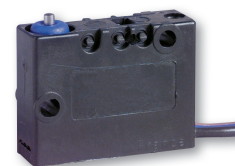


# MINIATURE MICROSWITCHES - SEALED

## V3S - 83169

- › High precision flexible leaf snap-action mechanism
- › Operation without balance-point, even at extremely slow actuating speed
- › Excellent resistance to harsh environments - IP67/IP69 protection
- › High resistance to shock and vibration - Very long life
- › Operating temperature -40 °C up to 130 °C
- › Wire lead or cable output
- › Tight switching hysteresis versions: 0.07 mm max differential travel
- › Ratings from 1 mA 4 V<sub>DC</sub> to 8 A 250 V<sub>AC</sub> and 1/4 HP 125-250 V<sub>AC</sub>
- › Wide choice of actuators on 4 possible fixing positions (pre-assembled or retrofittable)



### Main specifications

|                                          |                 | Standard<br>831690  | Reduced differential<br>travel<br>831694 | Dual-current<br>831698 | Dual-current<br>Reduced differential<br>travel<br>831699 |
|------------------------------------------|-----------------|---------------------|------------------------------------------|------------------------|----------------------------------------------------------|
| Function                                 | Connections     |                     |                                          |                        |                                                          |
| I (changeover)                           | D0.5            | 83169002            | 83169405                                 | 83169802               | 83169905                                                 |
| I (changeover)                           | G0.5            | 83169001            | 83169404                                 | 83169801               | 83169904                                                 |
| I (changeover)                           | C0.5            | 83169015            | 83169406                                 | 83169803               | 83169906                                                 |
| I (changeover)                           | Y0.5            | 83169046            | 83169442                                 | 83169820               | 83169913                                                 |
| I (changeover)                           | D - G - C - Y * | ●                   | ●                                        | ●                      | ●                                                        |
| R (normally closed)                      | D - G - C - Y * | ●                   | ●                                        | ●                      | ●                                                        |
| C (normally open)                        | D - G - C - Y * | ●                   | ●                                        | ●                      | ●                                                        |
| * wire length or cable length on demand  |                 |                     |                                          |                        |                                                          |
| Electrical characteristics               |                 |                     |                                          |                        |                                                          |
| Rating nominal / 250 V AC (A)            |                 | 8                   | 5                                        | 5**                    | 5**                                                      |
| Rating thermal / 250 V AC (A)            |                 | 10                  | 6                                        | 6                      | 6                                                        |
| Mechanical characteristics               |                 |                     |                                          |                        |                                                          |
| Maximum operating force (N)              |                 | 4.5                 | 4.5                                      | 4.5                    | 4.5                                                      |
| Min. Release force (N)                   |                 | 1                   | 1                                        | 1                      | 1                                                        |
| Maximum total travel force (N)           |                 | 8                   | 8                                        | 8                      | 8                                                        |
| Max. Allowable overtravel force (N)      |                 | 20                  | 20                                       | 20                     | 20                                                       |
| Rest position max. (mm)                  |                 | 15.9                | 15.9                                     | 15.9                   | 15.9                                                     |
| Operating position (mm)                  |                 | 14.7±0.5            | 14.7±0.5                                 | 14.7±0.5               | 14.7±0.5                                                 |
| Maximum differential travel (mm)         |                 | 0.35                | 0.07                                     | 0.35                   | 0.07                                                     |
| Min. overtravel (mm)                     |                 | 1                   | 0.4                                      | 1                      | 0.4                                                      |
| Ambient operating temperature-wires (°C) |                 | -40 → +105 °C       | -40 → +105 °C                            | -40 → +105 °C          | -40 → +105 °C                                            |
| Ambient operating temperature-cable (°C) |                 | -40 → +90 °C        | -40 → +90 °C                             | -40 → +90 °C           | -40 → +90 °C                                             |
| Mechanical life (operations)             |                 | 5 x 10 <sup>6</sup> | 5 x 10 <sup>6</sup>                      | 5 x 10 <sup>6</sup>    | 5 x 10 <sup>6</sup>                                      |
| Contact gap (mm)                         |                 | 0.4                 | 0.4                                      | 0.4                    | 0.4                                                      |
| Weight (g)                               |                 | 30                  | 30                                       | 30                     | 30                                                       |

### Additional specifications

- Case: PBT GF (UL 94-V0 / GWFI 960 °C)
- Button: stainless steel
- Membrane: fluorosilicone rubber
- Moving blade: silver-plated beryllium copper
- Contacts: silver alloy, micro-profile  
gold alloy on silver alloy, crossbar (dual-current)
- Wire leads, cable: copper, PVC insulated
- Levers: stainless steel, polyamide roller
- Degree of protection: IP67/IP69
- Protection against electric shock : models with cable output on left are suitable for Class II equipment up to 250 V without additional protection
- Recommended min actuating speed: 0.001 mm/s

### Product adaptations



- › Special levers: special shapes and lengths, flexible levers, adjustable, pinned, ....
- › Special leads and cables, EN 50306 halogen free versions, full wiring with custom connector
- › High operating temperature: +130 °C
- › Long overtravel variant (min 3.5 mm) with metal or plastic plunger, also suitable for lateral approach up to 30° (SP4978, SP4988)
- › Adjustable fixing by threaded barrel: see 83581
- › Reinforced housing with metal insert and cable output for very severe conditions
- › Variant with plastic button for double insulation (SP4965)
- › Integrated varistor for extended service life on DC inductive load
- › cURus approved versions

Standard product

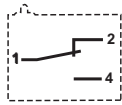
Product made to order



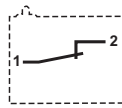
Contact us

## Principles

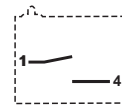
### Single break snap-action switch Changeover - SPDT (form C)



### Normally closed - SPST-NC (form B)

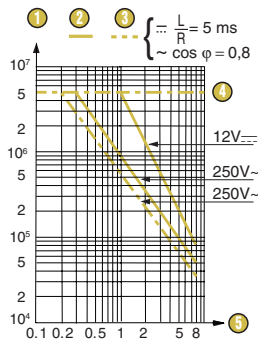


### Normally open - SPST-NO (form A)

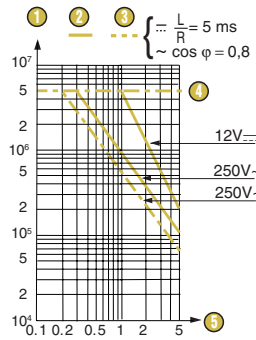


## Curves

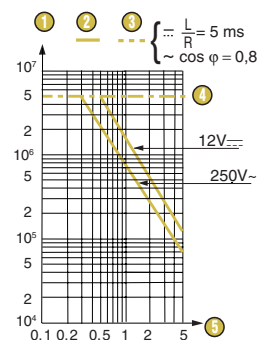
### Operating curve for type 831690



### Operating curve for type 831694



### Operating curve for types 831698/831699



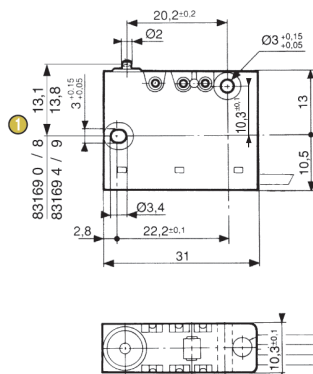
- ① Number of cycles
- ② Resistive circuit
- ③ Inductive circuit
- ④ Mechanical life limit
- ⑤ Current in Amps

\*\* Models 831698 and 831699 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

### Product

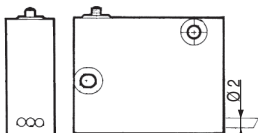
83169



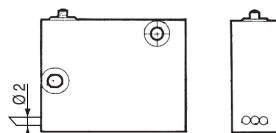
① Total travel position

## Connections

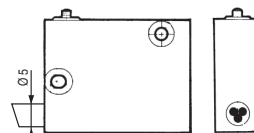
### D wire output on right



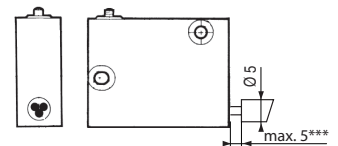
### G wire output on left



### C cable output on left



### Y cable output on right



\*\*\*Outer jacket stripping

Wire characteristics:

- 1: black (common)
- 2: brown (NC)
- 4: blue (NO)

Cross section: 1 mm<sup>2</sup>

Standard length: 0.5 m (other lengths on request)

Cable characteristics:

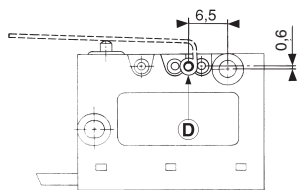
- 1: black (common)
- 2: brown (NC)
- 4: grey (NO)

Cross section: 3 x 0.75 or 2 x 0.75 mm<sup>2</sup>

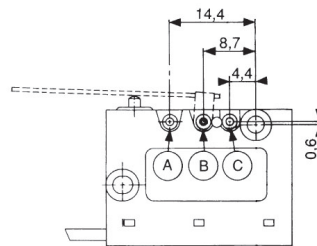
Standard length: 0.5 m (other lengths on request)

## Actuator mounting positions

### 139-type levers (pinned)

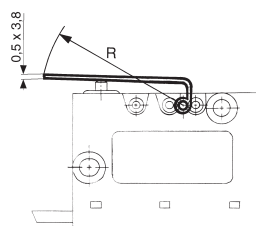


### 161-type levers (clipped-on)

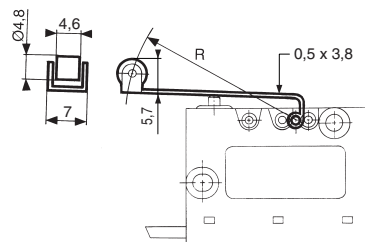


## Actuators

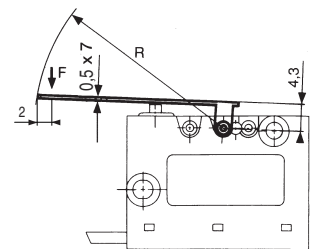
### 139AX flat



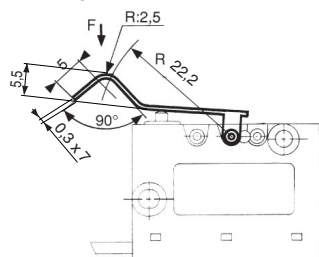
### 139EX roller



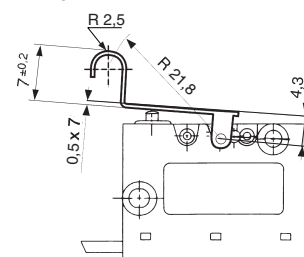
### 161A flat



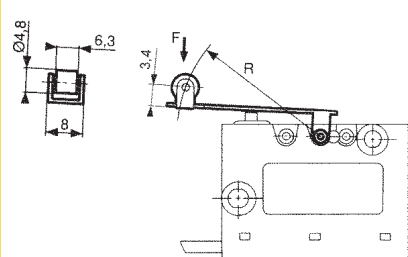
### 161F dummy roller



### 161G dummy roller



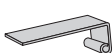
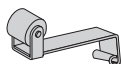
### 161E roller



Other shapes and dimensions: consult us

## Actuators and mounting accessories

### Part numbers for standard actuators

| Part numbers for standard actuators      |  | 79215740                                                                          |                |                                                                                   | 70507524       |                                                                                    |                | 79215742     |                                                                                     | 70507529       |                |                |                |                |
|------------------------------------------|--|-----------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------|----------------|--------------|-------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|
| Actuators                                |  | Flat <b>139 AX</b><br>R29.7*                                                      |                | Roller <b>139 EX</b><br>R28.7*                                                    |                | Flat <b>161A</b><br>R14.2                      R25.4                               |                |              | Roller <b>161E</b><br>R13.6                      R24.1                              |                |                |                |                |                |
|                                          |  |  |                |  |                |  |                |              |  |                |                |                |                |                |
| Fixing position                          |  | D                                                                                 | D              | A                                                                                 | B              | A                                                                                  | B              | C            | A                                                                                   | B              | A              | B              | C              |                |
| Operating force - max.                   |  | N                                                                                 | 2.5            | 2.5                                                                               | 2.5            | 4.5                                                                                | 1.4            | 2.5          | 3.5                                                                                 | 2.5            | 4.5            | 1.4            | 2.5            | 3.5            |
| Release force - min.                     |  | N                                                                                 | 0.4            | 0.4                                                                               | 0.5            | 1                                                                                  | 0.25           | 0.5          | 0.6                                                                                 | 0.5            | 1              | 0.25           | 0.5            | 0.6            |
| Operating position                       |  | mm                                                                                | 14.3 $\pm$ 1.2 | 19.4 $\pm$ 1.3                                                                    | 15.1 $\pm$ 1.2 | 15.2 $\pm$ 0.6                                                                     | 14.5 $\pm$ 2.4 | 15 $\pm$ 1.2 | 15.2 $\pm$ 0.9                                                                      | 20.4 $\pm$ 1.2 | 20.5 $\pm$ 0.6 | 19.7 $\pm$ 2.4 | 20.1 $\pm$ 1.2 | 20.3 $\pm$ 0.9 |
| Differential travel - max.<br>(831690/8) |  | mm                                                                                | 1.2            | 1.2                                                                               | 0.8            | 0.4                                                                                | 1.6            | 0.8          | 0.6                                                                                 | 0.8            | 0.4            | 1.6            | 0.8            | 0.6            |

### Part numbers for standard actuators

|                                        |    | 70507528                                                                          |                | 79218651                                                                          |                |
|----------------------------------------|----|-----------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------|----------------|
| Actuators                              |    | Dummy roller <b>161F</b> R22.2                                                    |                | Dummy roller <b>161G</b> R21.8                                                    |                |
|                                        |    |  |                |  |                |
| Fixing position                        |    | A                                                                                 | B              | A                                                                                 | B              |
| Operating force - max.                 | N  | 1.5                                                                               | 2.6            | 1.5                                                                               | 2.6            |
| Release force - min.                   | N  | 0.25                                                                              | 0.5            | 0.25                                                                              | 0.5            |
| Operating position                     | mm | 19.8 $\pm$ 2.2                                                                    | 20.2 $\pm$ 1.1 | 20.8 $\pm$ 2.2                                                                    | 21.2 $\pm$ 1.1 |
| Differential travel max.<br>(831690/8) | mm | 1.6                                                                               | 0.8            | 1.6                                                                               | 0.8            |

Unless mentioned specifically, 161-type levers are supplied unassembled.

For factory mounting, specify mounting position A, B or C.

\* 139-type levers are factory mounted.

Note: We recommend greasing the switch button lightly when fitting actuators.

### V3S-83169 microswitches with referenced actuators

| Actuators     | 161A R14.2 |          | 161A R25.4 |          |          | 161E R13.6 |          | 161E R24.1 |          |          | 139EX<br>R28.7 |
|---------------|------------|----------|------------|----------|----------|------------|----------|------------|----------|----------|----------------|
|               | 79215740   |          | 70507524   |          |          | 79215742   |          | 70507529   |          |          |                |
|               | Pos A      | Pos B    | Pos A      | Pos B    | Pos C    | Pos A      | Pos B    | Pos A      | Pos B    | Pos C    | Pos D          |
| 831690 I D0.5 | 83169003   | 83169004 | 83169005   | 83169006 | 83169007 | 83169008   | 83169009 | 83169010   | 83169011 | 83169012 | 83169017       |
| 831698 I D0.5 | ●          | ●        | ●          | ●        | ●        | ●          | 83169819 | ●          | ●        | ●        | 83169818       |

## 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 - UL approval\* - Actuator\* - Fixing position\* - Adaptation\*

\* if needed

Example: 831690 R D1.50 UL 161E R24.1 B

Standard product

Product made to order



Contact us



## Examples of special adaptations



Long overtravel variant with plastic plunger and reinforced housing (SP4988)



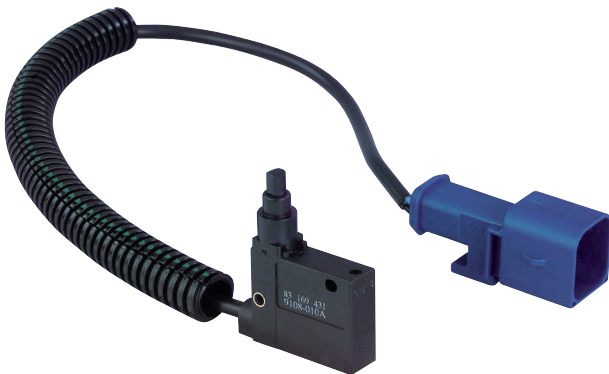
Long overtravel variant with metal plunger (SP4978)



Adjustable fixing by threaded barrel and telescopic plunger: see 83581



Double insulation model with plastic plunger (SP4965)



Full wiring with custom connector