

MINIATURE MICROSWITCHES - PREMIUM

V3 - 83161

- › High precision flexible leaf snap-action mechanism
- › Operation without balance-point, even at extremely slow actuating speed
- › Broad range of operating forces from 0.15 N to 5 N
- › Ratings from 4 A to 20(8) A 250 V~, 10(4) A 400 V~ and 1/2 hp 125-250 V~
- › Contact gap less or greater than 3 mm (micro-disconnection (μ) or full disconnection)
- › Operating temperature from -60 °C up to +150 °C - High resistance to shock and vibration
- › Mechanical life up to 50 million cycles
- › ENEC and cURus approved
- › Wide choice of actuators on 4 possible fixing positions (pre-assembled or retrofittable)



Main specifications

Function	Connections	Standard 831613		High current 831612		
		Standard	UL	Standard	UL	UL SP4186
I (changeover)	W2 (solder)	83161301	83161348	●	83161273	●
I (changeover)	W3 (QC 6.3x0.8)	83161338	83161344	83161241	83161244	●
I (changeover)	W6A5 (QC 4.8x0.5)	83161304	83161343	●*	●*	-
I (changeover)	W3R5 (QC 6.3x0.8, Rast 5)	83163023	83163107	●*	●*	●*
I (changeover)	W5 (screw + clamp)	83161303	83161349	●*	●*	-
I (changeover)	W6D8 (QC 4.8x0.8)	83161305	83161341	●*	●*	-
I (changeover)	W7A5 (QC 2.8x0.5)	83161309	83161350	-	-	-
I (changeover)	2W7A8 (QC 2.8x0.8, double)	83161310	●	●*	●*	-
R (normally closed)	W2 (solder)	83161316	83163041	●	83161274	●
R (normally closed)	W3 (QC 6.3x0.8)	83161311	83163066	●	●	●
R (normally closed)	W6A5 (QC 4.8x0.5)	83161359	●	●*	●*	-
R (normally closed)	W3R5 - W5 - W6D8 - W7A5 - 2W7A8	●	●	●*	●*	●*
C (normally open)	W2 (solder)	83161315	●	●	●	●
C (normally open)	W3 (QC 6.3x0.8)	83161312	83161346	●	●	●
C (normally open)	W6A5 (QC 4.8x0.5)	83161325	●	●*	●*	-
C (normally open)	W3R5 - W5 - W6D8 - W7A5 - 2W7A8	●	●	●*	●*	●*
Electrical characteristics						
Rating nominal / 250 V AC (A)		16		20		
Rating thermal / 250 V AC (A)		20		22		
Rating ENEC/NF / 250 V AC (A)		16(4)	16(4)	20(8)	20(8)	20(8)
Rating UL / 125/250 V AC (A)		-	16 - 1/2hp	-	15.1 - 1/2hp	20.1 - 1/2hp
Mechanical characteristics						
Maximum operating force (N)		0.8		1**		
Min. Release force (N)		0.2		0.2		
Maximum total travel force (N)		2		2.5		
Max. Allowable overtravel force (N)		20		20		
Maximum rest position (mm)		16.2		16.1		
Operating position (mm)		14.7±0.3		14.7±0.4		
Maximum differential travel (mm)		0.35		0.35		
Min. overtravel (mm)		1.2		1.1		
Ambient operating temperature (°C)		-60 → +125		-60 → +125		
Mechanical life for 2/3 OT (operations)		2 x 10 ⁷		2.5 x 10 ⁵		
Contact gap (mm)		0.4		0.4		
Weight (g)		5.6		5.6		

* Please consult us

** Also available with 3N operating force (831612 SP4165)

Additional specifications

- Case: PA6 GF (UL 94-V2 / GWFI 960 °C) - Standard versions
- PBT GF (UL 94-V0 / GWFI 960 °C) - UL versions
- PET GF (UL 94-V0 / GWFI 960 °C / GWIT 775 °C) - On request
- Button: PA66
- Moving blade: silver-plated beryllium copper
- Contacts: silver alloy, micro-profile (831612: silver cadmium oxyde)
- Terminals: brass (except W2 : copper nickel)
- Levers: stainless steel or polyamide, polyamide roller
- Nuts for 161L: nickel-plated brass

- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 250
- Protection against electric shock: button and 161-type actuators have reinforced insulation for Ui 250V / Uimp 2,5kV / pollution 2
- Recommended min actuating speed: 0.001 mm/s

- Certification marks: Standard versions:
 UL versions:

Standard product

Product made to order

● Contact us



Main specifications (continued)

High force 831611		Low force 831614		Very low force 831615		Ultra low force 831615 SP4136		Wide contact gap 831616		Func.	Conn.
Standard	UL	Standard	UL	Standard	UL	Standard	UL	Standard	UL		
83161102	83161058	83161402	83161431	83161502	●	83161520	●	83161601	●	I	W2
83161118	83161165	83161401	●	83161501	83161513	83161519	83161573	83161602	83161636	I	W3
83161110	83161182	83161403	83161407	83161503	83161508	●	83161577	●*	●*	I	W6A5
●	●	●	●	83161516	83161518	●	83161575	83161619	●	I	W3R5
83161113	83161055	●	83161408	83161509	83161511	●	●	83161603	●	I	W5
83161123	●	●	83161429	83161507	●	●	●	●	●	I	W6D8
83161189	●	83161405	●	●	●	●	●	●*	●*	I	W7A5
83161059	●	●	●	●	●	●	●	●*	●*	I	2W7A8
83161117	●	●	●	83161595	●	●	●	83161609	●	R	W2
83161109	●	●	●	83161528	●	●	●	83161605	●	R	W3
83161070	●	83161424	●	●	●	●	●	●*	●*	R	W6A5
●	●	●	●	●	●	●	●	●*	●*	R	Others
83161104	83161082	●	83161435	●	●	83161589	●	●	●	C	W2
83161103	83161188	83161404	83161412	●	●	●	●	83161606	●	C	W3
83161125	83161111	●	●	83161504	●	●	●	●*	●*	C	W6A5
●	●	●	●	●	●	●	●	●*	●*	C	Others
Electrical											
16		10		4		4		12			Nom rating (A)
20		12		5		5		15			Therm rating (A)
16(4)	16(4)	10(3)	10(3)	4(1)	4(1)	4(1)	4(1)	12(3)	12(3)		ENEC rating (A)
-	16 - 1/2hp	-	6 - 1/4hp	-	4 - 1/10hp	-	4 - 1/10hp	-	6.1 - 1/3hp		UL rating (A)
Mechanical											
3		0.5		0.25		0.15		5			OF max (N)
1		0.1		0.05		0.04		0.5			RF min (N)
4.5		1.5		0.40		0.2		6			TTF max (N)
20		20		20		20		20			AOF max (N)
16.1		16.2		16.3		16.3		16.1			RP max (mm)
14.7±0.4		14.7±0.4		14.7±0.4		14.7±0.3		14.5±0.4			OP (mm)
0.35		0.35		0.35		0.35		0.8			DT max (mm)
1.1		1.1		1.1		1.2		0.9			OT min (mm)
-60 → +125		-60 → +125		-40 → +125		-40 → +125		-60 → +125			Temp (°C)
10 ⁷		3 x 10 ⁷		5 x 10 ⁷		5 x 10 ⁷		5 x 10 ⁴			Mech. life (op)
0.4		0.4		0.4		0.4		3.2			Gap (mm)
5.6		5.6		5.6		5.6		5.6			Weight (g)

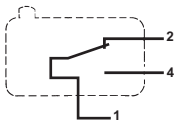
Product adaptations



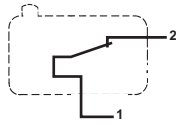
- ▶ Special levers: special shapes and lengths, flexible levers, adjustable, two-pole, pinned,
- ▶ Special connections: angled, with 7mm spacing (RAST 7-W3R7), for PCB, long solder (W2L),...
- ▶ High operating temperature: +150 °C
- ▶ Special contacts (for gold plated contacts: see "V3 Dual-current - 83161")
- ▶ Reduced or increased switching hysteresis: max 0.1 mm to max 0.8 mm differential travel
- ▶ Specific operating force easily achievable
- ▶ Telescopic plunger and adjustable fixing by threaded barrel: plastic version (161L accessory) or metal version (SP9603)
- ▶ Housing material complying with IEC 60335-1 for unattended appliances: GWFI 850° C / GWIT 775° C (SP9680)
- ▶ 400 V~ ENEC approved versions

Principles

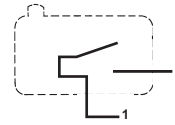
Single break snap-action switch
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)

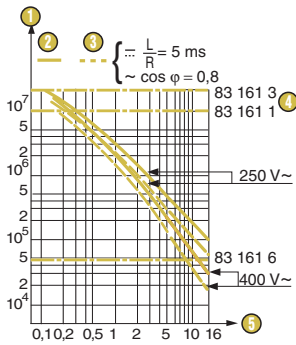


Normally open - SPST-NO (form A)



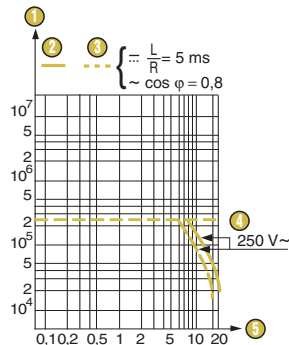
Curves

Operating curve for types
831611* / 831613* / 831616



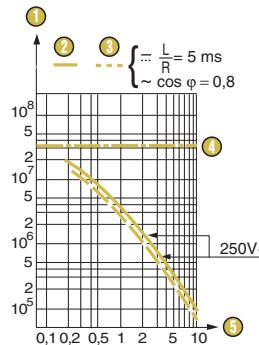
- 1 Number of cycles
- 2 Resistive circuit
- 3 Inductive circuit
- 4 Mechanical life limit
- 5 Current in Amps

Operating curve for type 831612



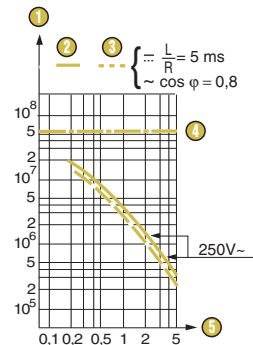
- 1 Number of cycles
- 2 Resistive circuit
- 3 Inductive circuit
- 4 Mechanical life limit
- 5 Current in Amps

Operating curve for type 831614



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

Operating curve for types
831615 / 831615 SP 4136



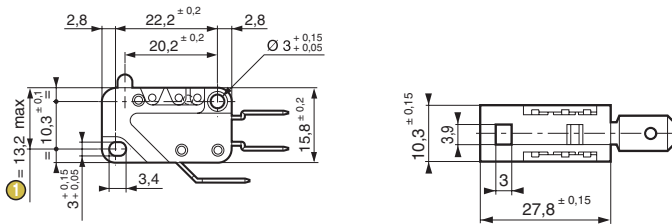
- 1 Number of cycles
- 2 Resistive circuit
- 3 Inductive circuit
- 4 Mechanical life limit
- 5 Current in Amps

* For 831611 UL and 831613 UL: please consult us

Dimensions

Product

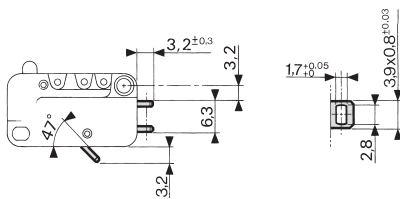
83161



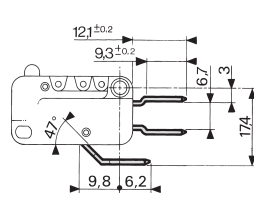
- 1 Total travel position

Connections

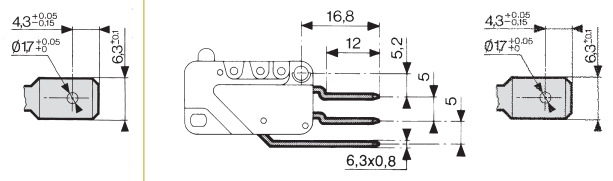
W2 solder



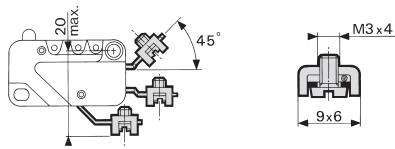
W3 quick-connect 6.3 x 0.8



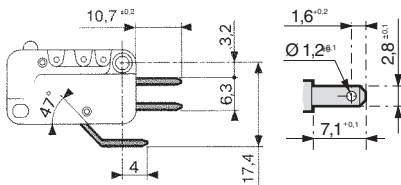
W3R5 quick-connect 6.3 x 0.8
for RAST 5 connector



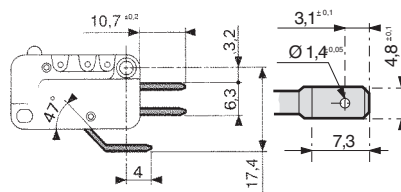
W5 screw with clamp



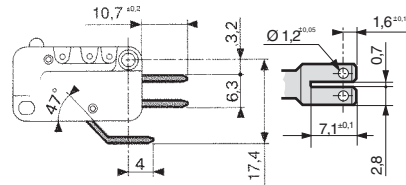
W7A5 quick-connect 2.8 x 0.5



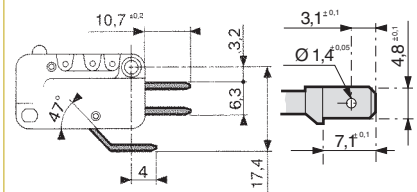
W6A5 quick-connect 4.8 x 0.5



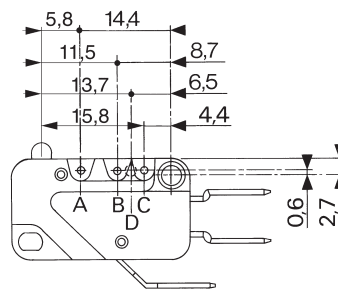
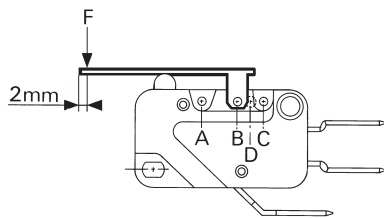
2W7A8 quick-connect 2.8 x 0.8, double



W6D8 quick-connect 4.8 x 0.8



Actuator mounting positions



To calculate force

Divide the switch force by the coefficient given in the table.

To calculate travel

Multiply the switch travel by the same coefficient.

Example :

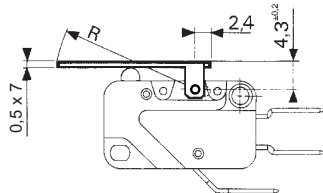
83 161 3 with lever 161 A - R 25.4 position A (coeff. 4)

Operating force: $0.8 : 4 = 0.2 \text{ N}$

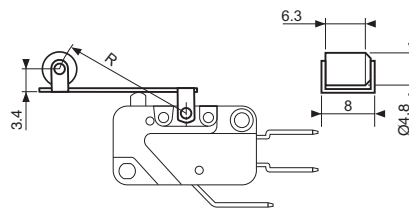
Overtravel: $1.2 \times 4 = 4.8 \text{ mm}$

Actuators

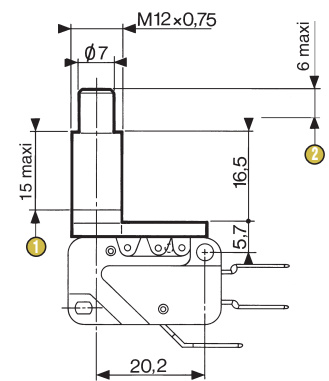
161A flat



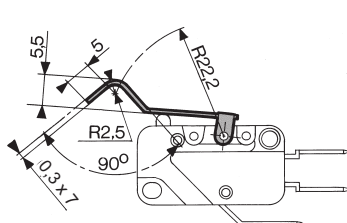
161E roller



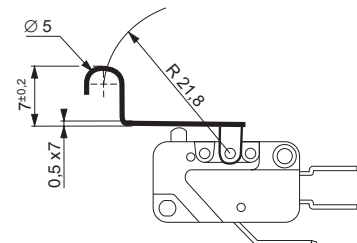
161L telescopic plunger



161F dummy roller



161G dummy roller

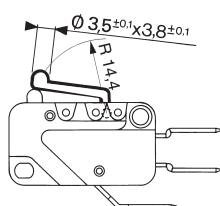


① Thread length

② Total travel

Nut thickness	Max. torque
1,5 mm	0.5 N.m
2 mm	0.7 N.m
2,5 mm	1 N.m

161V plastic

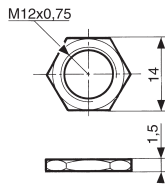


Other shapes and dimensions: consult us

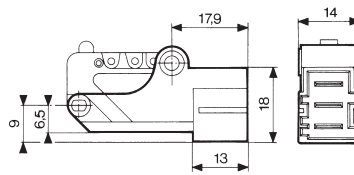
Also available are pinned actuators mounted on position D (factory mounting), same as for 83160 series. (datasheet: SP9640)

Mounting accessories

Nut for 161L



Housing 161J for connections W3 R5



Actuators and mounting accessories

Part numbers for standard actuators	79215740	70507524	79215742	70507529	70507528
Actuators	Flat 161A R14.2	Flat 161A R25.4	Roller 161E R13.6	Roller 161E R24.1	Dummy roller 161F R22.2
Fixing positions	A B	A B C	A B	A B C	A B
Coefficient	2 1	4 2 1.5	2 1	4 2 1.5	3.6 1.8
Operating position, except 831616 (mm)	15.2 ±1 15.2 ±0.45	15.2 ±2.5 15.2 ±1 15.2 ±0.8	20.5 ±1.5 20.5 ±0.8	20.5 ±2.9 20.5 ±1.5 20.5 ±1.2	20.4 ±2 20.4 ±0.7
Operating position 831616 (mm)	14.8 ±1 15 ±0.45	15.2 ±2.5 14.8 ±1 14.9 ±0.8	20.1 ±1.5 20.3 ±0.8	19.7 ±2.9 20.1 ±1.5 20.2 ±1.2	20.2 ±2 20.2 ±0.7

Part numbers for standard actuators	79218651	**Telescopic plunger 161L	Manual actuation	Plastic 161V	Housing 161J	Nut for 161L
Actuators	Dummy roller 161G R21.8					
Fixing positions	A B C	D		D		
Coefficient	3.6 1.8 1.2	1		1		
Operating position, except 831616 (mm)	21.7 ±2 21.7 ±0.7 21.7 ±0.5	21.5 ±1		18.55 ±0.45		
Operating position 831616 (mm)	21.5 ±2 21.5 ±0.7 21.5 ±0.5	21.5 ±1		18.35 ±0.45		

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

** For 831611, 831612, 831613, 831616. Mounted in factory (supplied without nut)

V3-83161 microswitches with referenced actuators

Actuators	161A R14.2 79215740		161A R25.4 70507524			161E R13.6 79215742		161E R24.1 70507529			161L
	Pos A	Pos B	Pos A	Pos B	Pos C	Pos A	Pos B	Pos A	Pos B	Pos C	Pos D
	831611 I W2 STD UL	83161020 ●	83161021 ●	83161022 ●	83161023 ●	83161024 ●	83161025 ●	83161026 ●	83161027 ●	83161028 ●	83161029 ●
I W3 STD UL	83161032 ●	83161033 ●	83161034 ●	83161035 ●	83161036 ●	83161037 ●	83161038 ●	83161039 ●	83161040 ●	83161041 ●	83161064 83161098
I W6A5 STD UL	83161044 ●	83161045 ●	83161046 ●	83161177 ●	83161047 ●	83161048 ●	83161049 ●	83161050 ●	83161051 ●	83161052 ●	● ●
831613 I W2 STD UL	83163067 ●	83163068 ●	83163069 ●	83163015 ●	83163071 ●	83163072 ●	83163073 ●	83163074 ●	83163016 ●	83163075 ●	83161320
I W3 STD UL	83163078 ●	83163079 ●	83163080 ●	83163081 83161328	83163082 ●	83163083 ●	83161374 83163221	83163084 ●	83163007 ●	83163085 ●	83161318 83163102
I W6A5 STD UL	83163088 ●	83163089 ●	83163090 ●	83163091 83161327	83163092 ●	83163093 ●	83163094 83163222	83163095 ●	83163096 83163220	83163097 ●	● 83161352
831615 I W2 STD UL	83161529 ●	83161530 ●	83161531 ●	83161532 ●	83161533 ●	83161534 ●	83161535 ●	83161536 ●	83161537 ●	83161538 ●	- -
I W3 STD UL	83161541 ●	83161542 ●	83161543 ●	83161544 ●	83161545 ●	83161546 ●	83161547 ●	83161548 ●	83161514 ●	83161549 ●	- -
I W6A5 STD UL	83161552 ●	83161553 ●	83161554 ●	83161526 ●	83161555 ●	83161556 ●	83161557 ●	83161558 ●	83161559 ●	83161560 ●	- -
831616 I W3 STD UL	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	● ●	83161615 ●

Standard product

Product made to order

● Contact us

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* + Mounting accessories*
* if needed

Example: 831613 C W3R5 UL 161E R13.6 B SP9680 + 79250338

Examples of special adaptations



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



Door switch for industrial vehicle



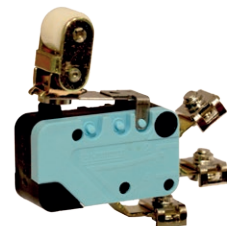
Angled W3 terminals



RAST 7mm - W3R7 connections



Long solder terminals (W2L)



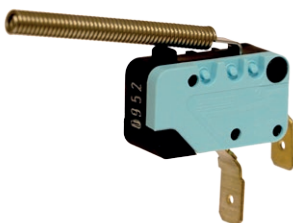
One-way roller lever (active on right, idle-return on left)



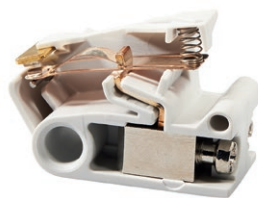
Lever fitted with POM ramp for transverse actuation



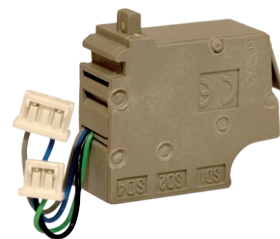
Two-pole lever



Spring lever for extra-long overtravel



Fully specific integrable switching module with terminal block for time switch



Auxiliary contact for power switches and circuit breakers. Integrates the V3-83161 mechanism

Warning:

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Product adaptations

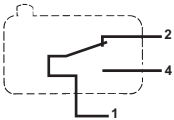


- › Special levers: special shapes and lengths, flexible levers, adjustable, two-pole, pinned,
- › Special connections: angled, with 7mm spacing (RAST 7-W3R7), for PCB, long solder (W2L), ...
- › High operating temperature: +150 °C
- › Reduced or increased switching hysteresis: max 0.1 mm to max 0.8 mm differential travel
- › Specific operating force easily achievable
- › Telescopic plunger and adjustable fixing by threaded barrel: plastic version (161L accessory) or metal version (SP9603)
- › Housing material complying with IEC 60335-1 for unattended appliances: GWFI 850° C / GWIT 775° C (SP9680)

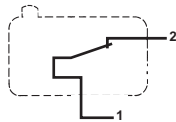
Principles

Single break snap-action switch

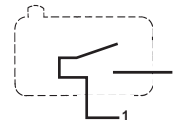
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)

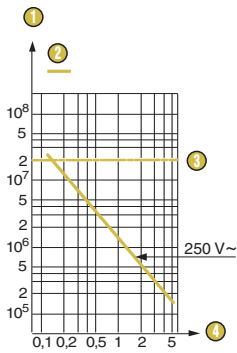


Normally open - SPST-NO (form A)



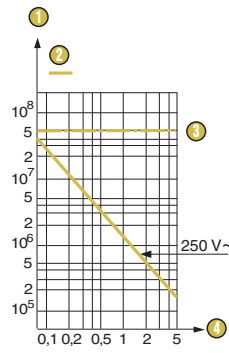
Curves

Operating curve for type 831618 and 831618 SP 4174



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

Operating curve for types 831619 and 831619 SP 4136



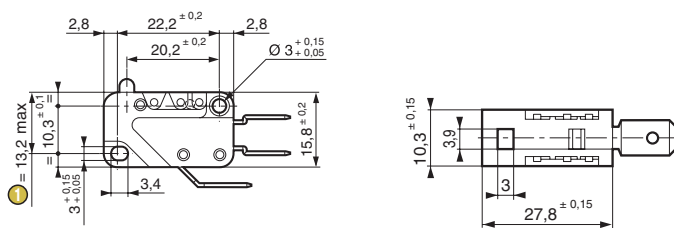
- 1 Number of cycles
- 2 Resistive circuit
- 3 Mechanical life limit
- 4 Current in Amps

* These models 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

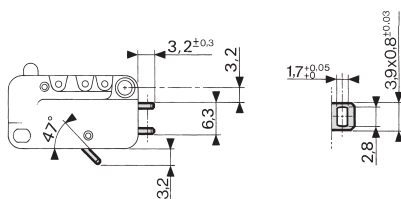
83161



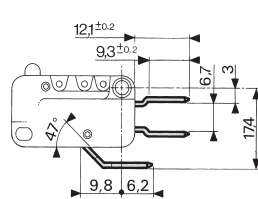
1 Total travel position

Connections

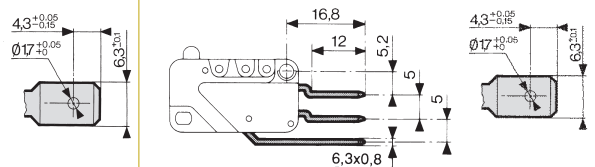
W2 solder



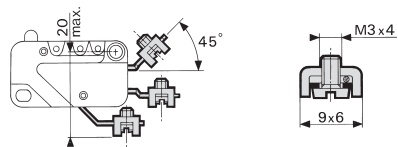
W3 quick-connect 6.3 x 0.8



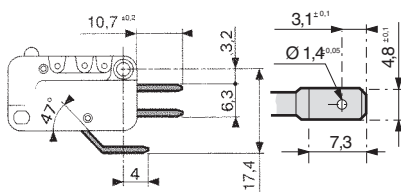
W3R5 quick-connect 6.3x0.8 for RAST 5 connector



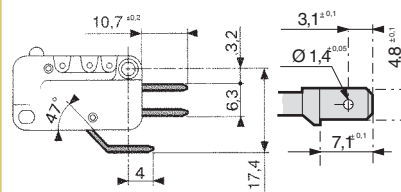
W5 screw



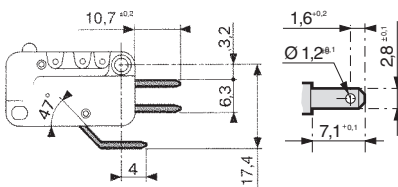
W6A5 quick-connect 4.8 x 0.5



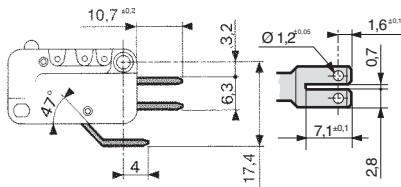
W6D8 quick-connect 4.8 x 0.8



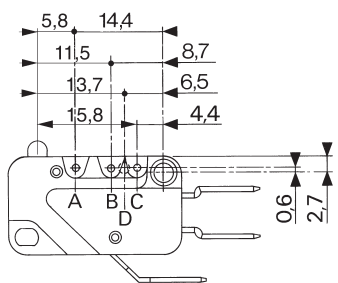
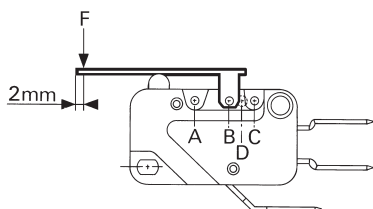
W7A5 quick-connect 2.8 x 0.5



2W7A8 quick-connect 2.8 x 0.8, double



Actuator mounting positions



To calculate force

Divide the switch force by the coefficient given in the table.

To calculate travel

Multiply the switch travel by the same coefficient.

Example :

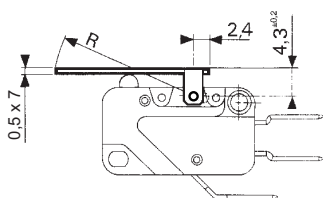
83 161 8 with lever 161 A - R 25.4 position A (coeff. 4)

Operating force: $0.8 : 4 = 0.2 \text{ N}$

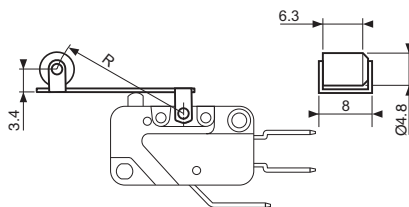
Overtravel: $1.2 \times 4 = 4.8 \text{ mm}$

Actuators

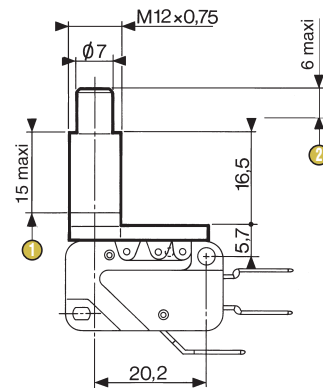
161A flat



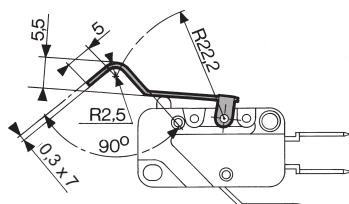
161E roller



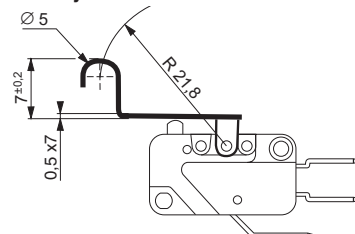
161L telescopic plunger



161F dummy roller



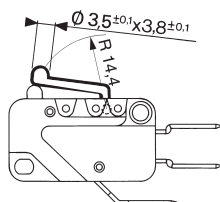
161G dummy roller



- 1 Thread length
- 2 Total travel

Nut thickness	Max. torque
1.5 mm	0.5 N.m
2 mm	0.7 N.m
2.5 mm	1 N.m

161V plastic

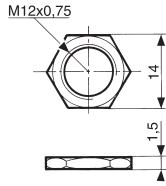


Other shapes and dimensions: consult us

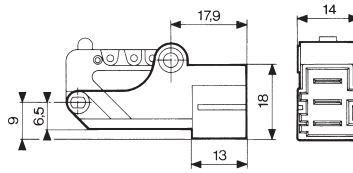
Also available are pinned actuators mounted on position D (factory mounting), same as for 83160 series. (datasheet: SP9640)

Mounting accessories

Nut for 161L



Housing 161J for connections W3 R5



Actuators and mounting accessories

Part numbers for standard actuators	79215740	70507524	79215742	70507529	70507528
Actuators	Flat 161A R14.2	Flat 161A R25.4	Roller 161E R13.6	Roller 161E R24.1	Dummy roller 161F R22.2
Fixing positions	A B	A B C	A B	A B C	A B
Coefficient	2 1	4 2 1.5	2 1	4 2 1.5	3.6 1.8
Operating position (mm)	15.2 ±1 15.2 ±0.45	15.2 ±2.5 15.2 ±1 15.2 ±0.8	20.5 ±1.5 20.5 ±0.8	20.5 ±2.9 20.5 ±1.5 20.5 ±1.2	20.4 ±2 20.4 ±0.7

Part numbers for standard actuators	79218651	79250338	70602118
Actuators	Dummy roller 161G R21,8	**Telescopic plunger 161L	Manual actuation Plastic 161V Housing 161J Nut for 161L
Fixing positions	A B C	D	D
Coefficient	3 1.8 1.2	1	1
Operating position (mm)	21.7 ±2 21.7 ±0.7 21.7 ±0.5	21.5 ±1	18.55 ±0.45

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

** For 831618, 831618 SP4174. Mounted in factory (supplied without nut)

V3 Dual-current - 83161 microswitches with referenced actuators

Actuators	161A R14.2 79215740		161A R25.4 70507524			161E R13.6 79215742		161E R24.1 70507529			161L
	Pos A	Pos B	Pos A	Pos B	Pos C	Pos A	Pos B	Pos A	Pos B	Pos C	Pos D
	831618 I W2 STD UL	83161838 ●	83161839 ●	83161840 ●	83161841 ●	83161842 ●	83161843 ●	83161844 ●	83161845 ●	83161846 ●	83161847 ●
I W3 STD UL	83161850 ●	83161851 ●	83161852 ●	83161853 ●	83161854 ●	83161855 ●	83161856 ●	83161857 ●	83161858 ●	83161859 ●	83161820 ●
I W6A5 STD UL	83161862 ●	83161863 ●	83161864 ●	83161865 ●	83161866 ●	83161867 ●	83161824 ●	83161868 ●	83161869 ●	83161870 ●	●

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* + Mounting accessories*
* if needed

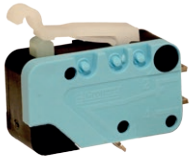
Example: 831618 C W6A5 UL 161L SP9680 + 70602118

Standard product

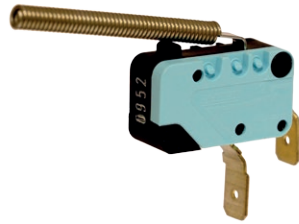
Product made to order

● Contact us

Examples of special adaptations



Plastic lever with no play in rest position



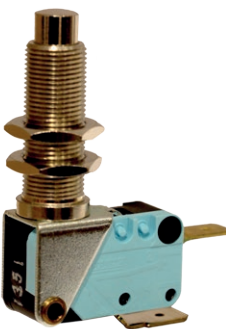
Spring lever for extra-long overtravel



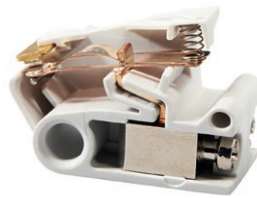
One-way roller lever (active on right, idle-return on left)



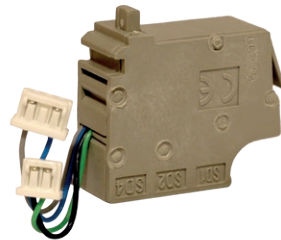
Angled W3 terminals



Telescopic plunger and adjustable fixing. 4mm overtravel.
Metal version for heavy duty. Long barrel.



Fully specific integrable switching module with terminal block for time switch



Auxiliary contact for power switches and circuit breakers. Integrates the V3 - 83161 mechanism



Door switch for industrial vehicle

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