

# MINIATURE MICROSWITCHES - HEAVY DUTY

## 83160

- › Coil spring snap-action mechanism with wiping contacts
- › Ratings up to 16(4) A 250 V~ and 10(4) A 400 V~
- › Version with magnetic blowout for enhanced DC breaking capacity up to 5 A 250 V---
- › Long service life: 200 000 operations at nominal rating and up to 10 millions on light load
- › Contact gap less or greater than 3 mm (micro-disconnection ( $\mu$ ) or full disconnection)
- › Operating temperature -40 °C up to +150 °C
- › cURus and ENEC approved (except 831606 SP3697)
- › Wide choice of actuators: pinned or flexible, stainless steel or plastic



### Main specifications

		Standard 831600	Reduced force 831603	Low force 831604	Wide contact gap 831606	High DC rating 831606 SP3697
Function	Connections					
I (changeover)	W2 (solder)	83160005	83160320	83160420	83160602	83160664
I (changeover)	W3 (QC 6.3x0.8)	83160006	83160301	83160401	83160601	83160679
I (changeover)	W6 (QC 4.8x0.5)	83160045	83160321	83160415	●*	●*
I (changeover)	X1-X2 (PCB straight-rear)	●	●	●	●*	●*
I (changeover)	X3 (PCB front)	83160143	●	●	●*	●*
R (normally closed)	W2 (solder)	83160001	●	●	●	●
R (normally closed)	W3 (QC 6.3x0.8)	83160003	83160319	●	83160621	●
R (normally closed)	W6 (QC 4.8x0.5)	●	●	●	●*	●*
R (normally closed)	X2-X3 (PCB rear-front)	●	●	●	●*	●*
C (normally open)	W2 (solder)	83160002	83160324	●	83160603	●
C (normally open)	W3 (QC 6.3x0.8)	83160004	83160316	83160402	83160622	●
C (normally open)	W6 (QC 4.8x0.5)	83160047	●	●	●*	●*
C (normally open)	X2-X3 (PCB rear-front)	●	●	●	●*	●*
Electrical characteristics						
Rating nominal / 250 V AC (A)		16	10	6	16	16
Rating nominal / 250 V DC (A) **		0.5	0.5	0.4	0.8	5
Rating thermal / 250 V (A)		20	15	10	20	20
Rating ENEC/UL / 250 V AC (A)		16(4) - 8 GP	10(4) - 8 GP	6(2) - 6 GP	16(4) - 10 GP	-
Mechanical characteristics						
Maximum operating force (N)		4	2	1	5	5
Min. Release force (N)		1.5	0.6	0.3	1	1
Maximum total travel force (N)		6.5	3	1.5	7	7
Max. Allowable overtravel force (N)		20	20	20	20	20
Rest position max. (mm)		15.6	15.6	15.6	15.7	15.7
Operating position (mm)		14.8 $\pm$ 0.3	14.8 $\pm$ 0.3	14.7 $\pm$ 0.3	14.6 $\pm$ 0.4	14.6 $\pm$ 0.4
Maximum differential travel (mm)		0.3	0.4	0.35	0.7	0.7
Min. overtravel CRA (mm)		1.3	1.3	1.3	1	1
Ambient operating temperature (°C)		-40 → +125	-40 → +125	-40 → +125	-40 → +125	-40 → +125
Mechanical life (operations)		10 <sup>7</sup>	10 <sup>7</sup>	10 <sup>7</sup>	10 <sup>6</sup>	10 <sup>6</sup>
Contact gap (mm)		1.2	1.2	1.2	3.2	3.2
Weight (g)		6.7	6.7	6.7	6.7	6.7

\* Please consult us    \*\* with resistive load

### Additional specifications

- Case, Button: PBT GF (UL 94-V0 / GWFI 960 °C)  
PA66 GF (GWFI 960 °C) - 831606 SP3697 case
- Contacts: silver alloy (gold-plated silver alloy : on request)
- Terminals: brass (except W2/X : copper nickel), silver plated common
- Levers: stainless steel or polyamide, polyamide roller

- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 250 (PTI 600 on 831606 SP3697)
- Recommended min actuating speed: 0.1 mm/s

- Conformity / Certifications: (except 831606 SP3697) /

### Product adaptations

- › Special levers: special shapes and lengths
- › Special connections: angled, screw with clamp (W5), full wiring with custom connector....
- › Telescopic plunger and adjustable fixing by threaded barrel: plastic version (153L accessory) or metal version (SP9603 or 83556, single or double pole)
- › High operating temperature: +150 °C
- › Variant for irradiated environment (SF1320)
- › 400 Vac ENEC/cURus approved versions (SP9654)
- › cURus/ENEC approvals for 831606 SP3697



Standard product

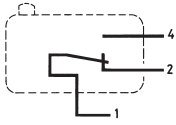
Product made to order



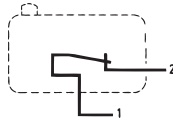
Contact us

## Principles

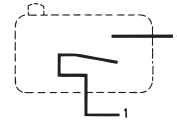
Single break snap-action switch  
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)

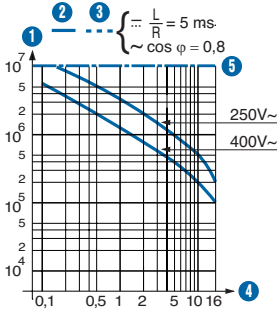


Normally open - SPST-NO (form A)



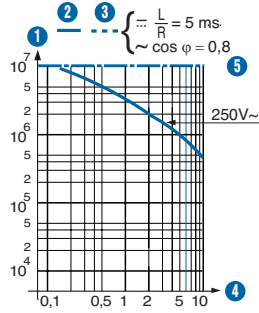
## Curves

Operating curve for type 831600



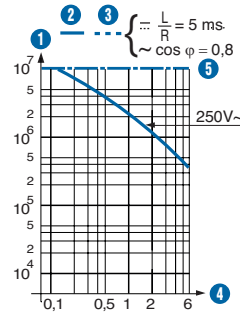
- 1 Number of cycles
- 2 Resistive circuit
- 3 Inductive circuit
- 4 Current in Amps
- 5 Mechanical life limit

Operating curve for type 831603



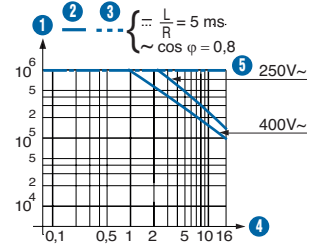
- 1 Number of cycles
- 2 Resistive circuit
- 3 Inductive circuit
- 4 Current in Amps
- 5 Mechanical life limit

Operating curve for type 831604



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

Operating curve for types 831606 and 831606 SP3697



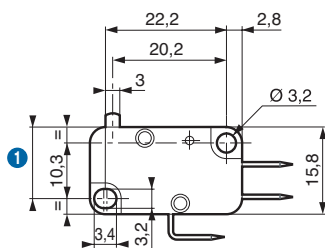
- 1 Number of cycles
- 2 Resistive circuit
- 3 Inductive circuit
- 4 Current in Amps
- 5 Mechanical life limit

DC electrical life for type 831606 SP3697: 250 V ~ 5 A resistif 300 000 cycles  
 250 V ~ 1,5 A L/R 5 ms 30 000 cycles  
 250 V ~ 0,5 A L/R 50 ms 50 000 cycles  
 125 V ~ 3 A L/R 5 ms 30 000 cycles

## Dimensions

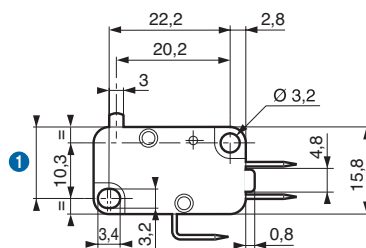
### Products

831600 / 3 / 4 / 6



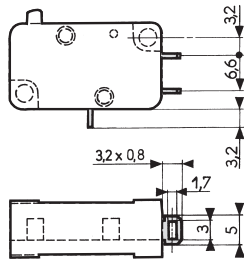
1 Total travel position = 13.2 max.

831606 SP3697

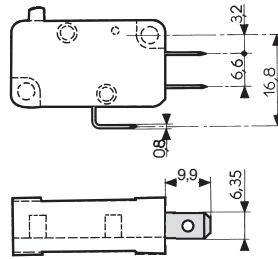


## Connections

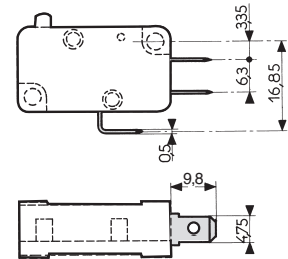
**W2 solder**



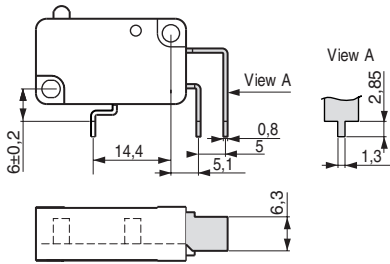
**W3 quick-connect 6.3 x 0.8**



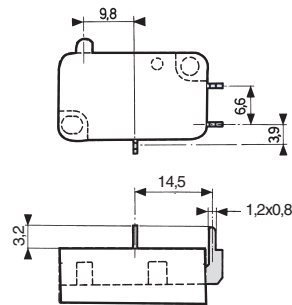
**W6 quick-connect 4.8 x 0.5**



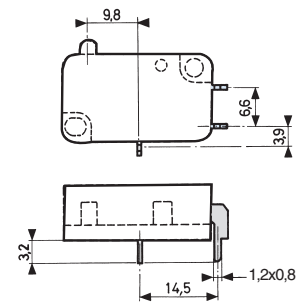
**X1 for PCB, straight output**



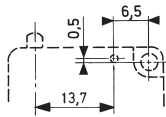
**X2 for PCB, rear output**



**X3 for PCB, front output**

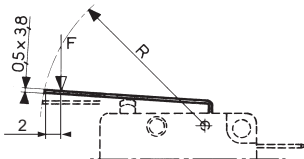


## Actuator mounting position

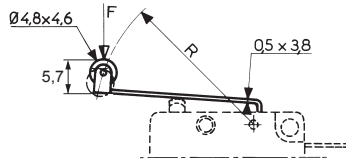


## Actuators

**153AX flat**






**153EX roller**



Other shapes and dimensions: consult us

## Actuators and mounting accessories

### Part numbers for standard actuators

		79211671*			79211672*			79211674*		
Actuators		Flat <b>153AX</b> R29.7			Roller <b>153EX</b> R15.8			Roller <b>153 EX</b> R28.7		
										
		<b>831600</b>	<b>831603</b>	<b>831606</b>	<b>831600</b>	<b>831603</b>	<b>831606</b>	<b>831600</b>	<b>831603</b>	<b>831606</b>
Operating position	mm	15.3 <sup>±0.5</sup>	15.3 <sup>±0.5</sup>	14.4 <sup>±0.6</sup>	20.5 <sup>±0.45</sup>	20.5 <sup>±0.45</sup>	20.3 <sup>±0.55</sup>	20.5 <sup>±0.65</sup>	20.5 <sup>±0.65</sup>	19.6 <sup>±0.75</sup>
Operating force - max.	N	2	1	2.6	4	2	5	2	1	2.6
Release force - min.	N	0.4	0.25	0.3	1	0.55	0.75	0.4	0.25	0.3
Pretravel - max.	mm	2.5	2.5	3.1	1.2	1.2	1.4	2.5	2.5	3.1
Differential travel max.	mm	0.6	0.8	1.5	0.3	0.4	0.7	0.6	0.8	1.5
Total travel max.	mm	4.6	4.6	4.6	2.3	2.3	2.3	4.6	4.6	4.6

\*We recommend that levers are mounted in our factories. See preferred part numbers in table below.

For unmounted supply, please also order associated pin **79210424**

### Part numbers for standard actuators

Actuators

**79211694\***

**79211668\***

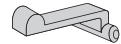
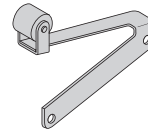
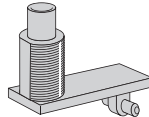
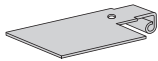
Two-pole **153A2XB** R24\*\*

Dummy roller **153FX** R24.3\*\*

Telescopic plunger **153L\*\***

Flexible with roller **153B\*\***

Plastic **153 V\*\***



\*\* Please consult us

### 83160 microswitches with referenced actuators

Actuators		153AX R29.7	153EX R15.8	153EX R28.7
		79211671	79211672	79211674
<b>831600</b>	I W2	●	83160134	83160038
	I W3	83160067	83160029	83160065
	I W6	83160115	83160069	●
<b>831603</b>	I W2	83160345	●	●
	I W3	83160347	83160327	83160329
	I W6	●	●	●
<b>831606</b>	I W2	●	●	●
	I W3	●	83160669	83160674
<b>831606 SP3697</b>	I W2	●	83160681	83160689
	I W3	●	83160680	83160690

## 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\* - Adaptation\*

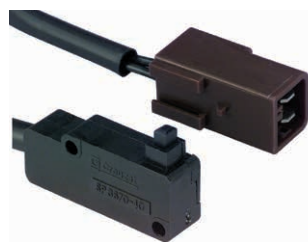
\* if needed

Example: 831600 I X1 153AX R29.7

## Examples of special adaptations



Special lever and angled W3 terminals



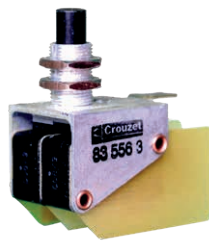
Full wiring with custom connector



Customised version for nuclear application. Has radiation-resistant housing, 180 °C max operating temperature, W5 screw terminals and magnetic blowout for highly inductive circuit switching at 250 V $\overline{\text{=}}$



Telescopic plunger with Ø12 mm adjustable fixing and 4 mm overtravel. Metal version for heavy duty (SP9603)



Telescopic plunger with Ø10 mm threaded barrel, metal bracket and plastic button. Single pole or double pole with staggered switchings (83556)

### Warning:

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