiliary actuators
- Wide variety of terminal types
- >3mm (0.12") contact gap available



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to EN (Min. Operations)	According to UL (Min. Operations)
D36 – Std.	4(2.5)A, 250V~	4A, 250VAC	50,000	6,000
D37 – Std.	10(3)A, 250V~	10A, 1/2HP, 125/250VAC	50,000	6,000
D38 – Std.	16(4)A, 250V~ 10(3)A, 400V~	16A, 125/250VAC, 1HP	50,000	6,000
D36 – Light	4(1)A, 250V~	4A, 250VAC	50,000	6,000
D37 – Light	10(2)A, 250V~	10A, 1/2HP, 125/250VAC	50,000	6,000
D38 – Light	16(2.5)A, 250V~ 10(1.5)A, 400V~	16A, 125/250VAC, 1HP	50,000	6,000

Specifications

Electrical

Temperature Rating:	-40° to +85°C
Flammability Rating:	UL94V-O

Materials

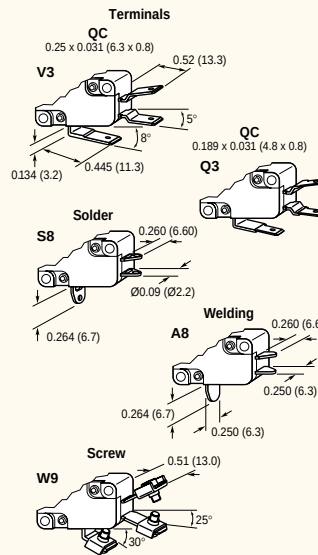
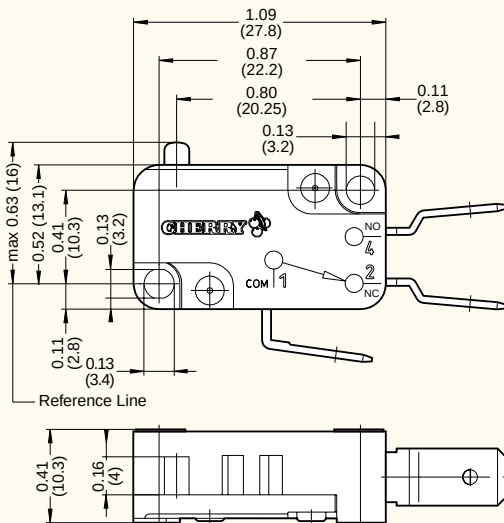
Case:	PET
Actuator:	POM
Auxiliary Actuator:	Stainless Steel; Nickel-Plated Steel
Terminals:	Copper-Zinc
Contacts:	Silver Cadmium Oxide

PET = Polyethyleneterephthalate • POM = Polyacetal

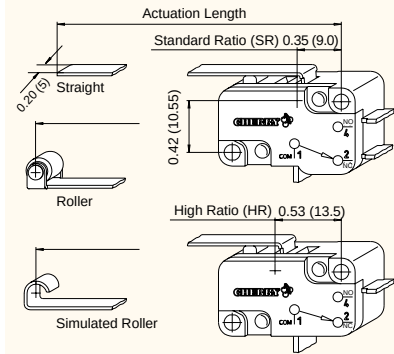




Dimensions inches (mm)



Auxiliary Actuators



Actuator Specifications

Actuator Type	Switch Type	Maximum Operating Force (cN)						Maximum Pre-Travel inches (mm)	Operating Point* inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Max. Rest Position inches (mm)	Actuation Length** inches (mm)
		D36 Std.	D37 Std.	D38 Std.	D36 Light	D37 Light	D38 Light						
AA		170	260	400	60	130	200	0.059 (1.5)	0.559/0.598 (14.2/15.2)	0.047 (1.2)	0.012 (0.3)	0.63 (16.0)	—
MA/KA		120	170	265	40	85	130	0.106 (2.7)	0.567/0.630 (14.4/16.0)	0.067 (1.7)	0.024 (0.6)	0.71 (18.0)	1.012 (25.7)
MD/KD		50	80	120	18	40	60	0.232 (5.9)	0.528/0.669 (13.4/17.0)	0.146 (3.7)	0.051 (1.3)	0.85 (21.6)	1.579 (40.1)
ML/KL		22	35	50	10	18	25	0.528 (13.4)	0.433/0.764 (11.0/19.4)	0.335 (8.5)	0.118 (3.0)	1.19 (30.1)	2.929 (74.4)
LA/JA		180	280	425	65	140	210	0.063 (1.6)	0.579/0.618 (14.7/15.7)	0.039 (1.0)	0.016 (0.4)	0.66 (16.8)	0.835 (21.2)
LD/JD		80	130	200	30	65	100	0.138 (3.5)	0.551/0.646 (14.0/16.4)	0.083 (2.1)	0.031 (0.8)	0.75 (19.1)	1.402 (35.6)
LL/JL		35	55	80	15	28	40	0.311 (7.9)	0.488/0.709 (12.4/18.0)	0.193 (4.9)	0.071 (1.8)	0.97 (24.6)	2.752 (69.9)

*Measured above reference line. Refer to dimensional drawing above. **Actuator tolerance ± 0.031 inches (0.8mm).

Ordering Information

D3	7
Series/Prefix	
Code	Current Rating
Standard Force	
6	4A, 250VAC (UL, CSA) 4(2.5)A, 250V~ (ENEC)
7	10A, 1/2HP, 125/250VAC (UL, CSA); 10(3)A, 250V~ (ENEC)
8	16A, 125/250VAC, 1HP (UL, CSA) 16(4)A, 250V~; 10(3)A, 400V~ (ENEC)
Light Force	
6	4A, 250VAC (UL, CSA) 4(1)A, 250V~ (ENEC)
7	10A, 1/2HP, 125/250VAC (UL, CSA) 10(2)A, 250V~ (ENEC)
8	16A, 125/250VAC, 1HP (UL, CSA) 16(2.5)A, 250V~; 10(1.5)A, 400V~ (ENEC)

3		—	
Code	Contact Configuration		
Standard Operating Force			
1	SPST NO		
2	SPST NC		
3	SPDT		
Light Operating Force			
7	SPST NO		
8	SPST NC		
9	SPDT		

Code	Terminal Type inches (mm)
V3	0.25 x 0.031 (6.3 x 0.8) QC
Q3	0.189 x 0.031 (4.8 x 0.8) QC
S8	Solder with Temp. Stop
W9	Screw
A8	Welding

Note: PCB terminals available upon request.

Code	Actuator Type	Actuation Length inches (mm)		
		A	D	L
AA	Button	—	—	—
J	Straight, Stainless, SR	0.835 (21.2)	1.402 (35.6)	2.752 (69.9)
K	Straight, Stainless, HR	1.012 (25.7)	1.579 (40.1)	2.929 (74.4)
L	Straight, SR	0.835 (21.2)	1.402 (35.6)	2.752 (69.9)
M	Straight, HR	1.012 (25.7)	1.579 (40.1)	2.929 (74.4)
R	Roller, SR	0.811 (20.6)	1.343 (34.1)	—
S	Simulated Roller, SR	0.811 (20.6)	—	—
T	Roller, HR	0.988 (25.1)	1.520 (38.6)	—
U	Simulated Roller, HR	0.988 (25.1)	—	—

Contact Gap >3mm (0.12 inch)

Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to EN (Min. Operations)	According to UL (Min. Operations)
D36	4(3)A, 250V~	4A, 250VAC, 1/3HP 125/250VAC	50,000	10,000
D37	10(4)A, 250V~	10A, 1/2HP, 125/250VAC	50,000	6,000
D3B	8(8)A, 250V~	10A, 1/2HP, 125/250VAC	50,000	10,000

Actuator Specifications

Actuator Code	Switch Type	Maximum Operating Force (cN)	Maximum Pre-Travel inches (mm)	Operating Point* inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Max. Rest Position inches (mm)	Actuation Length inches (mm)
AA		500	0.075 (1.9)	0.567±0.020 (14.4±0.5)	0.028 (0.7)	0.047 (1.2)	0.63 (16.0)	—
MA/KA		320	0.134 (3.4)	0.579±0.031 (14.7±0.8)	0.035 (0.9)	0.079 (2.0)	0.71 (18.0)	1.012 (25.7)
TA		forces and travel available upon request						0.988 (25.1)
UA		forces and travel available upon request						0.988 (25.1)
MD/KD		150	0.295 (7.5)	0.563±0.075 (14.3±1.9)	0.075 (1.9)	0.177 (4.5)	0.86 (21.8)	1.579 (40.1)
TD		forces and travel available upon request						1.520 (38.6)
KL		65	0.669 (17.0)	0.512±0.165 (13.0±4.2)	0.165 (4.2)	0.409 (10.4)	1.21 (30.8)	2.929 (74.4)
LA/JA		550	0.075 (1.9)	0.587±0.020 (14.9±0.5)	0.024 (0.6)	0.047 (1.2)	0.66 (16.8)	0.835 (21.2)
RA		forces and travel available upon request						0.811 (20.6)
SA		forces and travel available upon request						0.811 (20.6)
LD/JD		240	0.177 (4.5)	0.575±0.047 (14.6±1.2)	0.047 (1.2)	0.102 (2.6)	0.76 (19.2)	1.402 (35.6)
RD		forces and travel available upon request						1.343 (34.1)
JL		100	0.425 (10.8)	0.520±0.110 (13.2±2.8)	0.126 (3.2)	0.256 (6.5)	0.098 (25.0)	2.752 (69.9)

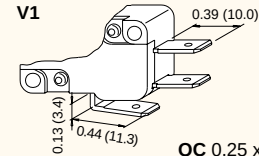
Ordering Information

D3			7	4	Q3			LD
Series/Prefix					Actuator Code			
					See table above			
Code	UL Rating	EN 61058 Rating	Code	Contact Configuration	Code	Terminal Type	inches (mm)	
6	4A, 1/3HP, 125/250VAC	4(3)A, 250V~	4	SPST NO	V1	0.25 x 0.03 (6.3 x 0.8) QC, Straight		
7	10A, 1/2HP, 125/250VAC	10(4)A, 250V~	5	SPST NC (D3B only)	V3	0.25 x 0.03 (6.3 x 0.8) QC, Dog Leg		
B	10A, 1/2HP, 125/250VAC	8(8)A, 250V~	6	SPDT (D3B only)	Q1	0.19 x 0.03 (4.8 x 0.8) QC, Straight		
					Q3	0.19 x 0.03 (4.8 x 0.8) QC, Dog Leg		
					C1	0.11 x 0.03 (2.8 x 0.8) QC, Bifurcated Straight*		
					C3	0.11 x 0.03 (2.8 x 0.8) QC, Bifurcated Dog Leg*		
					S8	Solder with Temp. Stop		
					W9	Screw (D3B only)		
					A8	Welding		

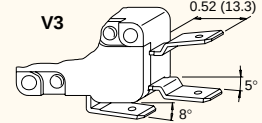
Note: PCB terminals available upon request.
*D36 only.

Terminal Options

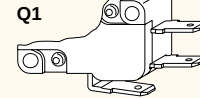
QC 0.25 x 0.03 (6.3 x 0.8)



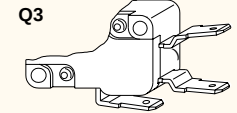
QC 0.25 x 0.03 (6.3 x 0.8)
Dog Leg



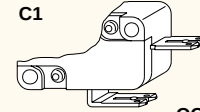
QC 0.19 x 0.03 (4.8 x 0.8)
Straight



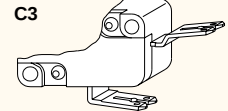
QC 0.19 x 0.03 (4.8 x 0.8)
Dog Leg



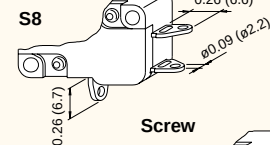
QC 0.11 x 0.03 (2.8 x 0.8)
Bifurcated, Straight



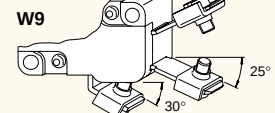
QC 0.11 x 0.03 (2.8 x 0.8)
Bifurcated, Dog Leg



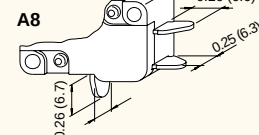
Solder



Screw



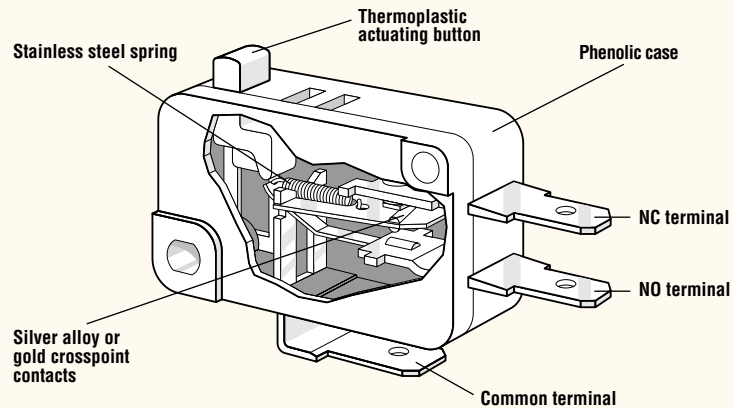
Welding



MINIATURE E Series

Features

- 8 current ratings AC
- 3 current ratings DC
- Choice of actuator styles
- Choice of terminals
- 3 contact arrangements
- Long-life coil spring mechanism
- Agency approved extended life versions
- High-temperature versions available



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
E21	N/A	0.1A, 125VAC (0.25A, 30VDC optional)	N/A	6,000*
E22	N/A	3A, 125/250VAC 1/10HP, 250VAC (0.1A, 125VDC optional)	N/A	6,000
E23	N/A	5A, 1/4HP, 125/250VAC	N/A	6,000*
E31	N/A	1A, 125VAC	N/A	6,000*
E33	N/A	10A, 1/2HP, 125/250VAC (6A, 30VDC optional)	N/A	6,000*
E34	N/A	15A, 1/2HP, 125/250VAC	N/A	6,000*
E35	N/A	20.1A, 1/2HP, 125/250VAC	N/A	6,000
E36	N/A	25A, 125/250VAC; 1HP, 125VAC 2HP, 250VAC	N/A	6,000

*Indicates 100K life available.

Specifications

Electrical

Temperature Rating:	-40° to +85°C (130°C and 150°C optional, except E36)
Flammability Rating:	UL94HB

Materials

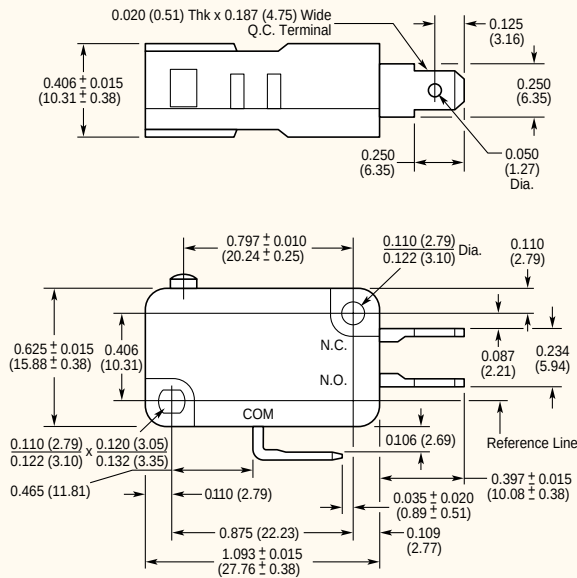
Case:	General Purpose Phenolic
Actuating Button:	Thermoplastic Acetal
Common Terminals:	Silver-Plated Brass (E21, E22, E23, E31, E33, E34, E35) Silver-Plated Copper (E36)
NO & NC Terminals:	Brass (E21, E22, E23, E31, E33, E34, E35) Copper (E36)
Moving Blade:	Brass (E21, E22, E23) Silver-Plated Beryllium Copper (E31, E33, E34, E35, E36)
Spring:	Stainless Steel
Auxiliary Actuator:	Cold-Rolled Steel (Nickel-Plated) (except E21 and E22 — Aluminum)
Roller:	Sintered Stainless Steel
Contacts:	Silver Alloy (except E21 and E31 — Gold Crosspoint)



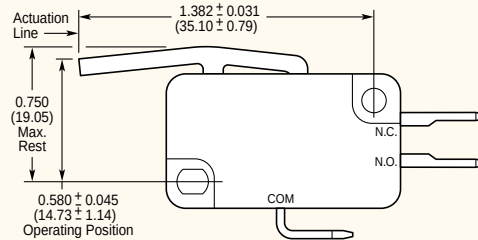
US (E34 and E35 only)



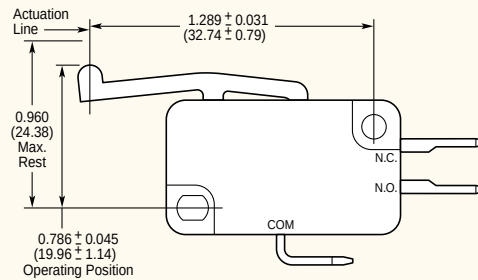
Dimensions — Standard Force inches (mm)



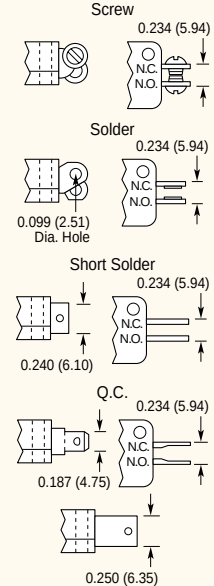
Part Number Suffix -50N



Part Number Suffix -90N



Terminals



Actuator Specifications — Standard Force

Actuator Type	Switch Type	Max. Operating Force (gms.)				Maximum Pre-Travel inches (mm)	Operating Point* inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Actuation Length** inches (mm)
		E21, E22	E23, E31	E33	E34					
-00A		75	170	285	400	0.047 (1.19)	0.578±0.020 (14.68±0.51)	0.050 (1.27)	0.010 (0.25)	—
-00H		75	170	285	400	0.062 (1.57)	0.600±0.020 (15.24±0.51)	0.050 (1.27)	0.016 (0.41)	0.865 (21.97)
-50H		35	86	144	200	0.125 (3.18)	0.600±0.045 (15.24±1.14)	0.085 (2.16)	0.030 (0.76)	1.400 (35.56)
-50HL		20	51	86	120	0.220 (5.59)	0.600±0.075 (15.24±1.91)	0.130 (3.30)	0.040 (1.02)	1.580 (40.13)
-00K		75	170	285	400	0.047 (1.19)	0.806±0.030 (20.47±0.76)	0.040 (1.02)	0.010 (0.25)	0.810 (20.57)
-50K		35	86	144	200	0.125 (3.18)	0.806±0.045 (20.47±1.14)	0.085 (2.16)	0.030 (0.76)	1.340 (34.04)
-50KL		25	51	86	120	0.200 (5.08)	0.806±0.075 (20.47±1.91)	0.120 (3.05)	0.040 (1.02)	1.516 (38.51)
-50P		35	86	144	200	0.125 (3.18)	1.045±0.045 (26.54±1.14)	0.085 (2.16)	0.030 (0.76)	1.340 (34.04)
-50N [†]		35	86	144	200	0.175 (4.45)	0.600±0.045 (15.24±1.14)	0.065 (1.65)	0.030 (0.76)	1.382 (35.10)
-90N [†]		35	86	144	200	0.125 (3.18)	0.793±0.058 (20.14±1.47)	0.085 (2.16)	0.030 (0.76)	1.289 (32.74)

*Measured above reference line. Refer to dimensional drawing above. **Actuator tolerance ± 0.031 inches (0.79mm).

[†]Only available with 85°C temperature rating.

Note: E35 and E36 not available in standard force. See Miniature E Series Light Force for ordering information. Suffix numbers shown represent switch with 0.187" (4.75mm) terminals.

Mounting — Standard Force

Recommended mounting screw size: #4-40 round head. Recommended torque on screw: 3 inch lbs. max.

Ordering Information

Select the current rating you need. Combine the corresponding Series/Prefix number with the appropriate suffix number for the switch type, circuitry and terminals you require.

Circuitry — Standard Force

Contact arrangement available in choice of single pole double throw or single pole single throw, either normally open or normally closed. In general normally open may be specified by changing suffix number from 00 to 01 and normally closed by changing suffix number to 02.

Terminals — Standard Force

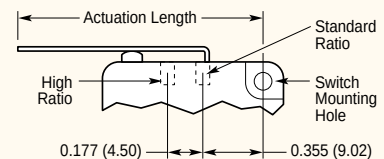
Choice of screw, solder or two quick connect terminals.

Note: 0.187" Quick Connect terminals are standard. Normally, to order screw terminals add 10 to suffix number. To order solder terminals add 20 to suffix number and to order 0.250" Q.C. terminals add 40 to suffix number.

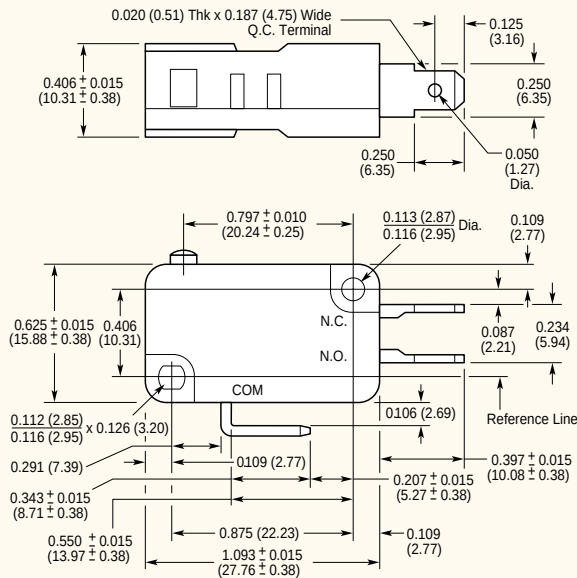
Terminal	SPDT	SPST NO	SPST NC
QC 0.187"	-00A	-01A	-02A
Screw	-10A	-11A	-12A
Solder	-20A	-21A	-22A
Short Solder	-30A	-31A	-32A
QC 0.250"	-40A	-41A	-42A

Actuators — Standard Force

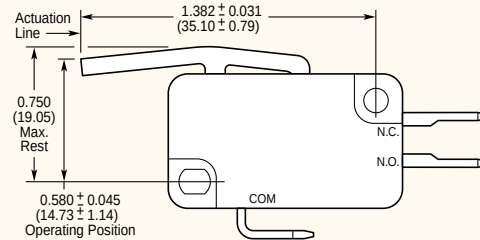
Many special forms and lengths of actuators are available. Standard type integral hinged lever and roller actuators are available in choice of 2 mounting positions. Actuation lengths are dimensioned from centerline of switch mounting hole as shown.



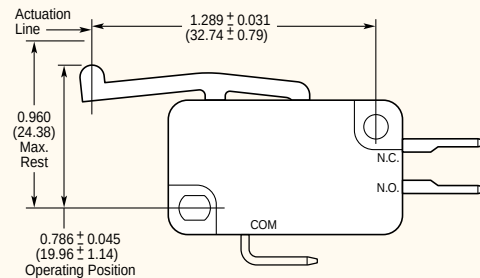
Dimensions — Light Force inches (mm)



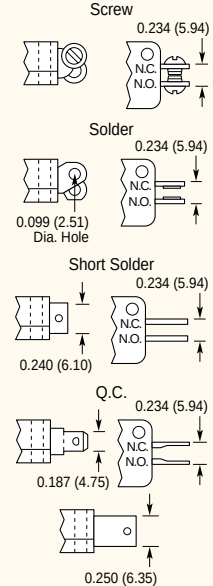
Part Number Suffix -50NX



Part Number Suffix -90NX



Terminals



Actuator Specifications — Light Force

Actuator Type	Switch Type	Max. Operating Force (gms.)						Maximum Pre-Travel inches (mm)	Operating Point* inches (mm)	Minimum Over-Travel inches (mm)	Maximum Movement Differential inches (mm)	Actuation Length** inches (mm)
		E21, E22	E23, E31	E33	E34	E35	E36					
-00AX		15	45	75	100	—	—	0.047 (1.19)	0.578±0.020 (14.68±0.51)	0.050 (1.27)	0.010 (0.25)	—
-00HX		15	45	75	100	—	—	0.062 (1.57)	0.600±0.020 (15.24±0.51)	0.050 (1.27)	0.016 (0.41)	0.865 (21.97)
-50HX		8	22	37	50	—	—	0.125 (3.18)	0.600±0.045 (15.24±1.14)	0.085 (2.16)	0.030 (0.76)	1.400 (35.56)
-75HX		5	14	22	30	—	—	0.220 (5.59)	0.600±0.075 (15.24±1.91)	0.130 (3.30)	0.040 (1.02)	1.580 (40.13)
-50KX		8	22	37	50	—	—	0.125 (3.18)	0.806±0.045 (20.47±1.14)	0.085 (2.16)	0.030 (0.76)	1.340 (34.04)
-75KX		5	14	22	30	—	—	0.200 (5.08)	0.806±0.075 (20.47±1.91)	0.120 (3.05)	0.040 (1.02)	1.516 (38.51)
-55HX		4	10	17	22	—	—	0.300 (7.62)	0.600±0.100 (15.24±2.54)	0.187 (4.75)	0.065 (1.65)	2.757 (70.03)
-85HX		2	6	10	13	—	—	0.500 (12.70)	0.600±0.175 (15.24±4.45)	0.312 (7.92)	0.100 (2.54)	2.932 (74.47)
-50NX†		8	22	37	50	65	112	0.175 (4.45)	0.600±0.045 (15.24±1.14)	0.065 (1.65)	0.303 (0.76)	1.382 (35.10)
-90NX†		8	22	37	50	65	112	0.125 (3.18)	0.793±0.058 (20.14±1.47)	0.085 (2.16)	0.030 (0.76)	1.289 (32.74)
-40AX		—	—	—	—	120	220	0.070 (1.78)	0.557±0.020 (14.15±0.51)	0.035 (0.89)	0.010 (0.25)	—

*Measured above reference line. Refer to dimensional drawing above. **Actuator tolerance ±0.031 inches (0.79mm).

†Only available with 85°C temperature rating.

Note: Suffix numbers shown represent switch with 0.187" (4.75mm) terminals.

Mounting — Light Force

Recommended mounting screw size:
#4-40 round head. Recommended torque
on screw: 3 inch lbs. max.

Ordering Information

Select the current rating you need.
Combine the corresponding Series/Prefix
number with the appropriate suffix number
for the switch type, circuitry and terminals
you require.

Circuitry — Light Force

Contact arrangement available in choice of
single pole double throw or single pole single
throw, either normally open or normally
closed. In general normally open may be
specified by changing suffix number from
00 to 01 and normally closed by changing
suffix number to 02.

Terminals — Light Force

Choice of screw, solder or two quick
connect terminals.

Note: 0.187" Quick Connect terminals are
standard. Normally, to order screw terminals
add 10 to suffix number. To order solder
terminals add 20 to suffix number and to
order 0.250" Q.C. terminals add 40 to
suffix number.

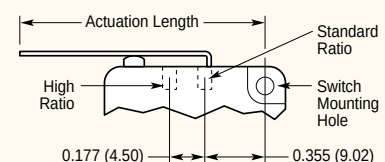
Exception: When ordering -55HX, -75HX,
-75KX or -85HX switches with screw, solder
or 0.250" terminals, consult factory.

Terminal	SPDT	SPST NO	SPST NC
QC 0.187"	-00AX	-01AX	-02AX
Screw	-10AX	-11AX	-12AX
Solder	-20AX	-21AX	-22AX
Short Solder	-30AX	-31AX	-32AX
QC 0.250"	-40AX	-41AX	-42AX

*E35 and E36 only available with 0.250" (6.35) terminals.

Actuators — Light Force

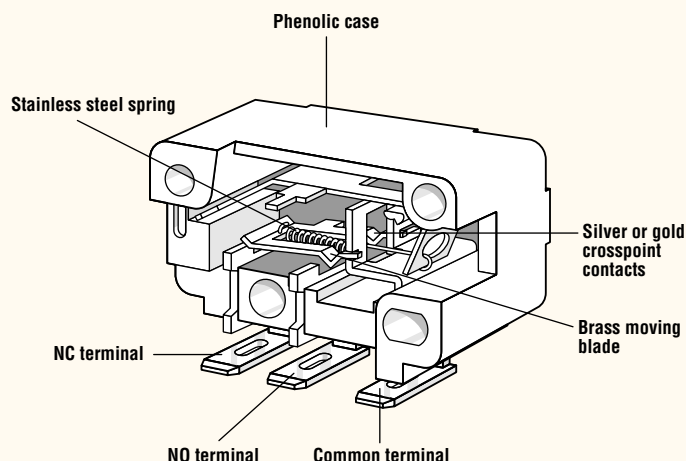
Many special forms and lengths of actuators
are available. Standard type integral hinged
lever and roller actuators are available in
choice of 2 mounting positions. Actuation
lengths are dimensioned from centerline of
switch mounting hole as shown.



MINIATURE LOW TORQUE E Series

Features

- Long life coil spring mechanism
- Low torque rotary actuation
- Clockwise or counter clockwise actuation
- 6 terminal types
- Double rivet sturdy case construction
- 3 contact arrangements



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
E51	N/A	6A, 250VAC	N/A	6,000
E53	N/A	0.1A, 125VAC	N/A	6,000

Specifications

Electrical

Temperature Rating:	-40° to +85°C
Flammability Rating:	UL94HB

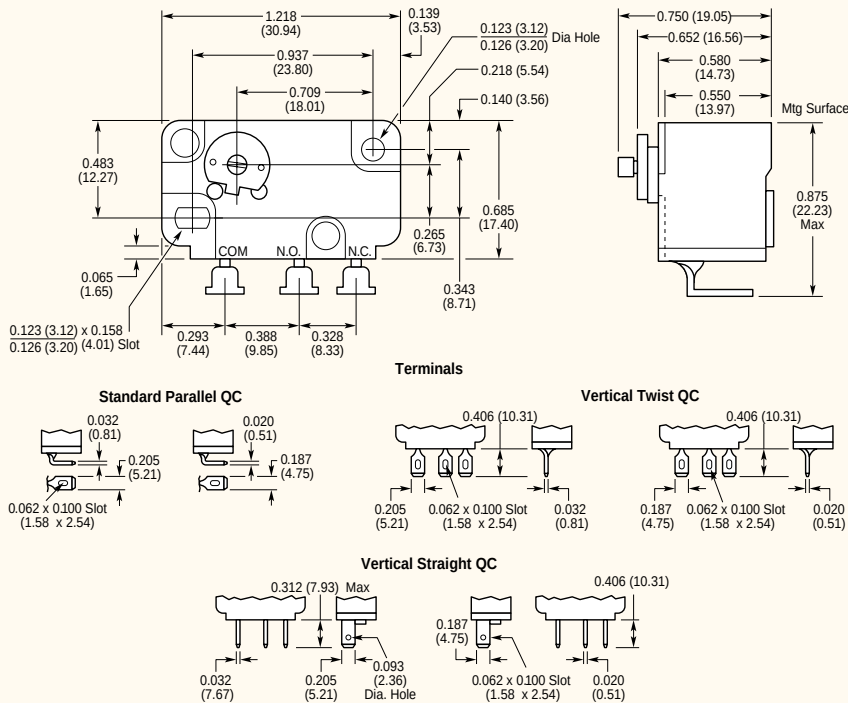
Materials

Case:	General Purpose Phenolic
Terminal:	Silver-Plated Brass
Moving Blade:	Brass
Contacts:	Silver Alloy (E51), Gold Crosspoint (E53)
Spring:	Stainless Steel



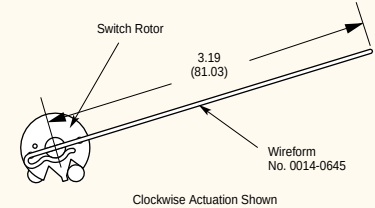


Dimensions inches (mm)



Actuators

Wireform actuators are supplied unassembled for each switch. Wireforms may be readily assembled to switch rotor as shown.



Circuitry

This series is available in single pole double throw and single pole single throw either normally open or normally closed. In general, normally open may be specified by adding 01 to suffix numbers, and normally closed by adding 02.

For example, E51-00B is double throw, E51-01B is normally open and E51-02B is normally closed.

Mounting

Recommended mounting screw size: #4-40 Round head. Recommended torque on screw: 4 inch lbs. max.

Operating Characteristics

Standard Force	4.0" gms. (max.)
Overtravel	15° min. (10.5 gram – cm)
Movement Differential	3° min.

Note: Special models and tooling capability available for custom wire form actuators.

Note: Additional operating forces available upon request. Consult factory.

Ordering Information

Select the current rating you need. Combine the corresponding Series/Prefix number with the appropriate suffix number for the switch type, circuitry and terminals you require.

Actuator Specifications

Switch Type	Actuator Type	Direction of Actuator	Terminals inches (mm)
	-00B	Clockwise	Standard Parallel 0.205 (5.21)
	-00R	Clockwise	Standard Parallel 0.187 (4.75)
	-00E	Counter Clockwise	Standard Parallel 0.205 (5.21)
	-00T	Counter Clockwise	Standard Parallel 0.187 (4.75)
	-50B	Clockwise	Vertical Twist 0.205 (5.21)
	-50R	Clockwise	Vertical Twist 0.187 (4.75)
	-50E	Counter Clockwise	Vertical Twist 0.205 (5.21)
	-50T	Counter Clockwise	Vertical Twist 0.187 (4.75)
	-60B	Clockwise	Vertical Straight 0.205 (5.21)
	-60R	Clockwise	Vertical Straight 0.187 (4.75)
	-60E	Counter Clockwise	Vertical Straight 0.205 (5.21)
	-60T	Counter Clockwise	Vertical Straight 0.187 (4.75)

MINIATURE K Series

Features

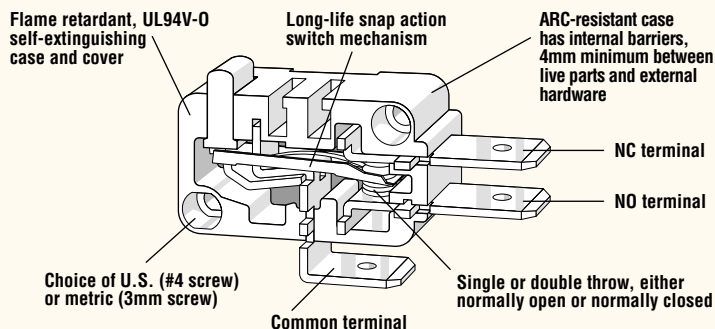
- Choice of current ratings up to 25 amps
- Choice of actuators
- Choice of terminals
- 3 contact arrangements
- Choice of operating force
- Long mechanical life
- Wiping contact action
- Snap over actuators
- Agency approved extended life versions

International Approved Versions

K Series switches, except 25A (KWS), are internationally approved. Switches with straight terminals may require insulated connectors for international approval.

Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
KWA/KWB	50mA, 28VDC	50mA, 28VDC	50,000	100,000
KWC/KWD	1(0.5)A, 250VAC	1.0A, 125/250VAC	50,000	100,000
KWE/KWF	3(1)A, 250VAC	3A, 1/10HP, 125/250VAC	50,000	100,000
KWG/KWH	6(2)A, 250VAC	5A, 1/4HP, 125/250VAC	50,000	100,000
KWJ/KWK	10(3)A, 250VAC	10A, 1/2HP, 125/250VAC	50,000	100,000
KWL	N/A	15.1A, 1/2HP, 125/250 VAC 5A, 125VAC Lamp Load (85°C only) 0.5A, 125VAC (85°C only) 0.25A, 250VAC (85°C only)	N/A	100,000
KWM	16(4)A, 250VAC	15.1A, 1/2HP, 125/250VAC 0.5A, 125VDC (85°C and 150°C only) 0.25A, 250VDC (85°C and 150°C only) 15.1A, 1/2HP, 125/250VAC (200°C only)	50,000	100,000
KWS	N/A	25A, 125/250VAC (85°C only) 1HP, 125VAC (85°C only) 2HP, 250VAC (85°C only)	N/A	100,000



Specifications

Electrical

Temperature Rating:	-40° to +85°C, 150°C or 200°C
Flammability Rating:	UL94V-0

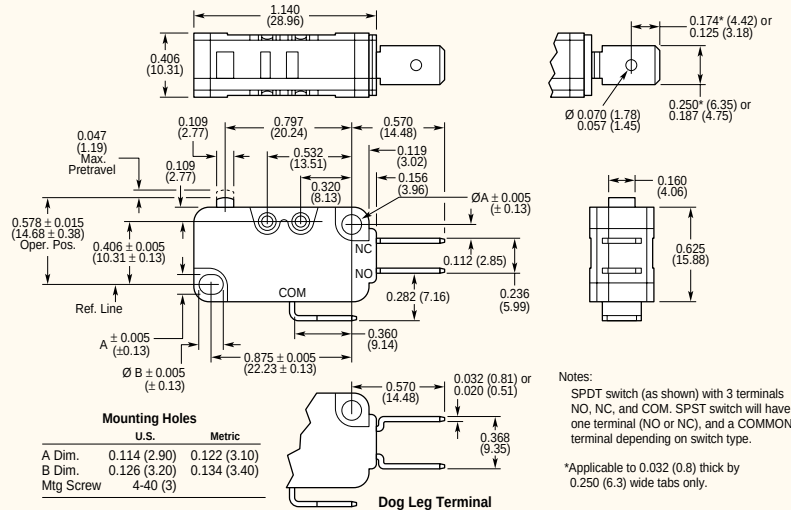
Materials

Case/Cover:	Thermoplastic Polyester (85°C or 150°C) Liquid Crystal Polymer (200°C)
Button:	Thermoplastic Acetal (85°C) Thermoplastic Polyester (150°C) Liquid Crystal Polymer (200°C)
Auxiliary Actuator:	Cold-Rolled Steel (Nickel-Plated)
Terminals:	Brass Copper (25 amp only)
Moving Blade:	Beryllium Copper
Contacts:	Silver Alloy (except KWA and KWB — Gold-Plated)





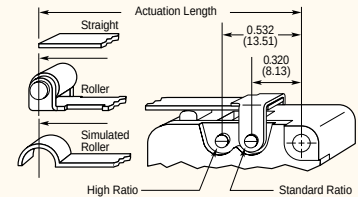
Dimensions inches (mm)



Actuators

Standard type snap over hinged lever and roller actuators are available in choice of two pivot positions. Lengths are dimensioned from centerline of switch upper mounting hole as shown here.

Auxiliary Actuator



Mounting

Recommended mounting screw size: #4-40 Round head. Recommended torque on screw: 3 inch lbs. max.

Actuator Specifications

Actuator Type	Switch Type	Maximum Operating Force (gms.)					Maximum Pre-Travel inches (mm)	Operating Point* inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Actuation Length** inches (mm)
		KWA, KWC, KWE	KWG	KWD, KWJ KWB, KWF	KWH, KWK, KWM	KWS					
A		25	50	75	150	225	0.047 (1.19)	0.563/0.593 (14.31/15.06)	0.050 (1.27)	0.010 (0.25)	— —
B		25	50	75	150	225	0.064 (1.63)	0.621/0.585 (15.78/14.85)	0.051 (1.29)	0.012 (0.31)	0.865 (21.97)
C		14	27	40	80	120	0.128 (3.26)	0.637/0.569 (16.18/14.45)	0.085 (2.16)	0.030 (0.76)	1.400 (35.56)
D		6	12	18	36	54	0.284 (7.22)	0.679/0.527 (17.25/13.38)	0.182 (4.62)	0.051 (1.30)	2.722 (69.14)
E		15	30	44	88	132	0.116 (2.95)	0.634/0.572 (16.11/14.52)	0.074 (1.88)	0.021 (0.54)	1.077 (27.36)
F		8	15	23	45	67	0.230 (5.85)	0.665/0.541 (16.90/13.74)	0.146 (3.71)	0.041 (1.05)	1.612 (40.94)
G		4	7	10	20	30	0.512 (13.01)	0.739/0.467 (18.78/11.86)	0.407 (10.33)	0.091 (2.32)	2.934 (74.52)
J		16	31	46	92	138	0.110 (2.80)	0.758/0.698 (19.26/17.72)	0.088 (2.23)	0.020 (0.51)	1.254 (31.85)
M		9	18	26	52	77	0.200 (5.08)	0.781/0.675 (19.84/17.14)	0.115 (2.92)	0.036 (0.92)	1.466 (37.24)
Q		15	29	43	85	127	0.120 (3.05)	0.852/0.786 (21.65/19.96)	0.096 (2.43)	0.022 (0.56)	1.340 (34.04)
T		8	16	24	47	71	0.218 (5.54)	0.877/0.761 (22.28/19.32)	0.173 (4.39)	0.039 (1.00)	1.552 (39.42)

*Measured above reference line. Refer to dimensional drawing above. **Actuator tolerance ± 0.031 inches (0.79mm).

Ordering Information

K Series/Prefix						A		D		Q		A C A	
Light						Standard		Code		Code		Code	
Code	Force	Code	Force	Rating	Notes	Code	Force	Code	Temperature Rating	Code	Terminal Type	Code	Type
A	25	B	75	50mA	1	A	25	A	85°C UL/CUL	P4	0.062 x 0.032 (1.57 x 0.81) PCB*	A	Button
C	25	D	75	1A	1	B	150	B	150°C UL/CUL	Q	0.187 x 0.020 (4.75 x 0.51) Straight	B	Straight SR
E	25	F	75	3A	1	C	200	C	200°C UL/CUL	R	0.187 x 0.020 (4.75 x 0.51) Dog Leg	C	Straight SR
G	50	H	150	5A	1	D	85°C UL/CUL/VDE	D	85°C UL/CUL/VDE	S	0.187 x 0.032 (4.75 x 0.81) Straight	D	Straight SR
J	75	K	150	10A	1	E	150°C UL/CUL/VDE	E	150°C UL/CUL/VDE	T	0.187 x 0.032 (4.75 x 0.81) Dog Leg	E	Straight HR
		L	150	15A	3					V	0.250 x 0.032 (6.35 x 0.81) Straight	F	Straight HR
		M	150	15A	2					W	0.250 x 0.032 (6.35 x 0.81) Dog Leg	G	Straight HR
		S	225	25A	3, 5							J	SIM Roller SR
												M	SIM Roller HR
												Y†	Roller SR
												Q	Roller SR
												W†	Roller HR
												T	Roller HR

Notes:

1. ± 0.031 inches (0.79mm) rated for 100,000 cycles at 85°C, 150°C, 200°C. VDE rated for 150°C only.
2. ± 0.031 inches (0.79mm) rated for 100,000 cycles at 85°C, 150°C, 200°C. VDE rated for 85°C only.
3. ± 0.031 inches (0.79mm) rated for 100,000 cycles at 85°C only.
4. Available in 10A and lower, ± 0.031 inches (0.79mm) rated for 100,000 cycles at 85°C and 150°C.
5. Available with 0.250 x 0.032" terminals only.

*PCB terminals are lateral to case only.

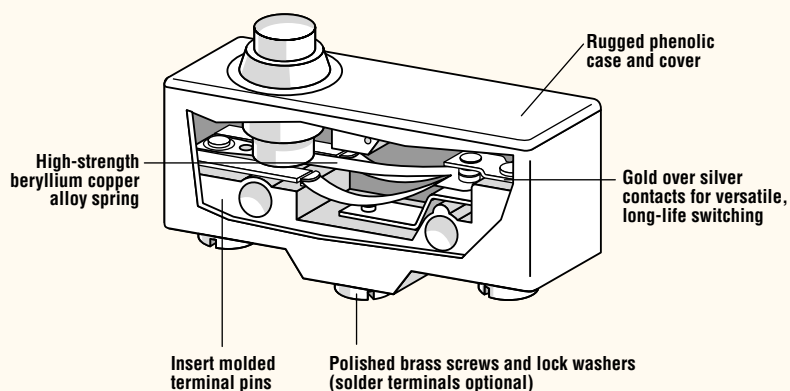
†Available as internal mounting only.

HEAVY-DUTY SNAP ACTION

GP Series

Features

- Ultra-small travel differential
- Mechanical life tested to 1 million cycles
- Current switching to 15 amps
- Wide variety of actuators
- Screw or solder terminals standard
- Low operating forces available



Specifications

Electrical

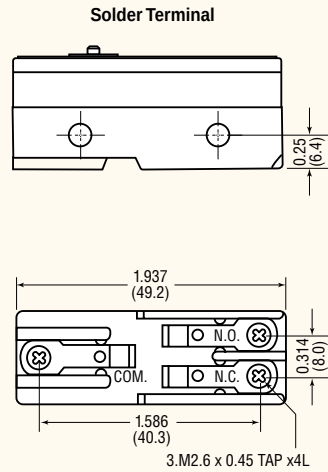
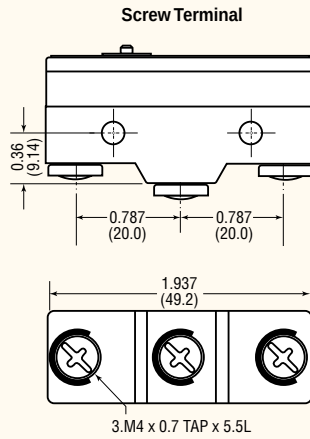
Ratings:	15A, 250VAC (UL) 15A, 250V (VDE)
Dielectric Strength:	1000VAC 50/60Hz for 1 minute
Insulation Resistance:	100M ohms min at 500VDC
Initial Contact Resistance:	15m ohms max
Temperature Range:	-20° to +85°C

Materials

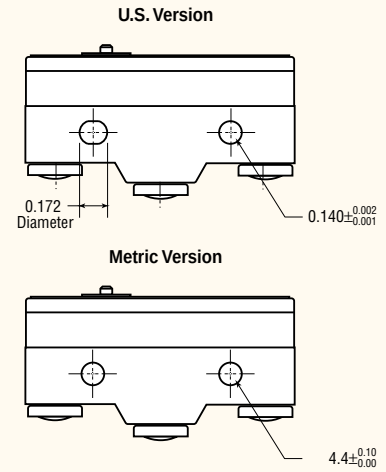
Case:	Phenolic
Cover:	Phenolic
Spring:	Beryllium Copper Alloy
Contacts:	Silver Alloy
Terminals:	Brass Screw Terminals; Copper Alloy Solder Terminals
Lever Actuator:	Stainless Steel



Terminal Types inches (mm)



Mounting Holes



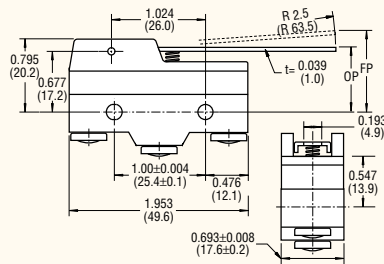
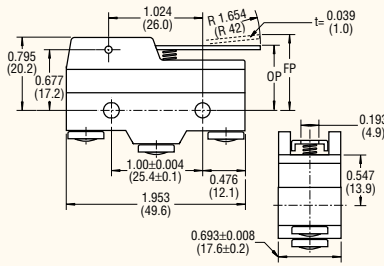
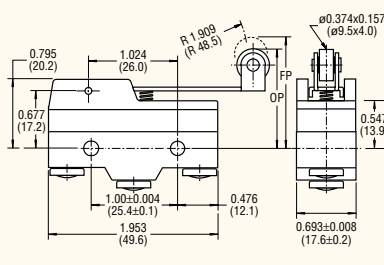
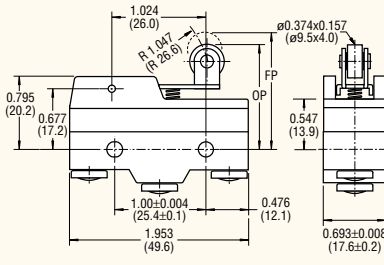
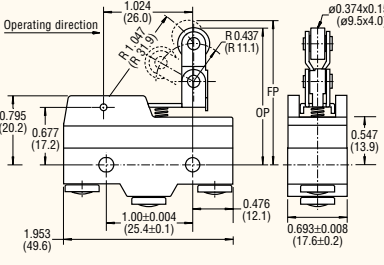
Standard Part Numbers and Descriptions

Dimensions inches (mm)	Part Number	Maximum Operating Force (oz.)	Maximum Pre-Travel inches (mm)	Operating Point Min./Max. inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Minimum Release Force (oz.)	Terminal Type	Mounting Hole
	GPSCNA01	12.3	0.016 (0.41)	0.610/0.642 (15.49/16.31)	0.005 (0.13)	0.002 (0.05)	4.0	Solder	Metric
	GPSCNA11	12.3	0.016 (0.41)	0.610/0.642 (15.49/16.31)	0.005 (0.13)	0.002 (0.05)	4.0	Solder	U.S.
	GPTCNA01	12.3	0.016 (0.41)	0.610/0.642 (15.49/16.31)	0.005 (0.13)	0.002 (0.05)	4.0	Screw	Metric
	GPTCNA11	12.3	0.016 (0.41)	0.610/0.642 (15.49/16.31)	0.005 (0.13)	0.002 (0.05)	4.0	Screw	U.S.
	GPSCLR01	5.3	0.158 (4.01)	0.653/0.717 (16.59/18.22)	0.063 (1.60)	0.002 (0.05)	0.5	Solder	Metric
	GPSCLR11	5.3	0.158 (4.01)	0.653/0.717 (16.59/18.22)	0.063 (1.60)	0.002 (0.05)	0.5	Solder	U.S.
	GPTCLR01	5.3	0.158 (4.01)	0.653/0.717 (16.59/18.22)	0.063 (1.60)	0.002 (0.05)	0.5	Screw	Metric
	GPTCLR11	5.3	0.158 (4.01)	0.653/0.717 (16.59/18.22)	0.063 (1.60)	0.002 (0.05)	0.5	Screw	U.S.
	GPSCRR01	5.3	0.158 (4.01)	1.094/1.158 (27.79/29.41)	0.063 (1.60)	0.002 (0.05)	0.5	Solder	Metric
	GPSCRR11	5.3	0.158 (4.01)	0.653/0.717 (27.79/29.41)	0.063 (1.60)	0.002 (0.05)	0.5	Solder	U.S.
	GPTCRR01	5.3	0.158 (4.01)	0.653/0.717 (27.79/29.41)	0.063 (1.60)	0.002 (0.05)	0.5	Screw	Metric
	GPTCRR11	5.3	0.158 (4.01)	0.653/0.717 (27.79/29.41)	0.063 (1.60)	0.002 (0.05)	0.5	Screw	U.S.

Standard Part Numbers and Descriptions

Dimensions inches (mm)	Part Number	Maximum Operating Force (oz.)	Maximum Pre-Travel inches (mm)	Operating Point Min./Max. inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Minimum Release Force (oz.)	Terminal Type	Mounting Hole
	GPSCND01	12.3	0.016 (0.41)	1.09/1.13 (27.69/28.70)	0.063 (1.60)	0.002 (0.05)	4.0	Solder	Metric
	GPSCND11	12.3	0.016 (0.41)	1.09/1.13 (27.69/28.70)	0.063 (1.60)	0.002 (0.05)	4.0	Solder	U.S.
	GPTCND01	12.3	0.016 (0.41)	1.09/1.13 (27.69/28.70)	0.063 (1.60)	0.002 (0.05)	4.0	Screw	Metric
	GPTCND11	12.3	0.016 (0.41)	1.09/1.13 (27.69/28.70)	0.063 (1.60)	0.002 (0.05)	4.0	Screw	U.S.
	GPSCNC01	12.3	0.016 (0.41)	0.827/0.867 (21.01/22.02)	0.063 (1.60)	0.002 (0.05)	4.0	Solder	Metric
	GPSCNC11	12.3	0.016 (0.41)	0.827/0.867 (21.01/22.02)	0.063 (1.60)	0.002 (0.05)	4.0	Solder	U.S.
	GPTCNC01	12.3	0.016 (0.41)	0.827/0.867 (21.01/22.02)	0.063 (1.60)	0.002 (0.05)	4.0	Screw	Metric
	GPTCNC11	12.3	0.016 (0.41)	0.827/0.867 (21.01/22.02)	0.063 (1.60)	0.002 (0.05)	4.0	Screw	U.S.
	GPSCNH01	12.3	0.016 (0.41)	0.826/0.890 (20.98/22.60)	0.217 (5.51)	0.002 (0.05)	4.0	Solder	Metric
	GPSCNH11	12.3	0.016 (0.41)	0.826/0.890 (20.98/22.60)	0.217 (5.51)	0.002 (0.05)	4.0	Solder	U.S.
	GPTCNH01	12.3	0.016 (0.41)	0.826/0.890 (20.98/22.60)	0.217 (5.51)	0.002 (0.05)	4.0	Screw	Metric
	GPTCNH11	12.3	0.016 (0.41)	0.826/0.890 (20.98/22.60)	0.217 (5.51)	0.002 (0.05)	4.0	Screw	U.S.
	GPSCRH01	12.3	0.016 (0.41)	1.270/1.350 (32.59/34.29)	0.140 (3.56)	0.002 (0.05)	4.0	Solder	Metric
	GPSCRH11	12.3	0.016 (0.41)	1.270/1.350 (32.59/34.29)	0.140 (3.56)	0.002 (0.05)	4.0	Solder	U.S.
	GPTCRH01	12.3	0.016 (0.41)	1.270/1.350 (32.59/34.29)	0.140 (3.56)	0.002 (0.05)	4.0	Screw	Metric
	GPTCRH11	12.3	0.016 (0.41)	1.270/1.350 (32.59/34.29)	0.140 (3.56)	0.002 (0.05)	4.0	Screw	U.S.
	GPSCRH02	12.3	0.016 (0.41)	1.270/1.350 (32.59/34.29)	0.140 (3.56)	0.002 (0.05)	4.0	Solder	Metric
	GPSCRH12	12.3	0.016 (0.41)	1.240/1.320 (32.59/34.29)	0.140 (3.56)	0.002 (0.05)	4.0	Solder	U.S.
	GPTCRH02	12.3	0.016 (0.41)	1.270/1.350 (32.59/34.29)	0.140 (3.56)	0.002 (0.05)	4.0	Screw	Metric
	GPTCRH12	12.3	0.016 (0.41)	1.270/1.350 (32.59/34.29)	0.140 (3.56)	0.002 (0.05)	4.0	Screw	U.S.

Standard Part Numbers and Descriptions

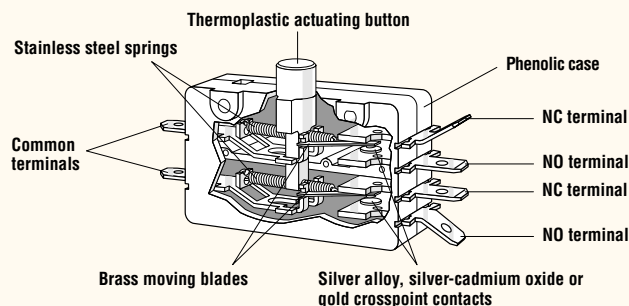
Dimensions inches (mm)	Part Number	Maximum Operating Force (oz.)	Maximum Pre-Travel inches (mm)	Operating Point Min./Max. inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Minimum Release Force (oz.)	Terminal Type	Mounting Hole
	GPSCLS01	2.4	0.394 (10.01)	0.716/0.780 (18.19/19.81)	0.220 (5.59)	0.050 (1.27)	0.5	Solder	Metric
	GPSCLS11	2.4	0.394 (10.01)	0.716/0.780 (18.19/19.81)	0.220 (5.59)	0.050 (1.27)	0.5	Solder	U.S.
	GPTCLS01	2.4	0.394 (10.01)	0.716/0.780 (18.19/19.81)	0.220 (5.59)	0.050 (1.27)	0.5	Screw	Metric
	GPTCLS11	2.4	0.394 (10.01)	0.716/0.780 (18.19/19.81)	0.220 (5.59)	0.050 (1.27)	0.5	Screw	U.S.
	GPSCLS02	3.1	0.315 (8.00)	0.716/0.780 (18.19/19.81)	0.165 (4.19)	0.040 (1.02)	0.7	Solder	Metric
	GPSCLS12	3.1	0.315 (8.00)	0.716/0.780 (18.19/19.81)	0.165 (4.19)	0.040 (1.02)	0.7	Solder	U.S.
	GPTCLS02	3.1	0.315 (8.00)	0.716/0.780 (18.19/19.81)	0.165 (4.19)	0.040 (1.02)	0.7	Screw	Metric
	GPTCLS12	3.1	0.315 (8.00)	0.716/0.780 (18.19/19.81)	0.165 (4.19)	0.040 (1.02)	0.7	Screw	U.S.
	GPSCRS01	3.5	0.280 (7.11)	1.157/1.221 (29.39/31.01)	0.158 (4.01)	0.040 (1.02)	0.8	Solder	Metric
	GPSCRS11	3.5	0.280 (7.11)	1.157/1.221 (29.39/31.01)	0.158 (4.01)	0.040 (1.02)	0.8	Solder	U.S.
	GPTCRS01	3.5	0.280 (7.11)	1.157/1.221 (29.39/31.01)	0.158 (4.01)	0.040 (1.02)	0.8	Screw	Metric
	GPTCRS11	3.5	0.280 (7.11)	1.157/1.221 (29.39/31.01)	0.158 (4.01)	0.040 (1.02)	0.8	Screw	U.S.
	GPSCRM01	5.6	0.106 (2.70)	1.173/1.205 (29.79/30.61)	0.095 (2.41)	0.020 (0.51)	1.4	Solder	Metric
	GPSCRM11	5.6	0.106 (2.70)	1.173/1.205 (29.79/30.61)	0.095 (2.41)	0.020 (0.51)	1.4	Solder	U.S.
	GPTCRM01	5.6	0.106 (2.70)	1.173/1.205 (29.79/30.61)	0.095 (2.41)	0.020 (0.51)	1.4	Screw	Metric
	GPTCRM11	5.6	0.106 (2.70)	1.173/1.205 (29.79/30.61)	0.095 (2.41)	0.020 (0.51)	1.4	Screw	U.S.
	GPTCRG01	5.6	0.106 (2.70)	1.594/1.658 (40.49/42.11)	0.095 (2.41)	0.020 (0.51)	1.4	Solder	Metric
	GPTCRG11	5.6	0.106 (2.70)	1.594/1.658 (40.49/42.11)	0.095 (2.41)	0.020 (0.51)	1.4	Screw	U.S.

GENERAL PURPOSE — SINGLE & DOUBLE POLE

E Series

Features

- 5 current ratings
- Choice of actuator styles
- 3 terminal types (optional screw terminals available — consult factory)
- 3 contact arrangements
- Long-life coil spring mechanism
- High-temperature 150°C and 200°C available on select models (consult factory)



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load According to VDE (Min. Operations)	According to UL (Min. Operations)
E13/E19	N/A	15A, 125/250VAC; 3/4HP, 125VAC 1-1/2HP, 250VAC	N/A	6,000*
E19A (mixed ratings)	N/A	15A, 125/250VAC; 0.1A, 125VAC	N/A	6,000
E14/E25	N/A	25A, 125/250VAC; 1HP, 125VAC 2HP, 250VAC	N/A	6,000
E20	N/A	20A, 125/250VAC; 1HP, 125VAC 2HP, 250VAC	N/A	6,000
E28/E29	N/A	30.1A, 125/250/277VAC (UL Approved Only — Resistive Load Only)	N/A	6,000
E30	N/A	30.1A, 125/250VAC; 1HP, 125VAC 2HP, 250VAC	N/A	6,000
G13/G20	N/A	0.1A, 125VAC	N/A	6,000*

*Indicates 100K life available.

Specifications

Electrical

Temperature Rating:	105°C Std. (150°C and 200°C optional — E13, E14, E19, E20, G13) 85°C Std. (E28 and E29)
Flammability Rating:	UL94HB

Materials

Case:	General Purpose Phenolic
Actuating Button:	Thermoplastic Nylon
Common Terminals:	Brass (E13, E19, E19A, G13, G20) Silver-Plated Brass (E14, E20, E28, E29, E30)
NO and NC Terminals:	Brass (E13, E19, E19A, G13, G20) Copper (E14, E20, E28, E29, E30)
Moving Blade:	Brass (E13, E19, E19A, G13, G20) Silver-Plated Beryllium Copper (E14, E20, E28, E29, E30)
Spring:	Stainless Steel
Auxiliary Actuators:	Cold-Rolled Steel (Nickel-Plated)
Roller:	Sintered Stainless Steel
Contacts:	Gold Crosspoint (G13, G20, E19A) Silver-Cadmium Oxide (E13, E14, E19, E20, E28) Silver Alloy (E19A, E29, E30)

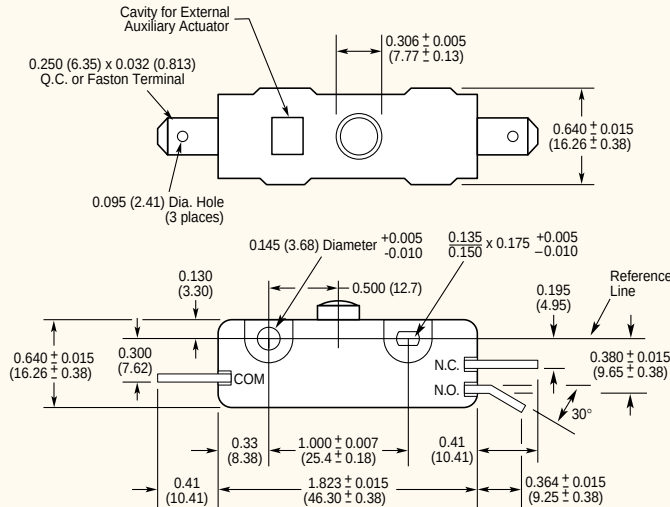


US (E25 only)





Dimensions — Single Pole inches (mm)



Actuator Specifications — Single Pole

Series/ Prefix	Actuator Type	Switch Type	Maximum Operating Force (g)	Maximum Pre-Travel inches (mm)	Operating Point* inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Actuation Length** inches (mm)
E13/G13	-00E		425	0.050 (1.27)	0.285±0.020 (7.24±0.51)	0.100 (2.54)	0.015 (0.38)	—
E14/E29/E30	-00A		850	0.100 (2.54)	0.248±0.026 (6.30±0.66)	0.050 (1.27)	0.015 (0.38)	—
E13/G13	-00J		425	0.050 (1.27)	0.670±0.030 (17.02±0.76)	0.108 (2.74)	0.015 (0.38)	—
E14/E29/E30			850	0.100 (2.54)	0.633±0.030 (16.08±0.76)	0.050 (1.27)	0.015 (0.38)	—
E13/G13	-00M		425	0.050 (1.27)	0.812±0.030 (20.63±0.76)	0.218 (5.54)	0.015 (0.38)	—
E14/E29/E30			850	0.100 (2.54)	0.775±0.030 (19.69±0.76)	0.168 (4.27)	0.015 (0.38)	—
E13/G13	-00H		100	0.250 (6.35)	0.312±0.062 (7.93±1.57)	0.187 (4.75)	0.093 (2.36)	1.500 (38.10)
E14/E29/E30†			285	0.312 (7.93)	0.468±0.062 (11.89±1.57)	0.150 (3.81)	0.050 (1.27)	0.821 (20.85)
E13/G13	-50H		65	0.343 (8.71)	0.281±0.062 (7.14±1.57)	0.187 (4.75)	0.140 (3.56)	1.750 (44.45)
E14/E29/E30†			170	0.525 (13.34)	0.437±0.062 (11.10±1.57)	0.218 (5.54)	0.080 (2.03)	1.071 (27.20)
E13/G13	-00K		100	0.250 (6.35)	0.718±0.062 (18.24±1.57)	0.187 (4.75)	0.093 (2.36)	1.391 (35.33)
E14/E29/E30†			285	0.348 (8.84)	0.860±0.062 (21.84±1.57)	0.130 (3.30)	0.045 (1.14)	0.652 (16.56)
E13/G13	-50K		65	0.343 (8.71)	0.687±0.062 (17.45±1.57)	0.187 (4.75)	0.140 (3.56)	1.645 (41.78)
E14/E29/E30†			170	0.483 (12.27)	0.828±0.062 (21.03±1.57)	0.218 (5.54)	0.073 (1.85)	0.902 (22.91)

* Measured above reference line. Refer to dimensional drawing above. ** Actuator tolerance ±0.031 inches (0.79mm).

† E14, E29 and E30 actuators are shorter and formed up 11° at the button.

Ordering Information

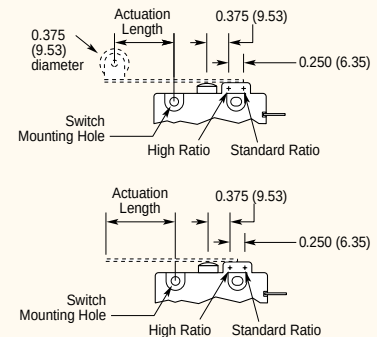
Select the current rating you need.
Combine the corresponding Series/Prefix number with the appropriate suffix number for the switch you need.

Mounting — Single Pole

Recommended mounting screw: #6-32 round head. Recommended torque on screw: 6 inch lbs. max.

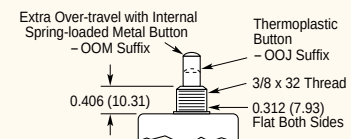
Actuators — Single Pole

Standard type integral hinged lever and roller actuators are available in choice of two mounting positions. Actuation lengths are dimensioned from centerline of switch mounting hole as shown.



“J” & “M” Type Optional Hardware — Single Pole

Brass Hex Nut	0012-0023
Brass Knurled Nut	0012-0025
Brass Hex Nut (Nickel-Pated)	0012-0028
Brass Knurled Nut (Nickel-Pated)	0012-0021
Star Washer	0012-0073



Circuitry — Single Pole

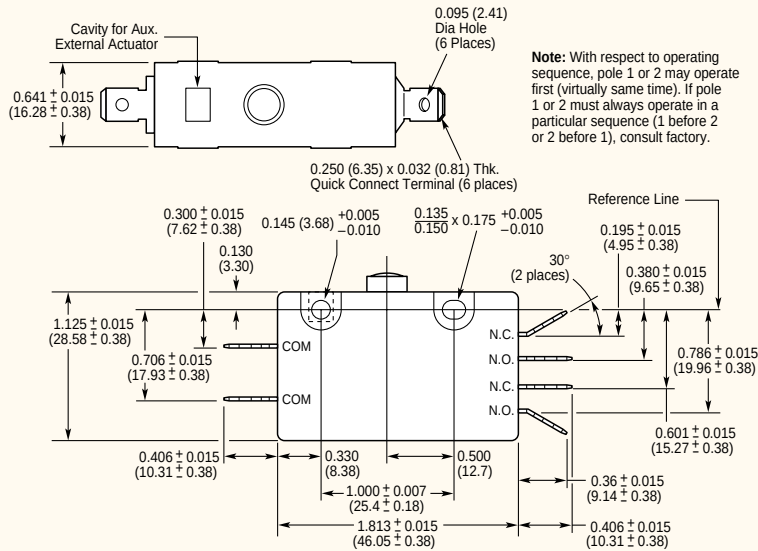
Contact arrangement available in choice of single pole double throw or single pole single throw, either normally open or normally closed. In general, normally open may be specified by changing suffix number from 00 to 01 and normally closed by changing suffix number to 02.

Example: E13-00E is double throw, E13-01E is normally open, and E13-02E is normally closed.

Terminals — Single Pole

Standard 0.250" x 0.032" (6.35mm x 0.81mm) [Optional 0.187" x 0.032" (4.75mm x 0.81mm)] QC terminals can be furnished with angle formed up or down. Forms include straight 30°, 45°, 85° up or down. Other forms can be provided. Screw terminal UL approved on E14 and E30 only.

Dimensions — Double Pole inches (mm)



Actuator Specifications — Double Pole

Series/ Prefix	Actuator Type	Switch Type	Maximum Operating Force (g)	Maximum Pretravel inches (mm)	Operating Point* inches (mm)	Minimum Overtravel inches (mm)	Max. Movement Differential inches (mm)	Actuation Length inches (mm)
E19/G20	-00A		850	0.050 (1.27)	0.285±0.030 (7.24±0.76)	0.080 (2.03)	0.015 (0.38)	—
E20/E28			1280	0.100 (2.54)	0.248±0.030 (6.30±0.76)	0.050 (1.27)	0.015 (0.38)	—
E19/G20	-00J		850	0.050 (1.27)	0.670±0.030 (17.02±0.76)	0.080 (2.03)	0.015 (0.38)	—
E20/E28†			1280	0.100 (2.54)	0.630±0.030 (16.00±0.76)	0.050 (1.27)	0.015 (0.38)	—
E19/G20	-00M		850	0.050 (1.27)	0.812±0.030 (20.62±0.76)	0.218 (5.54)	0.015 (0.38)	—
E20/E28†			1280	0.100 (2.54)	0.774±0.030 (19.66±0.76)	0.188 (4.78)	0.015 (0.38)	—
E19/G20	-00H		205	0.275 (6.99)	0.312±0.062 (7.92±1.57)	0.187 (4.75)	0.093 (2.36)	1.500 (38.10)
E20/E28†			425	0.330 (8.38)	0.468±0.062 (11.89±1.57)	0.156 (3.96)	0.050 (1.27)	0.821 (20.85)
E19/G20	-50H		130	0.400 (10.16)	0.281±0.062 (7.14±1.57)	0.187 (4.75)	0.140 (3.56)	1.750 (44.45)
E20/E28†			285	0.600 (15.24)	0.437±0.062 (11.10±1.57)	0.156 (3.96)	0.080 (2.03)	1.071 (27.20)
E19/G20	-00K		212	0.250 (6.35)	0.718±0.062 (18.24±1.57)	0.187 (4.75)	0.093 (2.36)	1.391 (35.33)
E20/E28†			425	0.348 (8.84)	0.860±0.062 (21.84±1.57)	0.156 (3.96)	0.045 (1.14)	0.652 (16.56)
E19/G20	-50K		150	0.312 (7.92)	0.687±0.062 (17.45±1.57)	0.187 (4.75)	0.140 (3.56)	1.645 (41.78)
E20/E28†			312	0.525 (13.34)	0.828±0.062 (21.03±1.57)	0.146 (3.71)	0.075 (1.91)	0.902 (22.91)

* Measured above reference line. Refer to dimensional drawing above. ** Actuator tolerance ±0.031 inches (0.79mm).

† E20 and E28 actuators are shorter and formed up 15° at the button.

Contact factory for E25 specifications.

Ordering Information

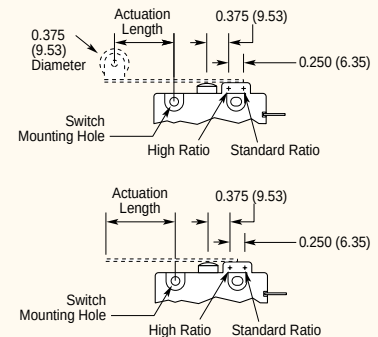
Select the current rating you need. Combine the corresponding Series/Prefix number with the appropriate suffix number for the switch you need. Note: Consult factory for part number when ordering E19A switches.

Mounting — Double Pole

Recommended mounting screw: #6-32 round head. Recommended torque on screw: 6 inch lbs. max.

Actuators — Double Pole

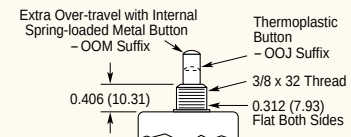
Standard type integral hinged lever and roller actuators are available in choice of two mounting positions. Actuation lengths are dimensioned from centerline of switch mounting hole as shown.



"J" & "M" Type

Optional Hardware — Double Pole

Brass Hex Nut	0012-0023
Brass Knurled Nut	0012-0025
Brass Hex Nut (Nickel-Plated)	0012-0028
Brass Knurled Nut (Nickel-Plated)	0012-0021
Star Washer	0012-0073



Circuitry — Double Pole

Contact arrangement available in choice of single pole double throw or single pole single throw, either normally open or normally closed. In general, normally open may be specified by changing suffix number from 00 to 01 and normally closed by changing suffix number to 02.

Example: E19-00A is double throw, E19-01A is normally open, and E19-02A is normally closed.

Terminals — Double Pole

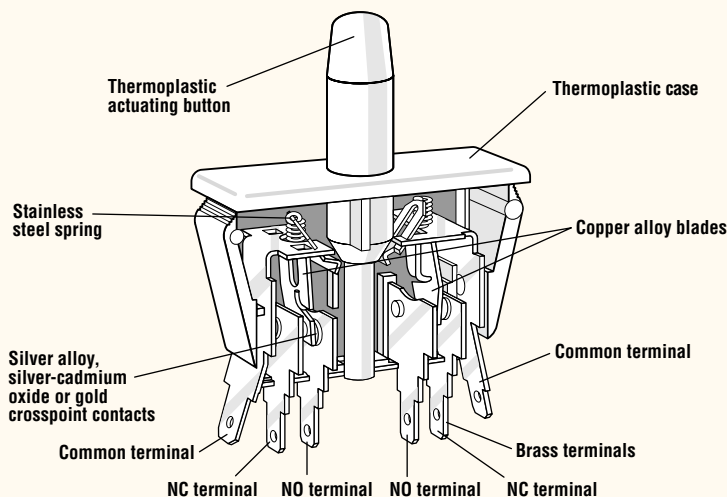
Standard 0.250" x 0.032" (6.35mm x 0.81mm) [Optional 0.187" x 0.032" (4.75mm x 0.81mm)] QC terminals can be furnished with angle formed up or down on common as well as open or closed terminal. Forms include straight 30°, 45°, 85° up or down. Other forms can be provided.

PANEL MOUNT PUSHBUTTON — SINGLE & DOUBLE POLE

E Series

Features

- Choice of Momentary, Push-Pull (reset) and Cheat Interlock switches
- Snap-in panel mounting
- Long-life coil spring, snap-action mechanism
- Agency approved extended-life versions available
- VDE approval available on select models (F Series)
- Various terminal forms available (consult factory)



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
E65	N/A	16A, 125/250VAC; 1/3HP, 125/250VAC	N/A	6,000
E/F68	0.1(0.05)A, 125VAC	0.1A, 125VAC	50,000	6,000*
E/F69	10(4)A, 250VAC	10A, 125/250VAC; 1/3HP, 125/250VAC	50,000	6,000*
E/F77	0.1(0.05)A, 125VAC 10(4)A, 250VAC	0.1A, 125VAC; 10A, 1/3HP, 125/250VAC	50,000	6,000*
E/F78	0.1(0.05)A, 125VAC	0.1A, 125VAC	50,000	6,000*
E/F79	10(4)A, 250VAC	10A, 125/250VAC; 1/3HP, 125/250VAC	50,000	6,000*
E75	N/A	16A, 125/250VAC; 1/3HP, 125/250VAC	N/A	6,000

*Indicates 100K life available.

Specifications

Electrical

Temperature Rating: -40° to +85°C

Flammability Rating: UL94V-O

Materials

Case: Thermoplastic Polyester (*Valox used on International versions*)

Actuating Button: Thermoplastic Acetal (*Valox used on International versions*)

Terminals*: Brass

Moving Blade: Beryllium Copper

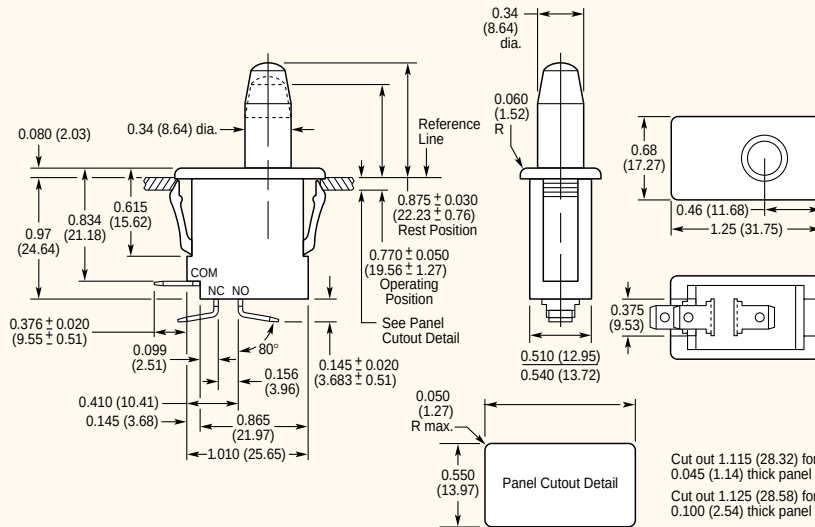
Spring: Stainless Steel

Contacts: Silver Alloy (E65, E/F69)
Silver-Cadmium Oxide (E75, E/F77, E/F79)
Gold Crosspoint (E/F68, E/F77)

*Common terminals are plated — the remaining two terminals are not plated.



Dimensions — Single Pole inches (mm)



Actuator Specifications — Single Pole

Actuator Type	Switch Type	Rest Position inches (mm)	Maximum Pre-Travel inches (mm)	Operating Point* inches (mm)	Minimum Over-Travel inches (mm)	Max. Movement Differential inches (mm)	Maximum Operating Force** (g)	Maximum Full Overtravel Position inches (mm)
<i>Basic Momentary Action</i>								
-00A		0.845–0.905 (21.46–22.99)	0.125 (3.18)	0.720–0.820 (18.29–20.83)	0.375 (9.53)	0.045 (1.14)	425	0.400 (10.16)
<i>Push-Pull (Reset)</i>								
-20A		0.920–0.980 (22.37–24.89)	0.150 (3.81)	0.800–0.900 (20.32–22.86)	0.300 (7.62)	0.045 (1.14)	285	0.500 (12.70)
<i>Momentary</i>								
-30A [†]		0.730–0.790 (18.54–20.07)	0.125 (3.18)	0.610–0.710 (15.49–18.03)	0.100 (2.54)	0.045 (1.14)	475	0.520 (13.21)
<i>"Cheat Interlock" (Pull out to lock)</i>								
		0.730–0.790 (18.54–20.07)	0.125 (3.18)	0.800–0.900 (20.32–22.86)	0.050 (1.27)	0.060 (1.52)	385	0.980 (24.89)
<i>Short Button Momentary</i>								
-40A		0.420–0.480 (10.67–12.19)	0.125 (3.18)	0.300–0.400 (7.62–10.16)	0.175 (4.45)	0.045 (1.14)	425	0.125 (3.18)
<i>For Auxiliary Push Button</i>								
-50A		0.420–0.480 (10.67–12.19)	0.125 (3.18)	0.300–0.400 (7.62–10.16)	0.175 (4.45)	0.045 (1.14)	425	0.125 (3.18)

*Measured above reference line. Refer to dimensional drawing above.

**Operating Forces listed above are for E68/E69 switches only. E65 Operating Force: 708 grams max. for momentary switches.

[†]Dual function switch: Push in to operate in normal momentary mode and pull out for maintained action.

Ordering Information

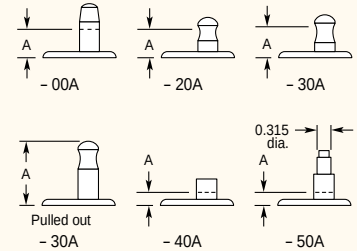
Select the current rating you need.
Combine the corresponding Series/Prefix number with the appropriate suffix number for the switch type, circuitry and terminals you require. Example: SPDT: E68–30A, SPST NO: E68–31A, SPST NC: E68–32A.

Auxiliary Buttons — Single Pole

–50A has button with special shaft to accept auxiliary push buttons for manual actuation. Consult factory for auxiliary buttons.

Button Detail — Single Pole

"A" dimension (full overtravel position)



Circuitry — Single Pole

Double throw or single throw versions available.

Single Pole Series:

E65, E68/F68, E69/F69

Terminals — Single Pole

This switch series has 0.187" x 0.020" (4.75mm x 0.51mm) as standard for up to 10 amps and 0.250" x 0.032" (6.35mm x 0.81mm) for 16 amps.

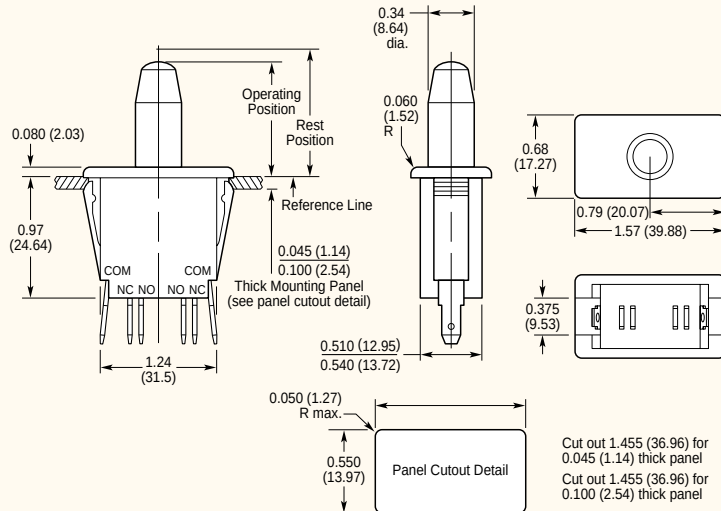
Consult factory for non-standard terminal options.

International Versions — Single Pole

For VDE applications, standard terminals are 0.187" x 0.032" (4.75mm x 0.81mm). Switch prefix must be "F" for VDE approved switches. Example: F68–30A was E68–30A.



Dimensions — Double Pole inches (mm)



Actuator Specifications — Double Pole

Actuator Type	Switch Type	Rest Position inches (mm)	Maximum Pre-Travel inches (mm)	Operating Point* inches (mm)	Minimum Overtravel inches (mm)	Max. Movement Differential inches (mm)	Maximum Operating Force** (g)	Max. Full Over-Travel Position inches (mm)
<i>Basic Momentary Action</i>								
-00A		0.845-0.905 (21.46-22.99)	0.125 (3.18)	0.720-0.820 (18.29-20.83)	0.375 (9.53)	0.075 (1.91)	680	0.400 (10.16)
<i>Push-Pull (Reset)</i>								
-20A		0.920-0.980 (23.37-24.89)	0.150 (3.81)	0.800-0.900 (20.32-22.86)	0.300 (7.62)	0.075 (1.91)	510	0.500 (12.70)
<i>Momentary</i>								
-30A†		0.730-0.790 (18.54-20.07)	0.125 (3.18)	0.610-0.710 (15.49-18.03)	0.100 (2.54)	0.075 (1.91)	757	0.520 (13.21)
<i>"Cheat Interlock" (Pull out to lock)</i>								
		0.730-0.790 (18.54-20.07)	0.155 (3.94)	0.800-0.900 (20.32-22.86)	0.030 (0.76)	0.090 (2.29)	567	0.980 (24.89)
<i>Short Button Momentary</i>								
-40A		0.420-0.480 (10.67-12.19)	0.125 (3.18)	0.300-0.400 (7.62-10.16)	0.175 (4.45)	0.075 (1.91)	680	0.125 (3.18)
<i>For Auxiliary Push Button</i>								
-50A		0.420-0.480 (10.67-12.19)	0.125 (3.18)	0.300-0.400 (7.62-10.16)	0.175 (4.45)	0.075 (1.91)	680	0.125 (3.18)

*Measured above reference line. Refer to dimensional drawing above.

**Operating Forces listed above are for E78/E79 switches only. E75 Operating Force: 921 grams max. for momentary switches.

†Dual function switch: Push in to operate in normal momentary mode and pull out for maintained action.

Ordering Information

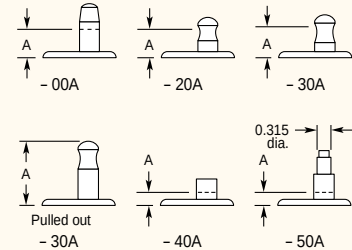
Select the current rating you need.
Combine the corresponding Series/Prefix number with the appropriate suffix number for the switch type, circuitry and terminals you require. Example: DPDT: E78-30A, DPST NO: E78-31A, DPST NC: E78-32A.

Auxiliary Buttons — Double Pole

-50A has button with special shaft to accept auxiliary push buttons for manual actuation. Consult factory for auxiliary buttons.

Button Detail — Double Pole

"A" dimension (full overtravel position)



Circuitry — Double Pole

Double throw or single throw versions available.

Double Pole Series:

E77/F77, E78/F78, E79/F79, E75

Terminals — Double Pole

This switch series has 0.187" x 0.020" (4.75mm x 0.51mm) as standard for up to 10 amps and 0.250" x 0.032" (6.35mm x 0.81mm) for 16 amps.

Consult factory for non-standard terminal options.

International Versions — Double Pole

For VDE applications, standard terminals are 0.187" x 0.032" (4.75mm x 0.81mm).

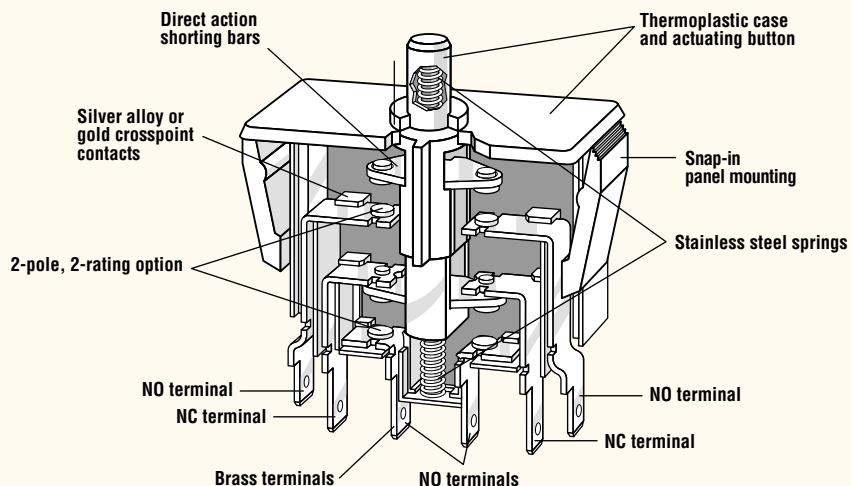
Switch prefix must be "F" for VDE approved switches. Example: F78-30A was E68-30A.

LINE INTERRUPT

F80 Series

Features

- Snap-in panel mounting
- High overtravel
- Choice of button barrier or standard housing
- 3 terminal types
- Double make/double break shorting bars
- Agency approved extended-life versions available
- International approval available
- 3mm (0.12") minimum contact gaps
- Over 200 versions available



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
F81	10(3)A, 400VAC	10A, 125/250VAC, 3/4HP, 125VAC 1-1/2HP, 250VAC; 6A, 30VDC	50,000	6,000*
F82	16(6)A, 250VAC	16A, 125/250VAC, 3/4HP, 125VAC 1-1/2HP, 250VAC; 6A, 30VDC	50,000	6,000*
F83	0.1(0.5)A, 250VAC	0.1A, 125/250VAC	50,000	6,000*
F84	Mixed Ratings Consult Factory	Combines two different ratings in a single switch. Consult factory for special part number.	50,000	6,000*

*Indicates 100K life available.

Specifications

Electrical

Temperature Rating:	-25° to +85°C
Flammability Rating:	UL94V-O

Materials

Case:	Thermoplastic Polyester
Actuating Button:	Thermoplastic Polyester
Terminals:	Brass
Moving Blade:	Brass
Springs:	Stainless Steel
Guide Pin:	Thermoplastic Nylon
Contacts:	Silver Alloy (F81, F82) Gold Crosspoint (F83) Silver Alloy/Gold Crosspoint (F84)

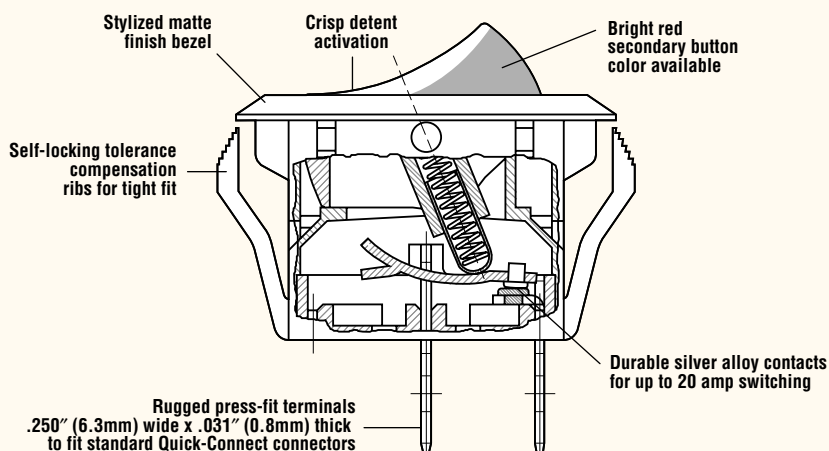


POWER ROCKER SWITCH

CR Series

Features

- Rugged design with current switching up to 20 amps
- 2-color molded button available for maximum visibility
- Lighted and non-lighted versions
- Splash-proof option available
- Available in a wide variety of colors
- Fits to 3 panel cut-out widths
- Mechanical life: min. 100,000 operations



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
CR	16(4)A, 250V~, T125	20A, 125VAC; 16A, 250VAC; 3/4HP, 250VAC	10,000	6,000

Specifications

Electrical

Dielectric Strength:	1000VAC for 1 minute
Insulation Resistance:	10 ⁸ ohms min at 500VDC
Initial Contact Resistance:	0.020 ohms max
Temperature Range:	-20°C to +85°C

Materials

Actuator (non-lighted):	Nylon 66 94V-2
Actuator (lighted):	Polycarbonate
Housing:	Nylon 66 94V-2
Case:	Nylon 66 94V-2
Spring:	Steel Wire
Contacts:	Silver Alloy
Movable Arm:	Silver-Plated Copper Alloy
Terminals:	Tin-Plated Copper Alloy

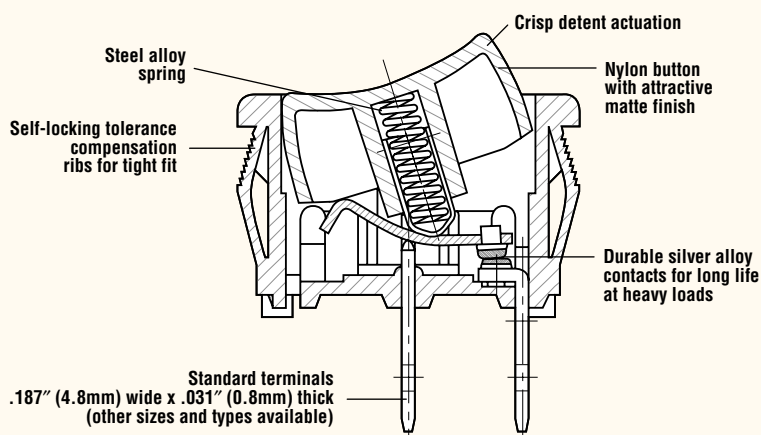


MINIATURE ROCKER SWITCH

SR Series

Features

- 10 or 20 amp switching in a miniature package
- Single-throw and double-throw options
- Choice of actuator and housing color
- Variety of terminals available
- Industry-standard mounting dimensions
- Mechanical life: min. 100,000 operations



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
SR	10(4)A, 250V~, μ T85	10A, 125VAC; 6A, 250VAC	10,000	6,000

Specifications

Electrical

Dielectric Strength:	1000VAC for 1 minute
Insulation Resistance:	10^8 ohms min at 500VDC
Initial Contact Resistance:	0.020 ohms max
Temperature Range:	-20°C to +85°C

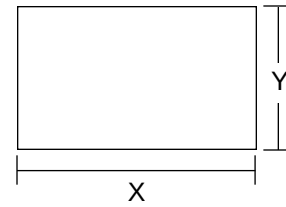
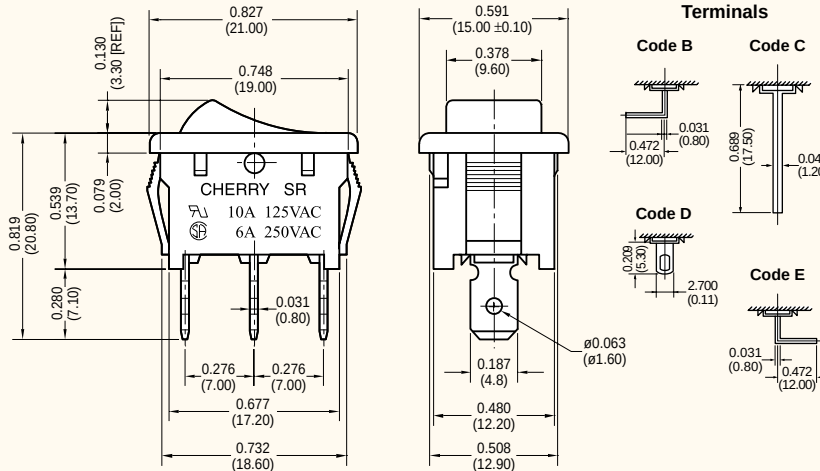
Materials

Actuator:	Nylon 66 94V-2
Case:	Nylon 66 94V-2
Spring:	Steel Wire
Contacts:	Silver or Copper Alloy
Movable Arm:	Silver-Plated Copper Alloy
Terminals:	Tin-Plated Copper Alloy





Dimensions inches (mm)



Z = Panel Thickness

Recommended Panel Cut-Out Dimensions inches (mm)

Dim. Z	Dim. X	Dim. Y
0.030 to 0.049 (0.75 to 1.25)	0.752 (19.10)	0.508 (12.90)
0.049 to 0.079 (1.25 to 2.00)	0.760 (19.30)	0.508 (12.90)
0.079 to 0.118 (2.00 to 3.00)	0.775 (19.76)	0.508 (12.90)

Examples of Common Part Numbers and Descriptions inches (mm)

Part Number	Circuitry	Switch Function	Terminal Type	Actuator/ Housing Color	Legend Marking
SRB22A2FBBNN		On – Off	0.187 (4.8) Quick-Connect	Black/Black	
SRB22A2BBBNN		On – Off	0.187 (4.8) Quick-Connect	Black/Black	
SRB22A2DBBNN		On – Off	0.187 (4.8) Quick-Connect	Black/Black	
SRB23A2BBBNN		On – On	0.187 (4.8) Quick-Connect	Black/Black	
SRB24A2HBBNN		On – Off – On	0.187 (4.8) Quick-Connect	Black/Black	

Boot #0015-0644

Ordering Information

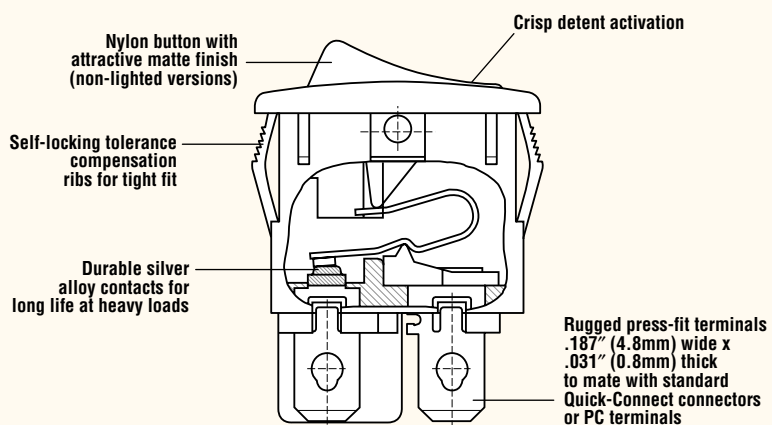
SR	B	2	4	A	2	H	B	B	N	N
Series	Code	Circuitry	Code	Switch Function	Code	Actuator Type	Code	Housing Color	Code	Lighted
	2	Single-Pole	2	On – Off	2	Curve	B	Black	N	Non-Lighted
			3	On – On			W	White		
			4	On – Off – On			Y	Grey		
			5	(On) – Off			C	Brown		
Code	Contact Rating	Code	Terminal Type	inches (mm)	Code	Actuator Marking	Code	Actuator Color	Code	Splashproof
B	10A, 125VAC 6A, 250VAC (UL, CSA) 10(4)A, 250V~, μT85 (VDE)	A	0.187 (4.8) QC		B	Blank	B	Black	N	No Rocker Boot
J	20A, 125VAC (UL, cUL)	B	PC Thru-Hole Left Angle		C		R	Red	S	Waterproof Boot
		C	PC Thru-Hole Straight		D		W	White		
		E	PC Thru-Hole Right Angle		E		Y	Grey		
		P	0.346 x 0.189 (8.79 x 4.80) Solder Tag		F		C	Brown		
					G					
					H					

MINIATURE ROCKER SWITCH

LR Series

Features

- Single-pole and double-pole configurations
- Lighted and non-lighted options
- Available in a wide variety of colors
- High current switching in a compact package
- Variety of terminal styles available
- Self-locking tabs to fit industry-standard panel cut-outs
- Mechanical life: min. 100,000 operations



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
LR	10(4)A, 250V~, T125/55	10A, 125VAC; 8A, 250VAC; 1/4HP, 125/250VAC	10,000	6,000

Specifications

Electrical

Dielectric Strength:	1000VAC for 1 minute
Insulation Resistance:	10 ⁸ ohms min at 500VDC
Initial Contact Resistance:	0.020 ohms max
Temperature Range:	-20°C to +85°C

Materials

Actuator (non-lighted):	Nylon 66 94V-2
Actuator (lighted):	Polycarbonate
Case:	Nylon 66 94V-2
Contacts:	Silver Alloy
Movable Arm:	Copper Alloy
Terminals:	Tin-Plated Copper Alloy

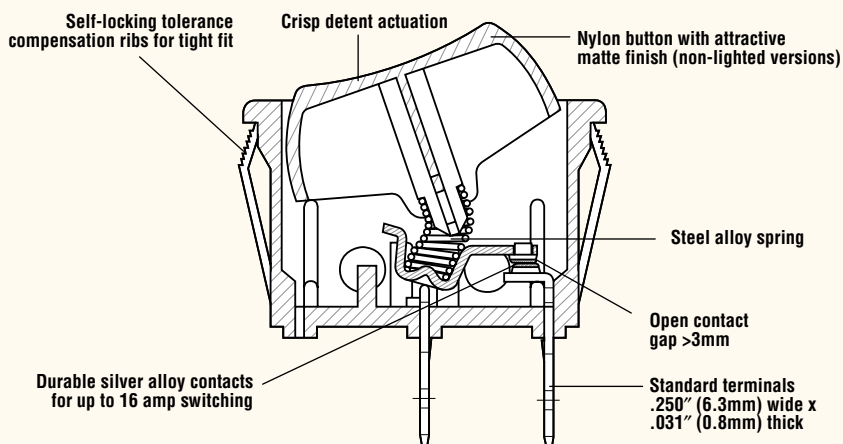


THIN POWER ROCKER SWITCH

TR Series

Features

- 16A switching in 11mm wide package
- Lighted and non-lighted versions
- Available in a wide variety of colors
- Double-throw and three-position versions available
- Fits industry-standard cut-outs
- Mechanical life: min. 50,000 operations



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
TR	16(4)A, 250V~, T85 1E4	16A, 125/250VAC, 1/4HP@125V; 3/4HP@250V	10,000	6,000

Specifications

Electrical

Dielectric Strength:	1000VAC for 1 minute
Insulation Resistance:	10 ⁸ ohms min at 500VDC
Initial Contact Resistance:	0.020 ohms max
Temperature Range:	-20°C to +85°C

Materials

Actuator (non-lighted):	Nylon 66 94V-2
Actuator (lighted):	Polycarbonate
Case:	Nylon 66 94V-2
Spring:	Steel Wire
Contacts:	Silver Alloy
Movable Arm:	Silver-Plated Copper Alloy
Fixed Contact Terminals:	Tin-Plated Copper Alloy

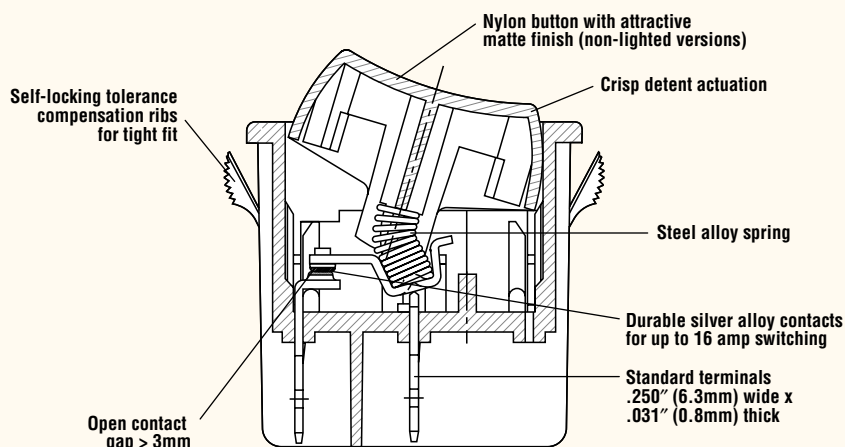


DOUBLE-POLE POWER ROCKER SWITCH

WR Series

Features

- Rugged construction for 2-pole, high-current applications
- Lighted and non-lighted
- Maintained-action and momentary
- Single-throw and double-throw
- Available in a variety of colors
- Mechanical life: min. 50,000 operations



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
WR	16(4)A, 250V~, T125 1E4	16A, 125/250VAC; 1/4HP@125V: 3/4HP@250V	10,000	6,000

Specifications

Electrical

Dielectric Strength:	1000VAC for 1 minute
Insulation Resistance:	10 ⁸ ohms min at 500VDC
Initial Contact Resistance:	0.020 ohms max
Temperature Rating:	-20°C to +85°C

Materials

Actuator (non-lighted):	Nylon 66 94V-2
Actuator (lighted):	Polycarbonate
Case:	Nylon 66 94V-2
Spring:	Steel Wire
Contacts:	Silver Alloy
Movable Arm:	Silver-Plated Copper Alloy
Terminals:	Tin-Plated Copper Alloy

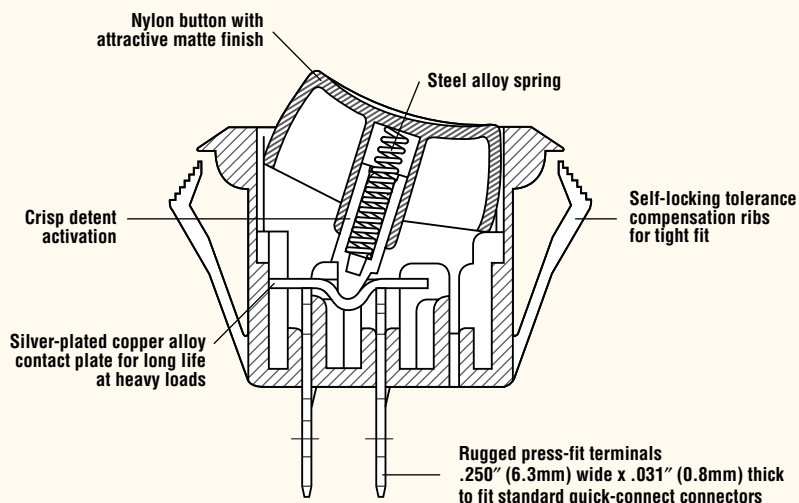


COMPACT ROCKER SWITCH

GR Series

Features

- Economical 15 amp switching
- Lighted and non-lighted versions
- Available in a wide variety of colors
- Single- and double-throw options
- Optional wire leads available
- Mechanical life: min. 50,000 operations



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
GR	N/A	15A, 125VAC; 10A, 250VAC	N/A	6,000

Specifications

Electrical

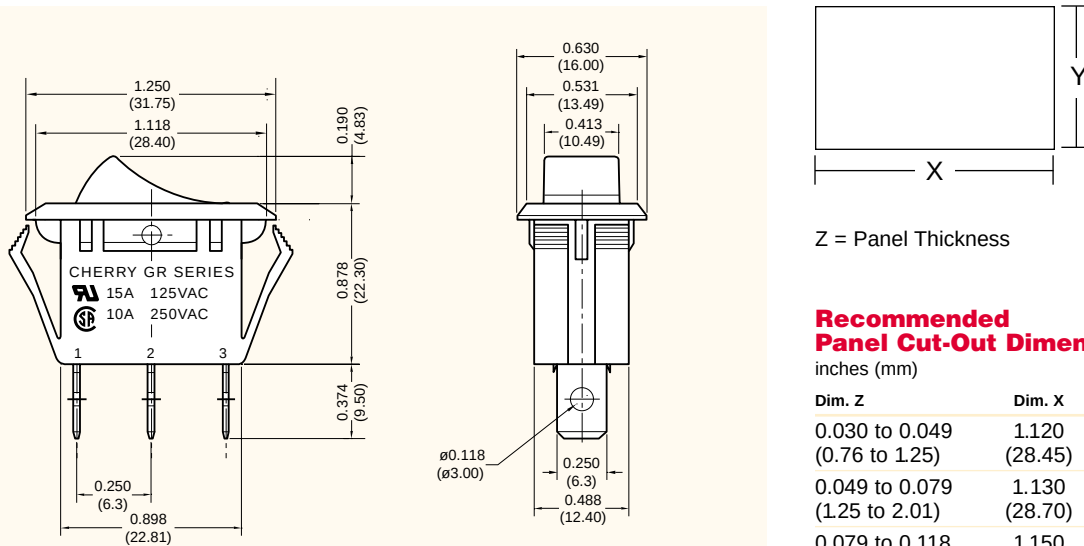
Dielectric Strength:	1000VAC for 1 minute
Insulation Resistance:	10 ⁸ ohms min at 500VDC
Initial Contact Resistance:	.020 ohms max
Temperature Range:	-20°C to +85°C

Materials

Actuator (non-lighted):	Nylon 66 94V-2
Actuator (lighted):	Polycarbonate
Housing:	Nylon 66 94V-2
Base:	Nylon 66 94V-2
Spring:	Steel Wire
Contact Plate:	Copper Alloy
Terminals:	Tin-Plated Copper Alloy



Dimensions inches (mm)



Recommended Panel Cut-Out Dimensions inches (mm)

Dim. Z	Dim. X	Dim. Y
0.030 to 0.049 (0.76 to 1.25)	1.120 (28.45)	0.535 (13.59)
0.049 to 0.079 (1.25 to 2.01)	1.130 (28.70)	0.535 (13.59)
0.079 to 0.118 (2.01 to 3.00)	1.150 (29.21)	0.535 (13.59)

Examples of Common Part Numbers and Descriptions inches (mm)

Part Number	Circuitry	Switch Function	Terminal Type	Actuator/ Housing Color	Legend Marking
GRF22N2BBBNN		On – Off	0.250 (6.3) Quick-Connect	Black/ Black	
GRF22N2FBBNN		On – Off	0.250 (6.3) Quick-Connect	Black/ Black	
GRF23N2BBBNN		On – On	0.250 (6.3) Quick-Connect	Black/ Black	
GRF22N2BBRLN		On – Off/Lighted	0.250 (6.3) Quick-Connect	Red/ Black	

Ordering Information

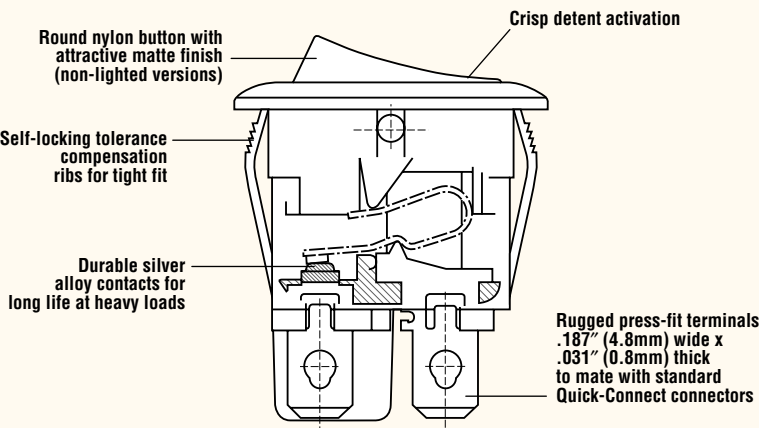
GR Series	F Code F 15A, 125VAC (UL, CSA) 10A, 250VAC (UL, CSA)	2 Code 2 Single-Pole	2 Code 2 On – Off 3 On – On	N Code 2 Curve	F Code B Blank C LO HI D HO NO E O I F O — K OFF ON	B Code B Black W White Y Grey C Brown	B Code B Black G Green A Amber R Red Y Grey C Brown M Yellow W White	N Code N Non-Lighted L Lighted (Bulb 125VAC) E Lighted (Bulb 250VAC) G Lighted 6VDC Incandescent H Lighted 12VDC Incandescent	N Code N No Splashproof Rocker Boot
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ROUND ROCKER SWITCH

RR Series

Features

- Single-pole and double-pole configurations
- Lighted and non-lighted options
- Available in a wide variety of colors
- High current switching in a compact round package
- Self-locking tabs to fit industry-standard panel cut-outs
- Mechanical life: min. 100,000 operations



Electrical Ratings

Switch Series	EN61058 Rating	UL1054 Rating	Electrical Life at Rated Load	
			According to VDE (Min. Operations)	According to UL (Min. Operations)
RR	10(4)A, 250V~, μ T125/55	10A, 125VAC; 8A, 250VAC, 1/4 HP; 125/250VAC	10,000	6,000

Specifications

Electrical	
Dielectric Strength:	1000VAC for 1 minute
Insulation Resistance:	10 ⁸ ohms min at 500VDC
Initial Contact Resistance:	.020 ohms max
Temperature Range:	-20°C to +85°C
Materials	
Actuator (non-lighted):	Nylon 66 94V-2
Actuator (lighted):	Polycarbonate
Base:	Nylon 66 94V-2
Contacts:	Silver Alloy
Movable Arm:	Copper Alloy
Terminals:	Tin-Plated Copper Alloy



SELECTOR SWITCHES

Pushwheel

PUSHWHEEL SELECTOR SWITCH

PA Series

Features

- Very small dimensions: 0.3 x 0.6 x 0.7" (7.62 x 15 x 18mm); Mounting depth: 0.9" (24mm) or 1.4" (34.5mm)
- 10 or 16 switching positions
- Front Mounting
- Integrated pins for module mounting
- Integrated snap-in endcaps



- Black housing
- Extended PCB available for mounting additional components
- Connection using QC terminal or solder pins

PUSHWHEEL SELECTOR SWITCH

PE Series

Features

- Dimensions: 0.3 x 0.9 x 1.0" (7.62 x 24 x 26mm); Mounting depth: 1.3" (32mm) or 1.7" (42mm)
- Standard selector switch with 10 or 16 switching positions
- Front mounting
- Integrated pins for module mounting
- Integrated snap-in endcaps



- Black housing
- Extended PCB available for mounting additional components
- Connection using QC terminal or solder pins

PUSHWHEEL SELECTOR SWITCH

PB Series

Features

- Dimensions: 0.2 x 0.7 x 0.6" (6 x 18 x 15.6mm); Mounting depth: 0.8" (19.5mm)
- 10 switching positions
- Housing only 0.2" (6mm) wide
- Front mounting
- Integrated pins for module mounting



- Integrated snap-in endcaps
- Black housing
- Connection using solder pins

DESKTOP AND NOTEBOOK PROFILE

Keyswitches

LOW NOTEBOOK PROFILE

ML Series

Features

- 0.272" (6.9mm) from PCB (no keycap)
- 3mm travel
- Long life: 20 million operations minimum
- 12V maximum AC/DC
- Current rating: 100μA min., 10μA max.
- Insulation Resistance: <100MΩ



DESKTOP PROFILE

MX Series

Features

- 0.060" (15.2mm) from PCB (no keycap)
- Choice of feel: Linear, soft tactile or click tactile
- PCB or frame mount
- Long life: 50 million operations (linear) and 20 million operations minimum (tactile)
- 4mm travel
- LED, diode or jumper option
- 12V maximum AC/DC
- Current rating: 10mA
- Insulation Resistance: <100MΩ@100VDC



ADDITIONAL

Switch Products

LIGHTED PUSHBUTTON

L4 Series

Features

- Standard or recessed buttons
- Lighted or non-lighted
- Icons and legends
- Variety of lens cap colors
- Chrome or brass plating on bezel at nominal charge
- Other styles available. Contact factory.



SUB-SUBMINIATURE

CS Series

Features

- 5mm stroke and 4mm over-travel give designers large mechanical margin
- Sliding contact technology ensures high reliability
- Snap-in panel mounting or PC board mounting
- Easy connection by a connector (snap-in panel mounting type)



LINE INTERRUPT

DD Series

Features

- Small size
- Low operation force
- Meets UL 1950
- Dielectric strength: 2000VAC
- Various terminal and actuator types
- Double return springs
- 3mm minimum contact gap
- Double make contact bar



TWO-CIRCUIT LINE INTERRUPT

FA Series

Features

- Compact size
- Low operating force
- Long stroke
- Snap in panel mounting
- Three-circuit model available



TERMINATOR

DN Series

Features

- Plug-in termination saves time and money
- Mates with standard 0.025" (0.64mm) square pin connectors on 0.100" (2.54mm) centers (Example: Molex 50-57-9402)
- Three methods of mounting: Traditional screw mount, Vertical snap-in mount and Horizontal snap-in mount
- Long life coil spring mechanism
- Two current ratings
- SPST NO



THREE-CIRCUIT LINE INTERRUPT

F85 Series

Features

- Meets UL 1950
- 8mm contact gap (4mm/side)
- Snap in panel mounting
- Agency approved extended life versions available



TECHNICAL SECTION

Glossary

Actuation Force

Force measured exactly when switch changes state; when the actuator is moved from rest to operating position.

Auxiliary Actuator

An external switch component that will increase travel and/or reduce the actuating force.

Actuation Length

The external actuator's dimension from the round (versus elongated) mounting hole to the actuation line.

Break-Before-Make

This term is used in connection with contacts where the moving contact, in transferring from one position to another, interrupts one circuit before establishing the next.

Contact

In devices used for making and breaking electrical currents, the component that disengages to cause the actual circuit rupture.

Contact Configuration

A desired arrangement of contacts/circuits. See switch abbreviations, forms and poles.

Contact Gap

The distance between a pair of open contacts.

Contact Pressure

Contact pressure is the amount of force holding the movable and stationary contacts together. While this should be termed **Contact Force**, by convention in the United States, it is called Contact Pressure.

Contact Resistance

The junction resistance between two contacts, but usually measured at contact terminals. It includes the terminal resistance. Measuring volts and amps should be similar to intended application.

Contact Wipe

Sliding of one contact over another during actuation of switch.

Crosspoint

Gold contact prisms are welded at right angles to each other providing maximum contact pressure and minimum hazard of contact closure interference. Used exclusively for low energy switching.

Dielectric Strength

The property of an insulating material which determines the maximum potential gradient that the material can withstand without rupture.

Double Break

A form of switch contact construction in which a current carrying member bridges a gap at two adjacent points, one at each end of the bridging member.

Form A

A single pole, single throw, normally open contact or SPST NO.

Form B

A single pole, single throw, normally closed contact or SPST NC.

Form C

A single pole double throw contact or SPDT.

2-Form C

A double pole, double throw contact or DPDT.

High Ratio Position

The actuator mounting position closest to the switch button.

Make

A term used to indicate that a switch has completed the dynamics of closing an electrical circuit.

Momentary Action

The circuit is either opened or closed, only as long as the switch is actuated.

Normally Open

A term used to describe contacts that are open in the rest position.

Normally Closed

A term used to describe contacts which establish a circuit when in the rest position.

Poles

The number of separate circuits that can be activated through a switch at any one time.

Reference Line

Also known as datum line. Used as a basis for calculating the operating characteristics of a switch.

Standard Ratio Position

The actuator mounting position furthest from the switch button.

Switch Abbreviations

SPST: Single pole single throw
SPDT: Single pole double throw
DPST: Double pole single throw
DPDT: Double pole double throw
3PDT: Three pole double throw
4PDT: Four pole double throw
5PDT: Five pole double throw

Throw

The number of circuit paths that can be controlled by one pole.

Agency Approvals



File E23301

Canadian approval through UL



File 16503 — Canada
 Canadian Standards Association



File E23301

(per UL 1054 for special use switches) — **USA**
 Underwriters Laboratories, Inc.



File No. on Request —
 VDE Verband Deutscher Elektrotechniker



Government Listings

Cage Code: 01963

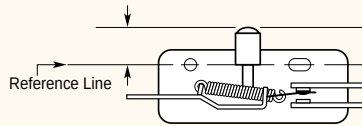
Federal ID: 36-2977756

Federal Business Code: 03680

Switch Terminology

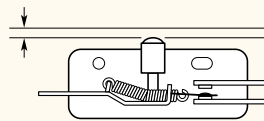
Rest Position

The position the switch button (or actuator) assumes when no force is exerted against it. Measured from the reference line to the top of the button or actuator. Frequently specified as a maximum.



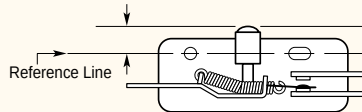
Pre-Travel

The distance of button (or actuator) travel from rest position to the point of operation. Pre-travel is frequently specified as a maximum.



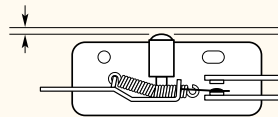
Operating Point

The position of the switch button (or actuator) at which initial switch contact transfer takes place. Measured from the reference line to the top of the button or actuator.



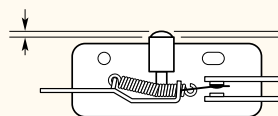
Over-Travel

The continued distance the switch button (or actuator) can travel after contact transfer, without damage to the switch mechanism. Over-travel is frequently specified as a minimum.



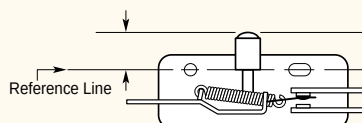
Movement Differential

The button (or actuator) movement required between operating point and the reset point. This is frequently dimensioned as a maximum.



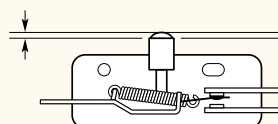
Reset Point

The point of actuation at which the second or return contact transfer takes place. At this point the contacts snap back to their original position. Measured from the reference line to the top of the button or actuator.



Reset Travel

The distance the switch button (or actuator) travels back from reset point to rest position.

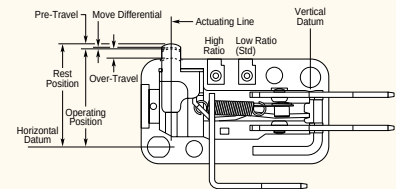


Switch Characteristics

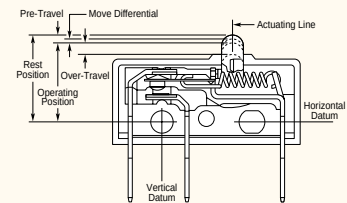
Dimensional Tolerances

All assembly dimensions shown carry the following tolerances unless otherwise specified: Decimals: ± 0.002 (2 place), ± 0.005 (3 place). Angles: $\pm 5^\circ$.

Miniature

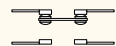


Subminiature



Circuitry

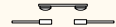
Single-Pole Double-Throw Double-Break



Single-Pole Single-Throw



Single-Pole Single-Throw Double-Break



Single-Pole Double-Throw



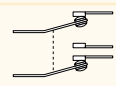
Double-Pole Single-Throw



Double-Pole Single-Throw Double-Make



Double-Pole Double-Throw



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