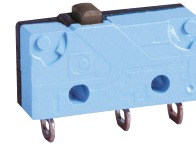


# SUBMINIATURE MICROSWITCHES - PREMIUM

## V4 - 83170

- › High precision flexible leaf snap-action mechanism
- › Operation without balance-point, even at extremely slow actuating speed
- › Ratings from 1 mA 4 V<sub>DC</sub> up to 12(6) A 250 V<sub>AC</sub> and 1/4 hp 125-250 V<sub>AC</sub>
- › ENEC and cURus approved up to +150 °C
- › Housing material complying with IEC 60335-1 for unattended appliances:  
GWFI 850° C / GWIT 775° C
- › Mechanical life up to 30 million cycles
- › High resistance to shock and vibration
- › Choice of connections with symmetric and asymmetric pinning
- › Wide choice of actuators on 2 possible fixing positions  
(pre-assembled or retrofittable)



### Main specifications

			Standard 831700	Low force 831704	Dual-current 831708	Dual-current Low force 831709
Function	Connections	Actuators				
I (changeover)	W2 (solder)	No	83170002	83170402	83170802	83170902
I (changeover)	W7A5 (QC 2.8x0.5)	No	83170005	83170405	83170805	83170905
I (changeover)	X1 (PCB, straight)	No	83170008	83170408	83170808	83170908
I (changeover)	X1S (PCB, straight, sym)	No	83170009	83170409	83170809	83170909
I (changeover)	X2 (PCB, rear)	No	83170010	83170410	83170810	83170910
I (changeover)	X2S (PCB, rear, sym)	No	83170011	83170411	83170811	83170911
I (changeover)	X3 (PCB, front)	No	83170012	83170412	83170812	83170912
I (changeover)	X3S (PCB, front, sym)	No	83170013	83170413	83170813	83170913
R (normally closed)	W2 (solder)	No	83170003	83170403	83170803	83170903
R (normally closed)	W7A5 (QC 2.8x0.5)	No	83170006	83170406	83170806	83170906
C (normally open)	W2 (solder)	No	83170004	83170404	83170804	83170904
C (normally open)	W7A5 (QC 2.8x0.5)	No	83170007	83170407	83170807	83170907
Configurations with actuators		Yes	See page 5	See page 5	See page 5	See page 5
Electrical characteristics						
Rating nominal / 250 V AC (A)			10	5	5**	5**
Rating thermal / 250 V AC (A)			12.5	6	6	6
Rating ENEC/UL/ 250 V AC (A)			10(2) - 3(3) - 10 GP	5(1) - 5 GP	5(1) - 1 GP	5(1) - 1 GP
Mechanical characteristics						
Maximum operating force (N)			1.5	0.6	1.5	0.6
Min. Release force (N)			0.3	0.1	0.3	0.1
Maximum total travel force (N)			1.8	1	1.8	1
Max. allowable overtravel force (N)			10	10	10	10
Rest position max. (mm)			9.2	9.2	9.2	9.2
Operating position (mm)			8.4±0.3	8.4±0.3	8.4±0.3	8.4±0.3
Maximum differential travel (mm)			0.15	0.15	0.15	0.15
Min. overtravel (mm)			0.5	0.5	0.5	0.5
Ambient operating temperature (°C)			-40 → +125	-40 → +125	-40 → +125	-40 → +125
Mechanical life (operations)			10 <sup>7</sup>	3.10 <sup>7</sup>	10 <sup>7</sup>	3.10 <sup>7</sup>
Contact gap (mm)			0.35	0.35	0.35	0.35
Weight (g)			1.7	1.7	1.7	1.7

### Additional specifications

- Case: PA66 GF (UL 94-V0 / GWFI 960 °C / GWIT 775 °C)
- Button: PA66 GF
- Moving blade: beryllium copper
- Contacts: silver alloy, micro-profile  
gold alloy on silver alloy, crossbar (dual-current)
- Terminals: copper nickel (except W7A5: brass)
- Levers: stainless steel or plastic, polyamide roller
- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 400
- Protection against electric shock: button and actuators have reinforced insulation for U<sub>i</sub> 250 V / U<sub>imp</sub> 2,5kV / pollution 2
- Recommended min actuating speed: 0.001 mm/s
- Conformity / Certifications:

### Product adaptations



- › Special actuators: stainless steel or plastic, special shapes and lengths, stainless steel roller, ...
- › Special connections: angled, screw, double tabs, ...
- › Special fastening pins
- › High operating temperature: +150 °C
- › 12(6) A 250 Vac ENEC and cURus approved version (831700 SP9765)
- › AgSnO2 contacts for very high inrush currents (lamp and capacitor loads)
- › Increased or reduced differential travel (SP4982: max 0.08 mm)
- › Specific operating force up to 2.2 N
- › Telescopic plunger with 3 mm overtravel and adjustable fixing by threaded barrel
- › NC contacts with forced break action to prevent contact welding in case of accidental overcurrents

Standard product

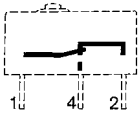
Product made to order



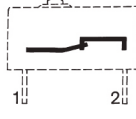
Contact us

## Principles

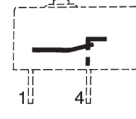
Single break snap-action switch  
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)

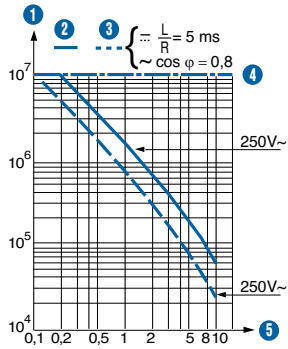


Normally open - SPST-NO (form A)



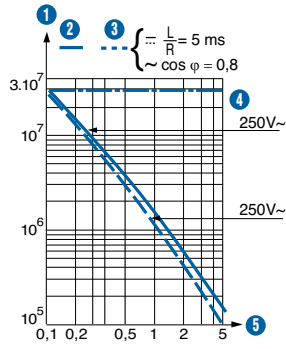
## Curves

Operating curve for type 831700



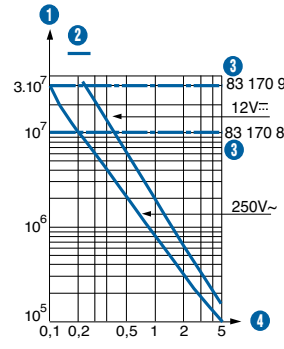
- 1 Number of cycles
- 2 Resistive circuit
- 3 Inductive circuit
- 4 Mechanical life limit
- 5 Current in Amps

Operating curve for type 831704



- 1 Number of cycles
- 2 Resistive circuit
- 3 Inductive circuit
- 4 Mechanical life limit
- 5 Current in Amps

Operating curve for types 831708/831709



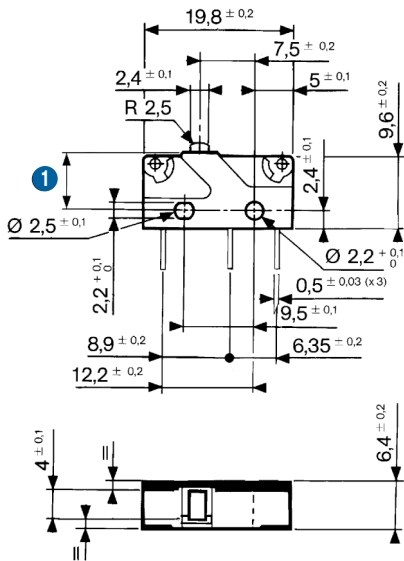
- 1 Number of cycles
- 2 Resistive circuit
- 3 Mechanical life limit
- 4 Current in Amps

\*\* Models 831708 and 831709 are designed to operate equally well on low-current (1 mA 4 V minimum recommended) or medium-current (5 A maximum) circuits. However, a given product should only be used to switch one type of circuit during its working life.

## Dimensions

### Products

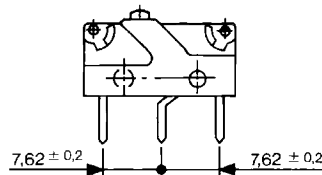
83170  
Asymmetrical version



1 Total travel position = max 7.6

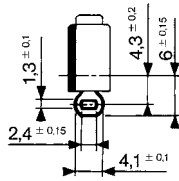
Fixing with M2 screws  
Recommended tightening torque: 0.2 N.m

83170  
Symmetrical version (X.S connections)

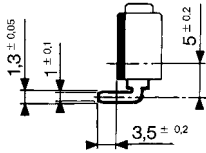


## Connections

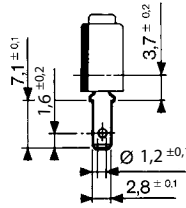
### W2 solder



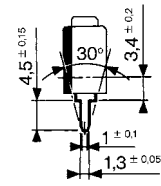
### X2 - X2S for PCB, rear output



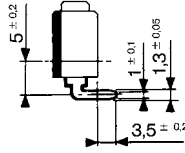
### W7A5 quick-connect 2.8 x 0.5



### X1 - X1S for PCB, straight output

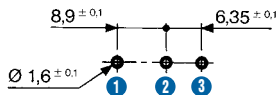


### X3 - X3S for PCB, front output



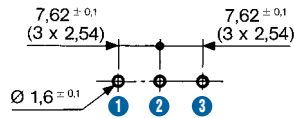
## Drilling

### Printed circuit board mounting Asymmetrical X1 - X2 - X3



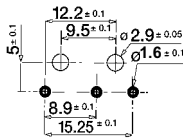
- 1 1.C
- 2 4.NO
- 3 2.NC

### Printed circuit board mounting Symmetrical X1S - X2S - X3S

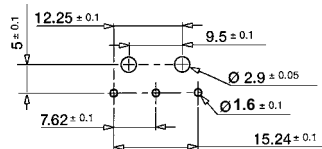


- 1 1.C
- 2 4.NO
- 3 2.NC

### Mounting on a printed circuit board with holding pins Asymmetrical X2 - X3

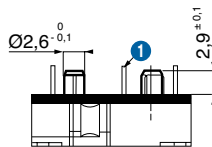


### Mounting on a printed circuit board with holding pins Symmetrical X2S - X3S



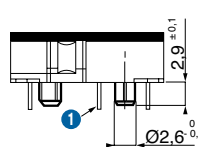
## Mounting accessories

### Locating pins 79219682



- 1 X2 - X2S connections

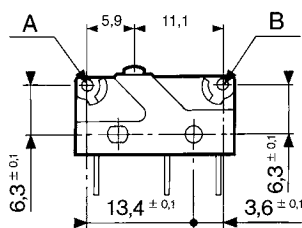
### Locating pins 79219682



- 1 X3 - X3S connections

Other shapes and dimensions:  
consult us

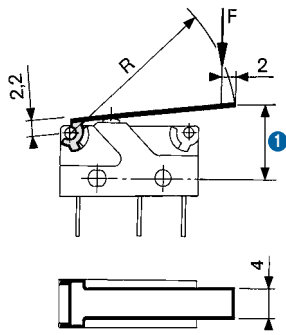
## Actuator mounting positions



To calculate force : divide the switch force by the coefficient in the table.  
To calculate travel : multiply the switch travel by the same coefficient.

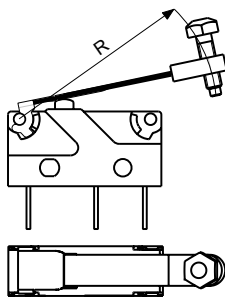
## Actuators

170A flat

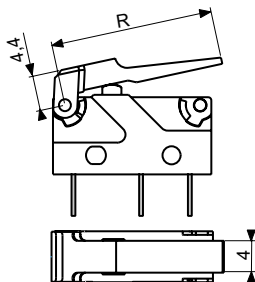


1 Operating position

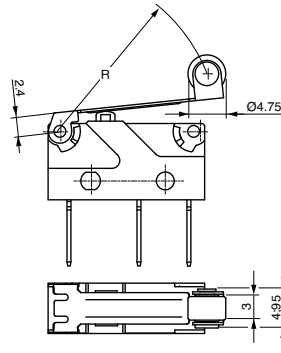
170D adjustable



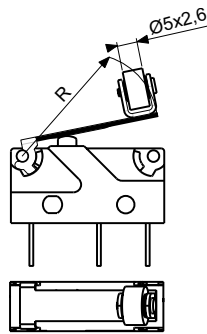
79257876 plastic



170E roller

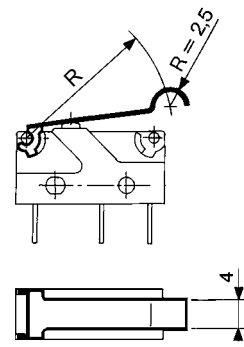


170EL transverse roller

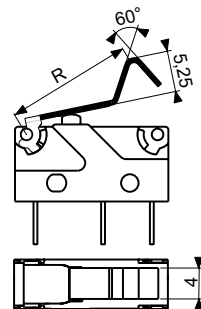


Other shapes and dimensions:  
consult us

170F dummy roller



79250004 folded



## Actuators and mounting accessories

Part numbers for standard actuators	79253327	79253326	79253328	79552663	79253329
Actuators	Flat 170A R18,3	Flat 170A R24	Flat 170A R41	Roller 170E R20	Dummy roller 170F R19,5
Fixing positions	A B	A B	A B	A B	A B
Coefficient	3 1.5	4 2	7 3.5	3 1.5	3 1.5
Operating position (mm)	10 ±1 9.4 ±0.6	10.8 ±1.4 9.8 ±0.8	12.1 ±2.6 10.5 ±1.5	14.7 ±1.3 14.2 ±0.8	12.6 ±1.2 11.9 ±0.7
Part numbers for standard actuators	79218491	79218493	79250004	79257876	
Actuators	Adjustable 170D R26,5	Transverse roller 170EL R18	Folded R16,5	Plastic (PARA GF50) R20,5	
Fixing positions	A B	A B	A B	A B	
Coefficient	4 2	3 1.5	2.5 1.2	3 -	
Operating position (mm)	13.6-18.6 ±1.8 12.5-17.5 ±1.1	16.3 ±1.2 15.6 ±0.8	15 ±1 13.9 ±0.6	10.6 ±1.1 -	

Except where otherwise indicated, levers are supplied unmounted. For factory mounting, specify fixing position A or B.

**V4 - 83170 microswitches with referenced actuators**

Actuators	170A R18.3 79253327		170A R24 79253326		170E R20 79218454		170F R19.5 79253329		Folded R16,5 79250004		Plastic 79257876
	Pos A	Pos B	Pos A	Pos B	Pos A	Pos B	Pos A	Pos B	Pos A	Pos B	Pos A
<b>831700</b> I W2 I W7A5 I X1 I X1S I X2 I X3	83170162	83170185	83170182	•	•	•	•	•	83170028	83170032	83170176
	83170197	83170037	•	•	•	•	•	83170046	83170183	•	•
	•	•	•	•	83170121	83170049	83171014	83170184	•	•	•
	•	83170160	•	•	•	•	•	•	•	•	•
	•	83170161	•	•	•	•	83170038	•	83170035	•	•
	•	•	•	•	•	83170039	•	•	83170036	•	•
<b>831704</b> I W2 I W7A5 I X1 I X1S I X2 I X3	83170437	83170439	83170440	83170441	83170434	83170442	83170443	83170444	•	•	•
	83170445	83170446	83170447	83170448	83170449	83170450	83170451	83170433	•	•	•
	83170464	83170465	83170466	83170467	83170468	83170469	83170470	83170471	•	•	•
	•	•	•	•	83170435	•	•	•	•	•	•
	•	•	•	•	•	•	•	•	83170427	•	•
	•	•	•	•	•	•	•	•	83170428	•	•
	•	•	•	•	•	•	•	•	•	•	•
<b>831708</b> I W2 I W7A5 I X1 I X1S I X2 I X3	83170848	•	83170832	•	83170865	•	•	•	83170833	•	83170864
	•	83170849	83170869	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	83170850	83170851	•	•	•
	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	•	•	•	•	•
<b>831709</b> I W2 I W7A5 I X1 I X1S I X2 I X3	83170930	83170931	83170932	83170933	83170934	83170935	83170936	83170937	•	•	•
	83170938	83170939	83170929	83170940	83170941	83170942	83170943	83170944	•	•	•
	83170928	83170945	83170946	83170947	83170948	83170949	83170950	83170951	•	•	•
	83170926	83170927	•	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	•	•	•	•	•

**Installation recommendations**

See "Basic technical concepts"

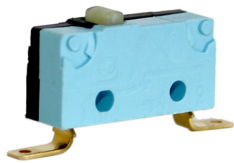
**How to order**

Use the 8 digit part numbers when they are defined

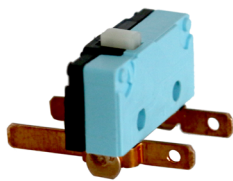
Other cases, precise: Type of microswitch - Function - Connection - Actuator\* - Fixing position\* - Mounting accessories\* - Adaptation\*  
\* if needed

Example: 831708 I X2 170A R24 B 79219682

**Examples of special adaptations**



Angled W7A5 terminals



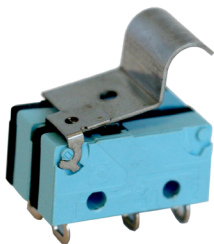
Double lateral 2.8 x 0.5 quick-connect terminals



Top mounted bracket and screw terminals



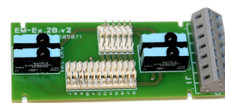
Telescopic plunger with 3 mm overtravel and with M6 x 0.75 threaded barrel



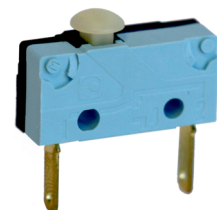
Two-pole assembly with single actuator



Fastening pins for 2.8 max thickness and Ø 4mm holes (79253576)



PCB assembly with terminal block



Special buttons: see "V4 Mushroom-head button - 83170 BC"

Standard product

Product made to order

● Contact us

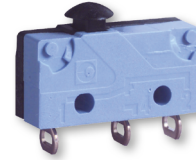
**Warning:**

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# SUBMINIATURE MICROSWITCHES - PREMIUM

## V4 Mushroom-head button - 83170 BC

- › High precision flexible leaf snap-action mechanism
- › Suitable for lateral approach from any direction with angle up to 45°
- › Operation without balance-point, even at extremely slow actuating speed
- › Ratings from 1 mA 4 V<sub>DC</sub> up to 12(6) A 250 V<sub>AC</sub> and 1/4 hp 125-250 V<sub>AC</sub>
- › ENEC and cURus approved up to +150 °C
- › Housing material complying with IEC 60335-1 for unattended appliances: GWFI 850° C / GWIT 775° C
- › Mechanical life 1 million cycles
- › High resistance to shock and vibration
- › Choice of connections with symmetric and asymmetric pinning



### Main specifications

		Standard 831700 BC	Low force 831704 BC	Dual-current 831708 BC	Dual-current Low force 831709 BC
<b>Function</b>	<b>Connections</b>				
I (changeover)	W2 (solder)	83170107	83170473	●	83170965
I (changeover)	W7A5 (QC 2.8x0.5)	●	83170474	●	83170964
I (changeover)	X1 (PCB, straight)	83171006	●	83170840	83170971
I (changeover)	X1S (PCB, straight, sym)	●	83170481	●	●
I (changeover)	X2 (PCB, rear)	●	●	83170836	83170919
I (changeover)	X2S (PCB, rear, sym)	●	83170438	●	●
I (changeover)	X3 (PCB, front)	●	●	●	●
I (changeover)	X3S (PCB, front, sym)	●	83170486	83170874	●
R (normally closed)	W2 (solder)	●	83170495	●	●
R (normally closed)	W7A5 (QC 2.8x0.5)	●	●	●	●
C (normally open)	W2 (solder)	●	●	●	●
C (normally open)	W7A5 (QC 2.8x0.5)	83170114	83170475	●	●
<b>Electrical characteristics</b>					
Rating nominal / 250 V AC (A)		10	5	5**	5**
Rating thermal / 250 V AC (A)		12.5	6	6	6
Rating ENEC/UL/ 250 V AC (A)		10(2) - 3(3) - 10 GP	5(1) - 5 GP	5(1) - 1 GP	5(1) - 1 GP
<b>Mechanical characteristics</b>					
Maximum operating force (N)		1.5	0.6	1.5	0.6
Min. Release force (N)		0.3	0.1	0.3	0.1
Maximum total travel force (N)		1.8	1	1.8	1
Max. allowable overtravel force (N)		10	10	10	10
Rest position max. (mm)		10.8	10.8	10.8	10.8
Operating position (mm)		9.9±0.3	9.9±0.3	9.9±0.3	9.9±0.3
Maximum differential travel (mm)		0.15	0.15	0.15	0.15
Min. overtravel (mm)		0.5	0.5	0.5	0.5
Ambient operating temperature (°C)		-40 +125	-40 +125	-40 +125	-40 +125
Mechanical life at 45° (operations)		10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>
Contact gap (mm)		0.35	0.35	0.35	0.35
Weight (g)		1.7	1.7	1.7	1.7

### Additional specifications

- Case: PA66 GF (UL 94-V0 / GWFI 960 °C / GWIT 775 °C)
- Button: PA66 GF
- Moving blade: beryllium copper
- Contacts: silver alloy, micro-profile  
gold alloy on silver alloy, crossbar (dual-current)
- Terminals: copper nickel (except W7A5: brass)

- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 400
- Protection against electric shock: button has reinforced insulation for U<sub>i</sub> 250V / U<sub>imp</sub> 2,5kV / pollution 2
- Recommended min actuating speed: 0.001 mm/s
- Conformity / Certifications: cULus CE ENEC CE

### Product adaptations



- › Special buttons: cylindrical radius, specific width and height
- › Special connections: angled, screw, double tabs ...
- › Special fastening pins
- › High operating temperature: +150 °C
- › 12 A 250 V<sub>AC</sub> version
- › AgSnO<sub>2</sub> contacts for very high inrush currents (lamp and capacitor loads)
- › Increased or reduced differential travel (eg: max. 0.08 mm)
- › Specific operating force up to 2.2 N

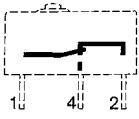
Standard product

Product made to order

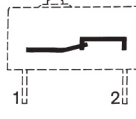
● Contact us

## Principles

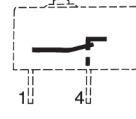
Single break snap-action switch  
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)

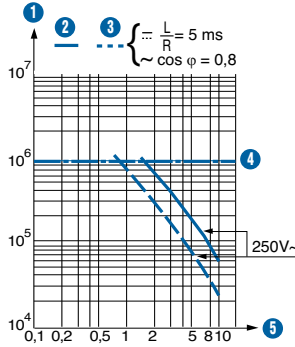


Normally open - SPST-NO (form A)



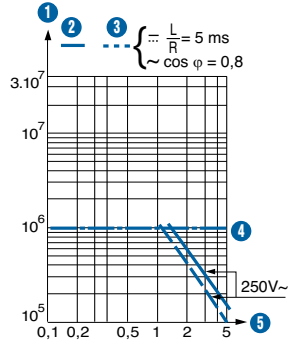
## Curves

Operating curve for type  
831700 BC



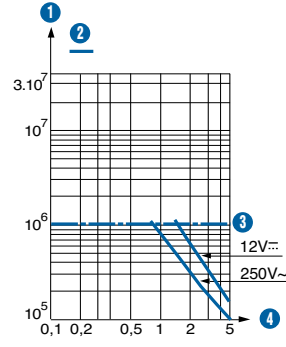
- 1 Number of cycles
- 2 Resistive circuit
- 3 Inductive circuit
- 4 Mechanical life limit
- 5 Current in Amps

Operating curve for type  
831704 BC



- 1 Number of cycles
- 2 Resistive circuit
- 3 Inductive circuit
- 4 Mechanical life limit
- 5 Current in Amps

Operating curve for types  
831708 BC/831709 BC



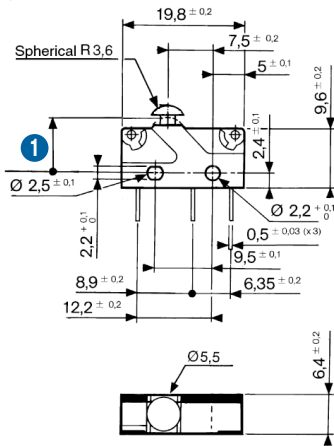
- 1 Number of cycles
- 2 Resistive circuit
- 3 Mechanical life limit
- 4 Current in Amps

\*\*Models 831708 BC and 831709 BC are designed to operate equally well on low-current (1 mA 4 V minimum recommended) or medium-current (5 A maximum) circuits. However, a given product should only be used to switch one type of circuit during its working life.

## Dimensions

### Products

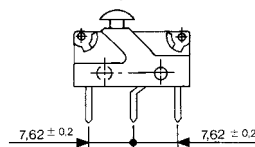
83170 BC  
Asymmetrical version



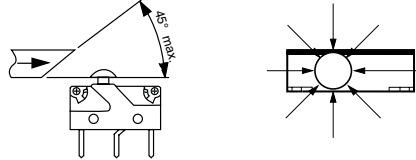
1 Total travel position: max 9.1

Fixing with M2 screws  
Recommended tightening torque: 0.2 N.m

83170 BC  
Symmetrical version (X.S connections)



Recommendations for lateral approach

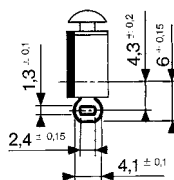


In order to reduce friction and wear, the actuating ramp shall preferably be of POM, PA, PBT or steel, and also be as smooth as possible.

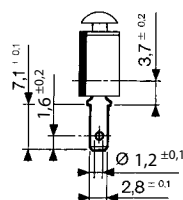
As a general rule, the use of any lubricant substance is not needed nor recommended. For particular cases, please consult us.

## Connections

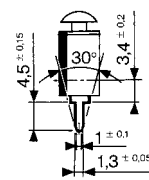
W2 solder



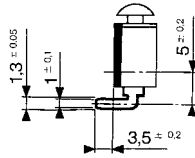
W7A5 quick-connect 2.8 x 0.5



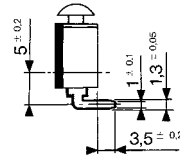
X1 - X1S for PCB, straight output



**X2 - X2S for PCB, rear output**

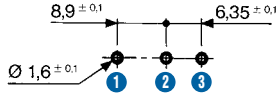


**X3 - X3S for PCB, front output**



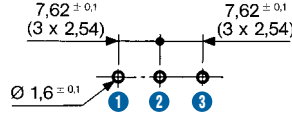
**Drilling**

**Printed circuit board mounting  
Asymmetrical X1 - X2 - X3**



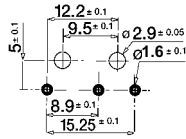
- 1 1.C
- 2 4.NO
- 3 2.NC

**Printed circuit board mounting  
Symmetrical X1S - X2S - X3S**

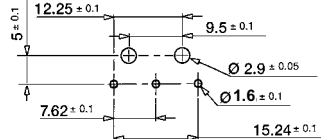


- 1 1.C
- 2 4.NO
- 3 2.NC

**Mounting on a printed circuit board  
with holding pins  
Asymmetrical X2 - X3**

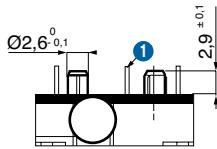


**Mounting on a printed circuit board  
with holding pins  
Symmetrical X2S - X3S**



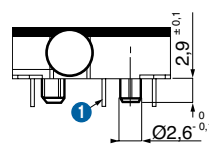
**Mounting accessories**

**Locating pins 79219682**



- 1 X2 - X2S connections

**Locating pins 79219682**



- 1 X3 - X3S connections

**Installation recommendations**

See "Basic technical concepts"

**How to order**

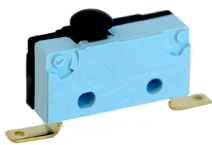
Use the 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch - Function - Connection - Mounting accessories\* - Adaptation\*

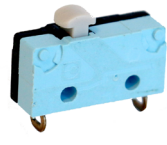
\* if needed

Example: 831700 BC | X3 79219682

**Examples of special adaptations**



Angled W7A5 terminals



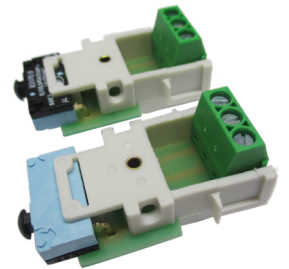
Button head with cylindrical radius - 4 mm width



Button head with cylindrical radius - 5.5 mm width



Fastening pins for 2.8 max thickness and Ø 4mm holes (79253576)



PCB assembly with terminal block

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