

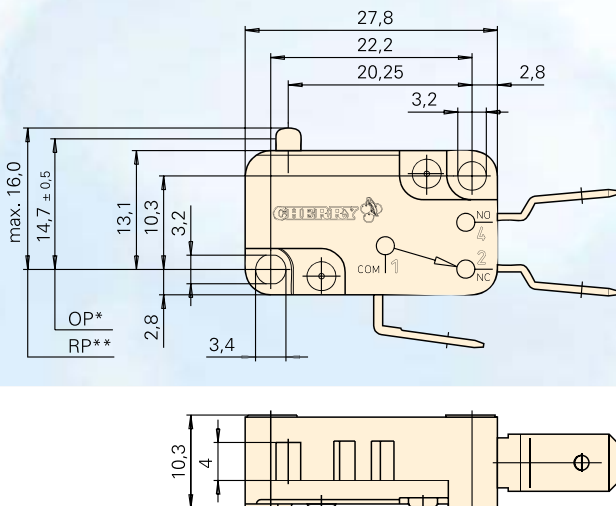
D3 miniature switch

Features




- Standard switch proven millions of times over, extremely frictional, self-cleaning contacts
- Version with contact gap > 3 mm on an identical basis
- Flexible thanks to various auxiliary actuators and various mounting points
- Wide variety of terminal types
- Approved according to EN 61058 and UL 1054

Dimensions in mm

S.P.D.T, S.P.S.T.-N.O., S.P.S.T.-N.C < 3 mm



Technical specifications

Contact configuration	S.P.D.T, S.P.S.T.-N.O., S.P.S.T.-N.C. (see table)
Contact gap	< 3 mm (μ) oder > 3 mm
Switching voltage	250 V AC and 400V AC (see table)
Switched current max.	10 A (> 3 mm) or 16A (< 3 mm, μ) (see table)
Operating force	max. 400 cN (< 3 mm, μ) max. 500 cN (> 3 mm)
Total travel	2,6 mm without auxiliary actuator
Mechanical life	> 1×10^6 operations (> 3 mm) > 20×10^6 operations (< 3 mm, μ)
Electrical life (max. load)	> 50,000 switching cycles acc. to EN 61058 > 10,000 sw. cycles acc. to UL 1054 (> 3 mm) > 6.000 sw. cycles acc. to UL 1054 (< 3 mm, μ)
Ambient temperature	40T85
Proof tracking index	PTI 250
Materials	
Housing/cover	PET (UL 94V-0)
Actuator	POM/PET
Contact material	AgCdO
Terminals	Cu/CuZn
Auxiliary actuator	nickel-plated steel, alternative stainless steel
Approvals	  
Degree of protection (switch interior)	IP40

*OP = Operating point

**RP = Rest point

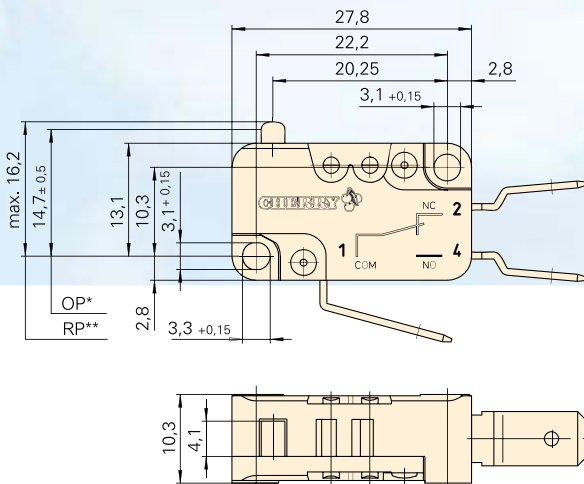
For detailed information and the layout of the details described above, please do not hesitate to ask for our technical specifications and drawing.

D4 miniature switch





Features

- Versatile snap switch with various auxiliary actuators and mounting points
- Fulfils requirements of IEC 60335-1: GWFI at 850 °C, GWIT at 775 °C and GWT 750 °C
- Reliable in operation, with high level of repeat accuracy
- High contact stability thanks to application-specific contact materials for switching currents of 0.1 to 21 A at 250 VAC
- Ambient temperature -40 to max. +150 °C
- EN 61058 and UL 1054-approved
- Cadmium-free contact material

Dimensions in mm



Technical specifications

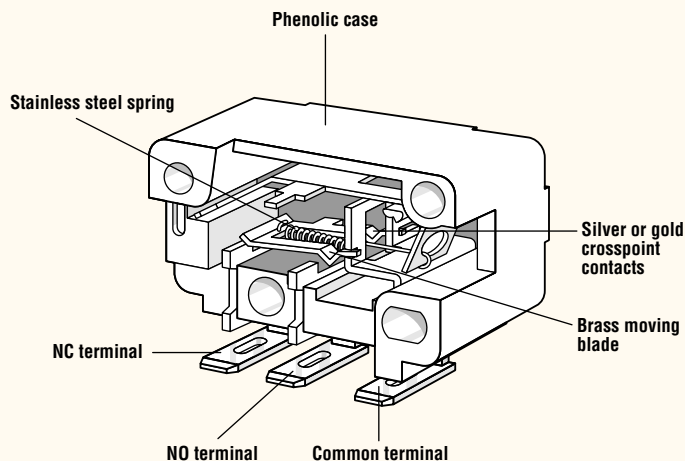
Contact configuration	S.P.D.T., S.P.S.T. - N.O., S.P.S.T. - N.C.
Contact gap	< 3 mm (μ)
Switching voltage	250 V AC (400 V on request)
Switched current max.	< 0,1 to 21 A, depending on model
Total travel	2,6 mm
Mechanical life	> 2 x 10 ⁵ to 1 x 10 ⁷ operations
Electrical life	see table
Ambient temperature	40T85; 40T125; 40T150
Proof tracking index	PTI 300
Materials	
Housing/Cover	PET (UL 94V-0)
Actuator	POM (max. 85 °C) PET alternative (UL 94 V-0)
Contact material D41	AuAgPt (Crosspoint)
D42	Ag
D43 - D48	AgNi
Terminals	CuZn alternative Cu
Auxiliary actuator	nickel-plated steel, alternative stainless steel
Approvals	   
Degree of protection (switch interior)	IP40

For detailed information and the layout of the details described above, please do not hesitate to ask for our technical specifications and drawing.

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



MINIATURE K Series

Features

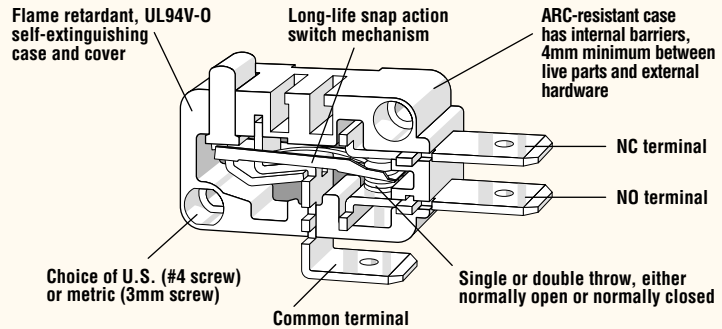
- Choice of current ratings up to 25 amps
- Choice of actuators
- Choice of terminals
- 3 contact arrangements
- Choice of operating force
- Long mechanical life
- Wiping contact action
- Snap over actuators
- Agency approved extended life versions

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

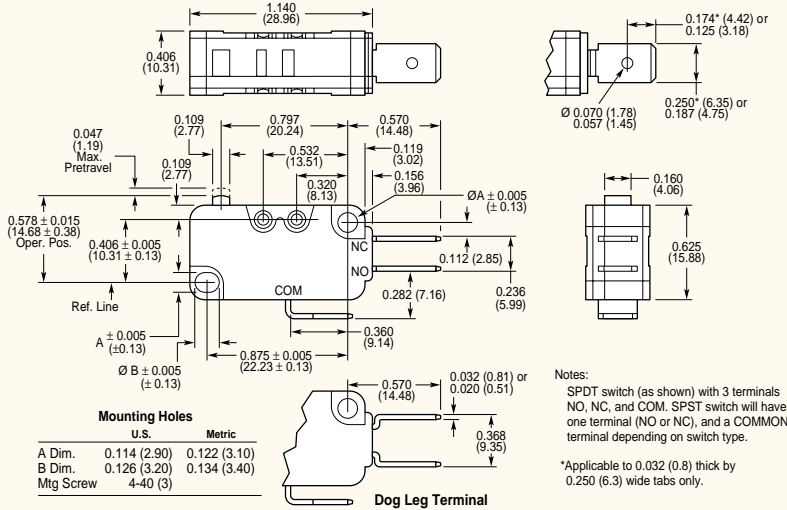
Materials

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)



	Mounting Holes	
	U.S.	Metric
A Dim.	0.114 (2.90)	0.122 (3.10)
B Dim.	0.126 (3.20)	0.134 (3.40)
Mtg Screw	4-40 (3)	

Dog Leg Terminal

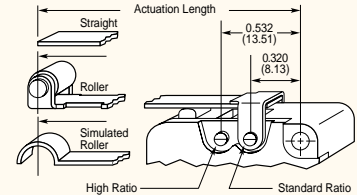
Notes:
SPDT switch (as shown) with 3 terminals NO, NC, and COM. SPST switch will have one terminal (NO or NC), and a COMMON terminal depending on switch type.

*Applicable to 0.032 (0.8) thick by 0.250 (6.3) wide tabs only.

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)

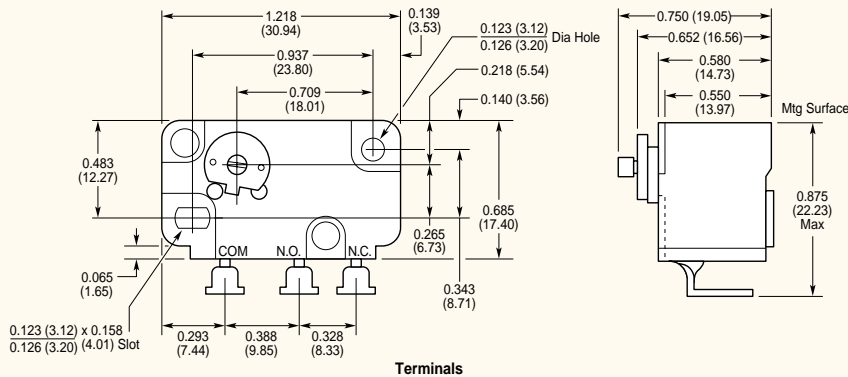
*Measured above reference line. Refer to dimensional drawing above. **Actuator tolerance ± 0.031 inches (0.79mm).

Ordering Information

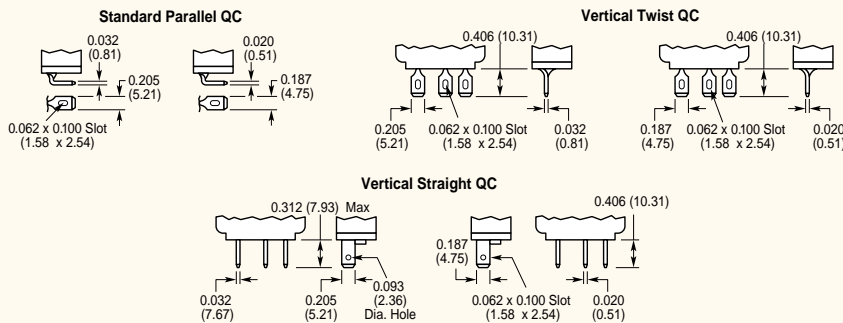
K Series/Prefix		A		D		Q		A C A				
Light	Standard	Current	Code	Force	Rating	Notes	Code	Terminal Type	inches (mm)	Code	Type	Actuation Length inches (mm)
A	25	B	75	50mA	1	1. μ ULis rated for 100,000 cycles at 85°C, 150°C, 200°C. VDE rated for 150°C only.	P4	0.062 x 0.032 (1.57 x 0.81)	PCB*	A	Button	—
C	25	D	75	1A	1	2. μ ULis rated for 100,000 cycles at 85°C, 150°C, 200°C. VDE rated for 85°C only.	Q	0.187 x 0.020 (4.75 x 0.51)	Straight	B	Straight SR	0.865 (21.97)
E	25	F	75	3A	1	3. μ ULis rated for 100,000 cycles at 85°C only.	R	0.187 x 0.020 (4.75 x 0.51)	Dog Leg	C	Straight SR	1.400 (35.56)
G	50	H	150	5A	1	4. Available in 10A and lower, μ ULis rated for 100,000 cycles at 85°C and 150°C.	S	0.187 x 0.032 (4.75 x 0.81)	Straight	D	Straight SR	2.722 (69.14)
J	75	K	150	10A	1	5. Available with 0.250 x 0.032" terminals only.	T	0.187 x 0.032 (4.75 x 0.81)	Dog Leg	E	Straight HR	1.077 (27.36)
		L	150	15A	3		V	0.250 x 0.032 (6.35 x 0.81)	Straight	F	Straight HR	1.612 (40.95)
		M	150	15A	2		W	0.250 x 0.032 (6.35 x 0.81)	Dog Leg	G	Straight HR	2.934 (74.52)
		S	225	25A	3, 5					J	SIM Roller SR	1.254 (31.85)
										M	SIM Roller HR	1.466 (37.24)
										Y†	Roller SR	0.810 (20.57)
										Q	Roller SR	1.340 (34.04)
										W†	Roller HR	1.022 (25.96)
										T	Roller HR	1.552 (39.42)



Dimensions inches (mm)

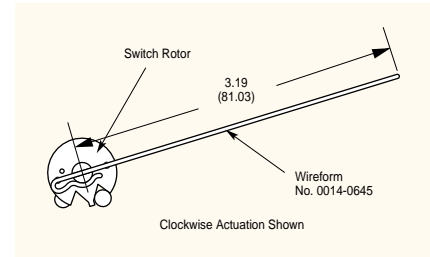


Terminals



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

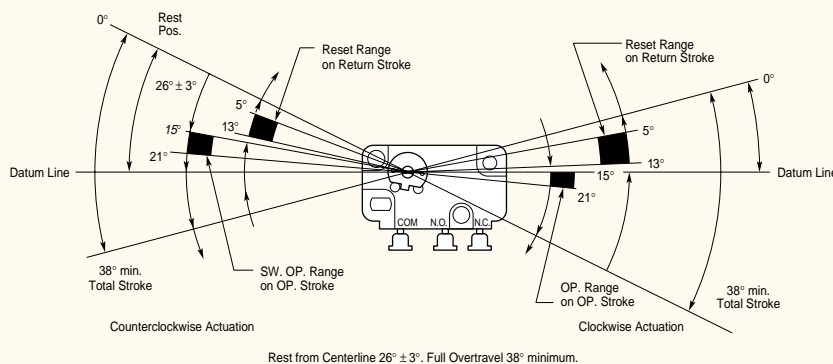
Recommended mounting screw size: #4-40 Round head. Recommended torque on screw: 4 inch lbs. max.

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.



Actuator Specifications

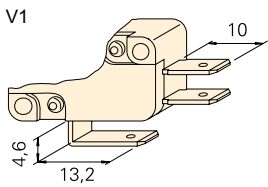
Switch Type	Actuator Type	Direction of Actuator	Terminals inches (mm)
	-00B	Clockwise	Standard Parallel 0.205 (5.21)
	-00R	Clockwise	Standard Parallel 0.187 (4.75)
	-00E	Counter Clockwise	Standard Parallel 0.205 (5.21)
	-00T	Counter Clockwise	Standard Parallel 0.187 (4.75)
	-50B	Clockwise	Vertical Twist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

Ordering Information

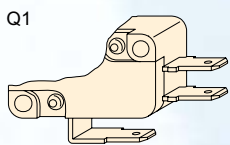
Select the current rating you need. Combine the corresponding Series/Prefix number with the appropriate suffix number for the switch type, circuitry and terminals you require.

Terminals

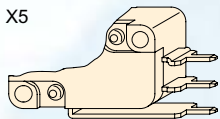
Q.C. terminal 6.3 x 0.8 straight



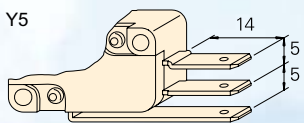
Q.C. terminal 4.8 x 0.8 straight



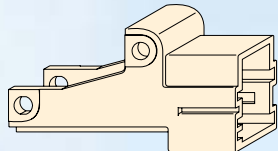
Q.C. terminal RAST 2.5



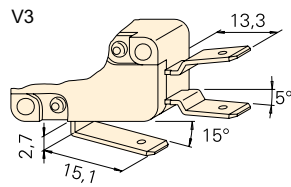
Q.C. terminal 6.3 x 0.8 RAST 5



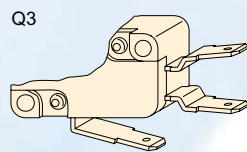
Connector housing for Q.C. terminals 6.3 x 0.8, RAST 5



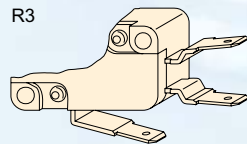
Q.C. terminal 6.3 x 0.8 dog-leg



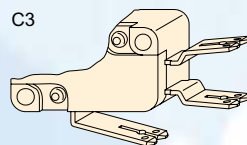
Q.C. terminal 4.8 x 0.8 dog-leg



Q.C. terminal 4.8 x 0.5 dog-leg

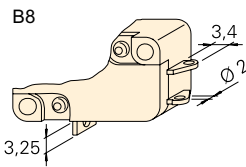


Q.C. terminal 2.8 x 0.8 bifurcated dog-leg

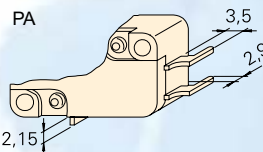


Other terminals available on request.

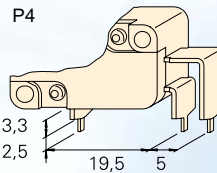
Solder terminal, short



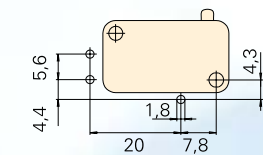
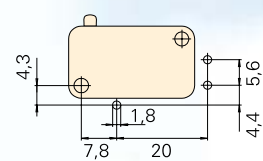
PCB terminal 1.3 x 0.8 housing side



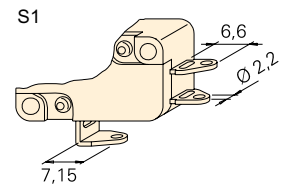
PCB terminal 1.3 x 0.5 underside



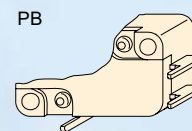
Drilling patterns for PCB terminals



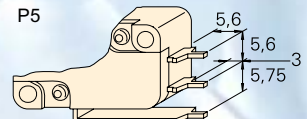
Solder terminal with temperature-stop



PCB terminal 1.3 x 0.8 cover side



PCB terminal 1.3 x 0.8 rear

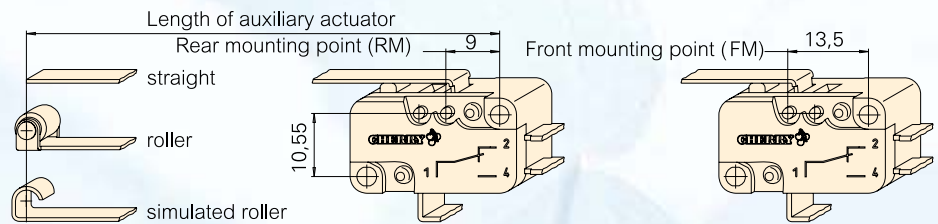


Electrical rating and operating life (2)

Electrical rating according to EN 61058		Electrical life for 40T85* acc. to EN acc. to UL (operations)		Mechanical life actuator material POM PET		Max. operating force (cN)	Code
UL 1054							
Standard operating force							
0,1 (0,05) A, 250 V AC	0,1 A 125–250 V AC	50.000	6.000	10 x 10 ⁶	1 x 10 ⁶	170**	1
3 (1) A, 250 V AC	3 A, 125–250 V AC 1/10 HP 250 V AC	50.000	6.000	10 x 10 ⁶	1 x 10 ⁶	170**	2
6 (2) A, 250 V AC	5 A, 125–250 V AC, 1/4 HP 250 V AC	50.000	6.000	5 x 10 ⁶	25 x 10 ⁴	170	3
10 (3) A, 250 V AC	10 A, 1/2 HP, 125–250 V AC	50.000	6.000	1 x 10 ⁶	1 x 10 ⁵	285	4
16 (4) A, 250 V AC	15 A, 1/2 HP, 125–250 V AC	50.000	6.000	2 x 10 ⁵	1 x 10 ⁵	400	5
10 (3) A, 400 V AC							
Light operating force							
0,1 (0,05) A, 250 V AC	0,1 A, 125–250 V AC	50.000	6.000	10 x 10 ⁶	1 x 10 ⁶	45**	1
3 (1) A, 250 V AC	3 A, 125–250 V AC, 1/10 HP 250 V AC	50.000	6.000	10 x 10 ⁶	1 x 10 ⁶	45**	2
6 (2) A, 250 V AC	5 A, 125–250 V AC, 1/4 HP 250 V AC	50.000	6.000	10 x 10 ⁶	5 x 10 ⁵	45	3
10 (3) A, 250 V AC	10 A, 1/2 HP, 125–250 V AC	50.000	6.000	10 x 10 ⁶	25 x 10 ⁴	75	4
16 (4) A, 250 V AC	15 A, 1/2 HP, 125–250 V AC	50.000	6.000	10 x 10 ⁶	25 x 10 ⁴	100	5
21 (8) A, 250 V AC	21 A, 250 V AC 1HP 125 V AC 2HP 250 V AC	10.000	6.000	3 x 10 ⁶	25 x 10 ⁴	150	8

* Operating life for 40T125 and 40T150 on request

** Lower operating forces on request



Switching parameters

Model	Type	Max. operating force (cN)		Max. pretravel (mm)	Min. overtravel (mm)	Max. movement differential (mm)	Max. rest position (mm)	Operating point (mm)	Code
		Standard	Light						
Without auxiliary actuator	D41	170	45	1,2	1,3	0,3	16,2	14,7 ± 0,5	AA
	D42	170	45	1,2	1,3	0,3	16,2	14,7 ± 0,5	
	D43	170	45	1,2	1,3	0,3	16,2	14,7 ± 0,5	
	D44	285	75	1,2	1,3	0,3	16,2	14,7 ± 0,5	
	D45	400	100	1,2	1,3	0,3	16,2	14,7 ± 0,5	
	D48	–	150	150	1,6	1,2	0,3	16,2	

Contact configuration (3)

Contact configuration	
Ambient temperature 40T120	Code
Standard operating force	
S.P.S.T.-N.O.	1
S.P.S.T. - N.C.	2
S.P.D.T.	3
Light operating force	
Code	
S.P.S.T.-N.O.	7
S.P.S.T. - N.C.	8
S.P.D.T.	9
Contact configuration	
Ambient temperature 40T125	Code
Standard operating force	
S.P.S.T.-N.O.	G
S.P.S.T. - N.C.	H
S.P.D.T.	M
Light operating force	
Code	
S.P.S.T.-N.O.	N
S.P.S.T. - N.C.	P
S.P.D.T.	R
Contact configuration	
Ambient temperature 40T150*	Code
Light operating force	
Code	
S.P.S.T.-N.O.	S
S.P.S.T. - N.C.	T
S.P.D.T.	U

* not for D48

Terminals (4)

Type of terminal	Code
Q.C. terminal 6.3 x 0.8 mm, straight	V1
Q.C. terminal 6.3 x 0.8 mm, dog-leg	V3
Q.C. terminal 6.3 x 0.8 mm, RAST 5	Y5
Q.C. terminal, RAST 2,5	X5
Q.C. terminal 4.8 x 0.8 mm, straight*	Q1
Q.C. terminal 4.8 x 0.8 mm, dog-leg*	Q3
Q.C. terminal 4.8 x 0.5 mm, dog-leg**	R3
Q.C. terminal 2.8 x 0.8 mm, bifurcated, dog-leg	C3
Solder terminal, short*	B8
Solder terminal with temperature-stop	S1
Welding terminal	A1
PCB terminal 1.3 x 0.8 mm housing side*	PA
PCB terminal 1.3 x 0.8 mm cover side*	PB
PCB terminal 1.3 x 0.5 mm underside*	P4
PCB terminal 1.3 x 0.8 mm rear*	P5

* not for D48 ** not for D45 and D48

Auxiliary actuator options (5)

Model	Mounting point	Length	Code	Code
Without auxiliary actuator			AA	
Material			Nickel-plated steel	Optional stainless steel
Straight	RM rear	21,2	LA	JA
		35,6	LD	JD
		69,9	LL	JL
	FM front	25,7	MA	KA
		40,1	MD	KD
		74,4	ML	KL
Roller	RM rear	20,6	RA	
		34,1	RD	
	FM front	25,1	TA	
		38,6	TD	
Simulated roller	RM rear	20,6	SA	
	FM front	25,1	UA	

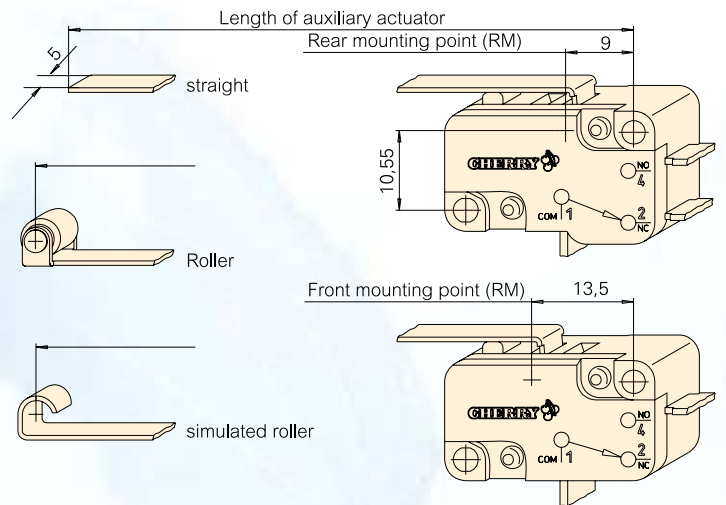
Contact configuration (3)

Contact configuration	Contact gap	Code
S.P.S.T. - N.O.	< 3 mm μ	1
S.P.S.T. - N.C.	< 3 mm μ	2
S.P.D.T	< 3 mm μ	3
S.P.S.T. - N.O.	> 3 mm	4
S.P.S.T. - N.C.	> 3 mm	5
S.P.D.T	> 3 mm	6

Terminals (4)

Type of terminal	Code
Q.C. terminal 6.8 x 0.8 mm, straight	V1
Q.C. terminal 6.8 x 0.8 mm, dog-leg	V3
Q.C. terminal 4.8 x 0.8 mm, straight	Q1
Q.C. terminal 4.8 x 0.8 mm, dog-leg	Q3
Solder terminal with temperature-stop	S8
Screw terminal (only D38 and D3B)	W9
Q.C. terminal 2/2.8 x 0.8 mm, welding terminal, solder terminal and other terminal configurations on request.	

Auxiliary actuator



Auxiliary actuator options (5)

Model	Mounting point	Length	Code	Code
Without auxiliary actuator			AA	
Material			Nickel-plated steel	Optional stainless steel
Straight	RM rear	21,2	LA	JA
		35,6	LD	JD
		69,9	LL	JL
	FM front	25,7	MA	KA
		40,1	MD	KD
		74,4	ML	KL
Roller	RM rear	20,6	RA	
		34,1	RD	
	FM front	25,1	TA	
		38,6	TD	
Simulated roller	RM rear	20,6	SA	
	FM front	25,1	UA	

Switching parameters

Model		Max. operating force (cN)	Max. pretravel (mm)	Min. overtravel (mm)	Max. movement differential (mm)	Max. rest position (mm)	Operating point (mm)
Without auxiliary actuator	> 3 mm	500	1,9	0,7	1,2	16,0	14,4 ± 0,5
Without auxiliary actuator	< 3 mm	400	1,5	1,2	0,3	16,0	14,7 ± 0,5