Crouzet

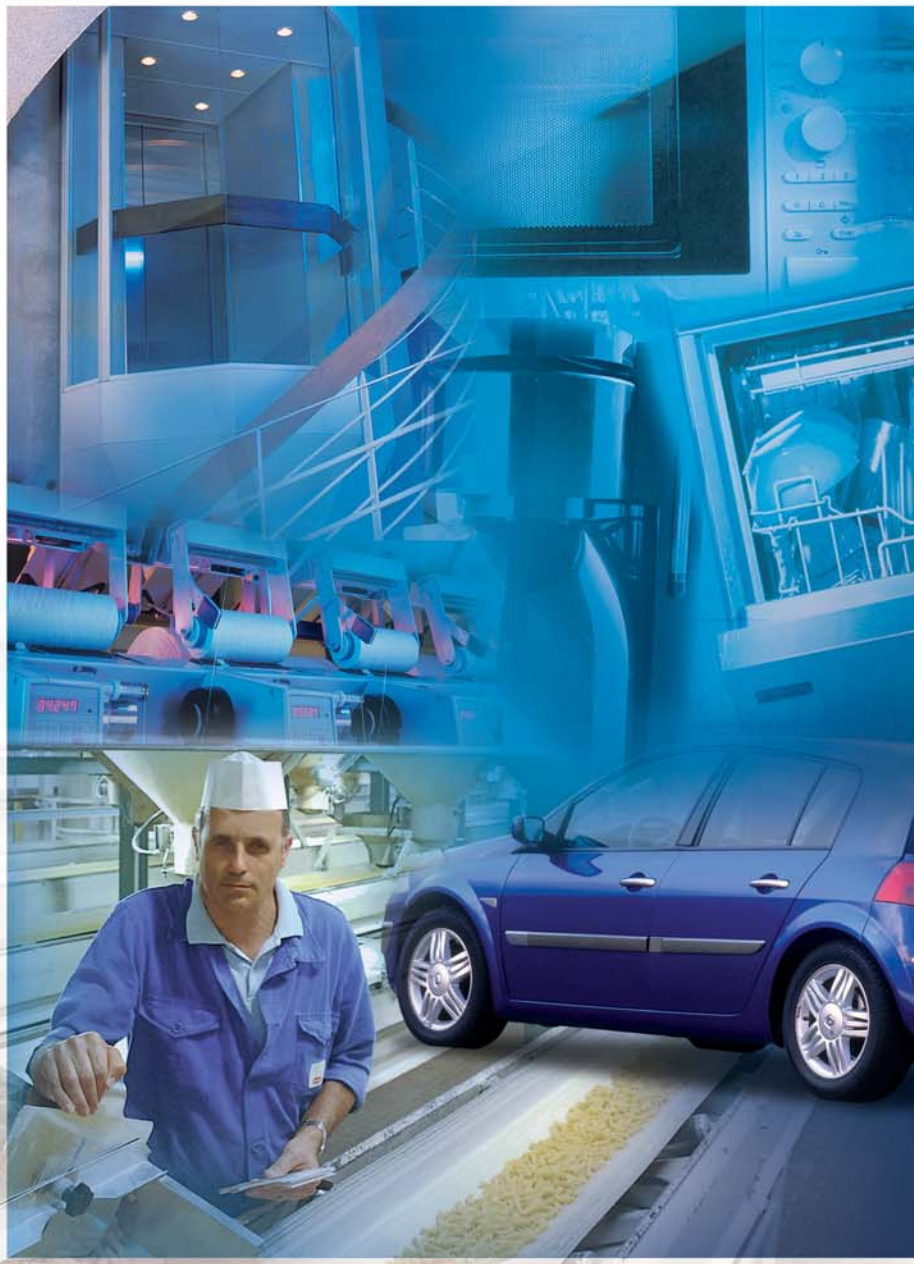
Position sensors

Microswitches
Limit switches

09
Catalogue

Microswitches

Limit switches



CST
CUSTOM SENSORS & TECHNOLOGIES

Crouzet on the Web...

Discover the new Crouzet website at the address below:

http://www.crouzet.com

Crouzet also invites you to browse through the complete offer in the form of electronic catalogues:

http://www.crouzet.com/catalogue_web/int/ENG/accueil_ENG.htm

To meet your maintenance requirements, Crouzet offers you the Senior products site which lists a selection of products that no longer feature in our catalogues:

http://www.crouzet.com/OLC

This site will help you find the main technical characteristics of these products.

And of course, your Crouzet contact will gladly provide you with further information, or suggest the best alternative solution.

Position sensors

Microswitches
Limit switches
Etc

Microcontrol

Timers
Logic controllers
Control relays
Etc

Micro-motors

DC motors
Brushless motors
Synchronous motors
Etc

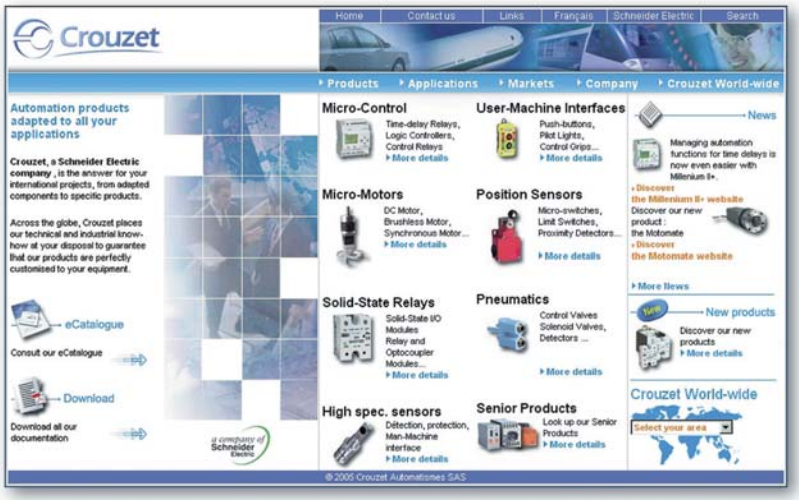
Solid state relays

Solid state modules
Relay and opto-isolator modules
Etc

Pneumatic control

Valve modules
Solenoid valves
Detectors
Etc

www.crouzet.com



Crouzet

Position sensors

Microswitches

Limit switches

Applications

Crouzet: Providing solutions for your applications...

For more than 30 years Crouzet has been assisting its customers in the design and installation of automation products to meet all their equipment needs, whatever their business sector.

From adapted components to special products, Crouzet offers a specialist approach to meet your requirements.

Crouzet provides it customers across the globe with technical and industrial expertise to ensure that our solutions are perfectly integrated into your applications.

Agriculture

Special microswitches

• This series of sealed V4 microswitches mounted and wired on a connection bar detects the position of greenhouse ventilators.

Automotive industry

Sealed microswitch

• A microswitch directly linked to the in-car computer is used to determine the volume of the airbag according to the driver's build.

Industrial vehicle

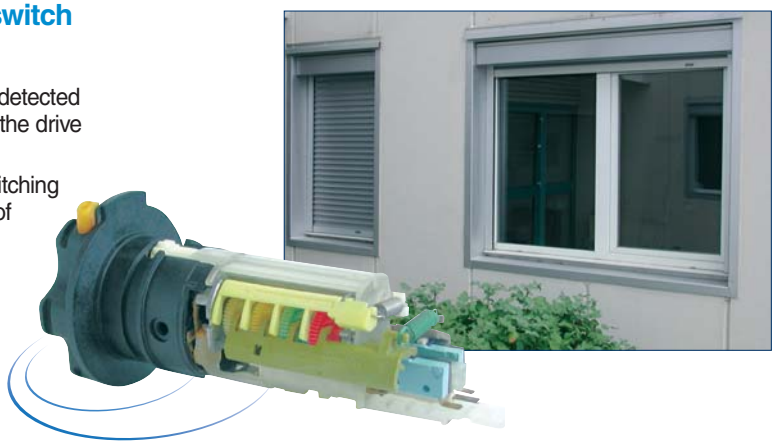
Adapted microswitch

• Mounting this directly on the pedal assembly saves space and simplifies installation thanks to a clearance compensation system.

Building management

Microswitch with high switch rating

- Upper and lower positions are detected via a reduction unit integrated in the drive motor.
- High inductive current (3 A) switching is combined with a high degree of electrical endurance.



Onboard equipment

Microswitch for a specific environment

- This sealed stainless steel component with a long driving stroke is vibration-resistant.

Cement works

Position detection

- Dust and dirt are pushed to the outside thanks to the wiper seal mounted on the control plunger.
- The reliability and service life of the detection system are significantly increased.

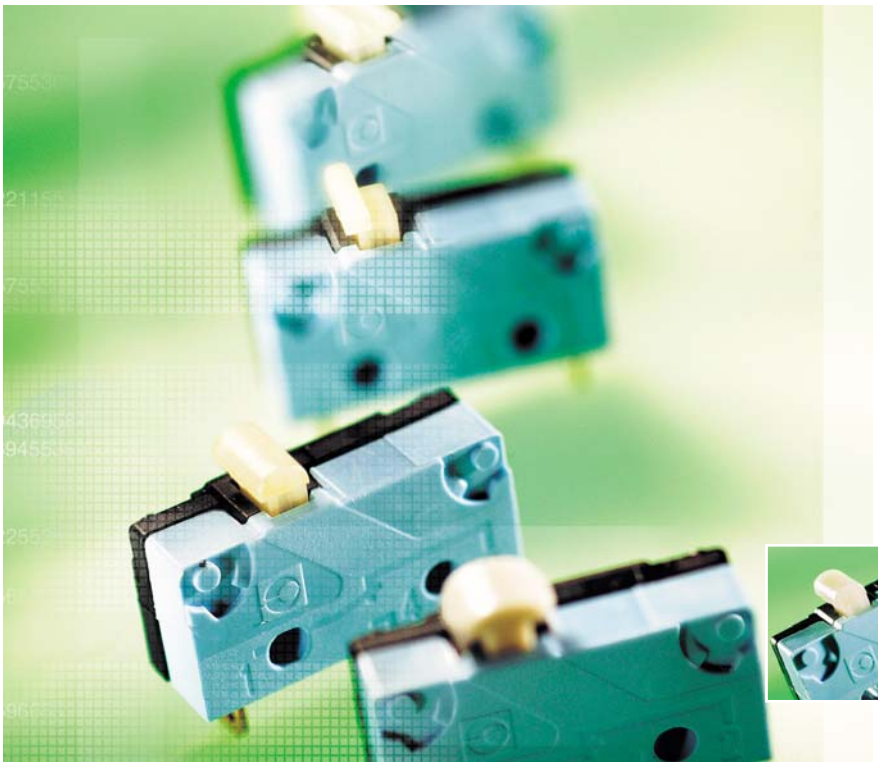
Customisation

Crouzet: Customisation is our business...

To meet the growing demand for customisation, Crouzet's expertise in terms of adapting products and their corresponding accessories is available to all customers.

Crouzet can customise its products for use in any type of environment or application to ensure perfect integration into any equipment.

Control devices

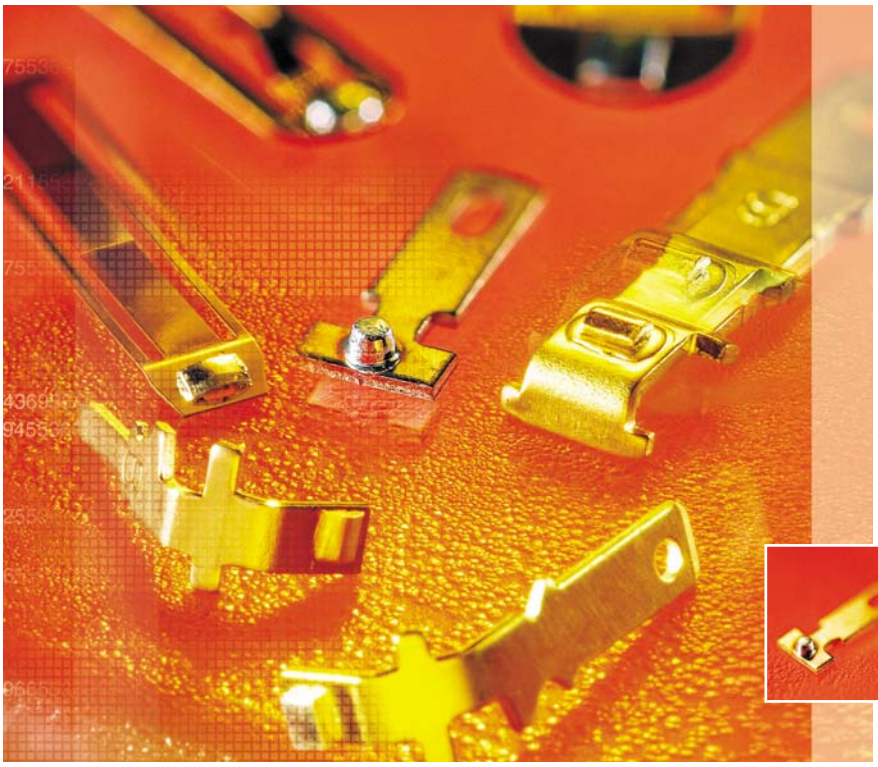


Even more adaptation for easier final mounting

Crouzet has developed considerable expertise in providing special button shapes which compensate for any faults or positioning drift of the control actuator.

Doing away with the need for a lever, and thus an additional accessory, minimises the cost of the function.

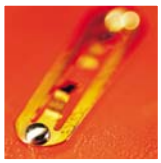
Special contacts



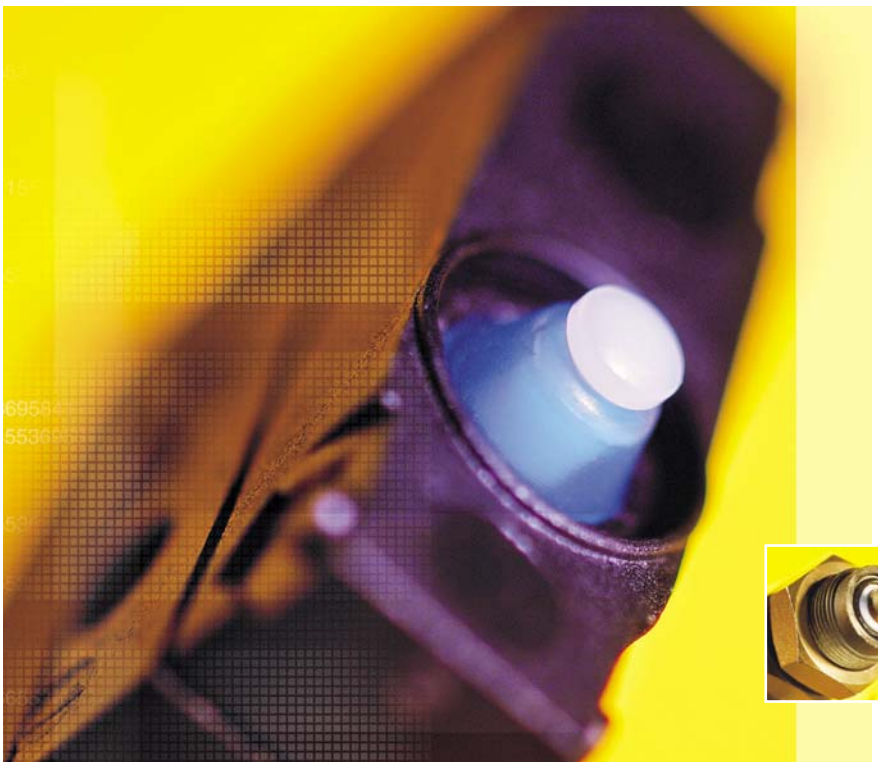
The right contact for every environment

It is essential to know the operating environment for your equipment: high or low current, AC or DC, type of load (inductive or resistive), industrial or corrosive atmosphere, occasional or intensive use. We advocate the use of the best metals, such as silver, silver nickel, silver palladium, gold-plated silver, solid gold.

Crouzet guarantees the operation of its products in all types of environment.



Seals

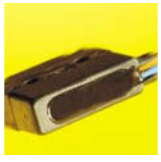


Even more solutions for demanding environments

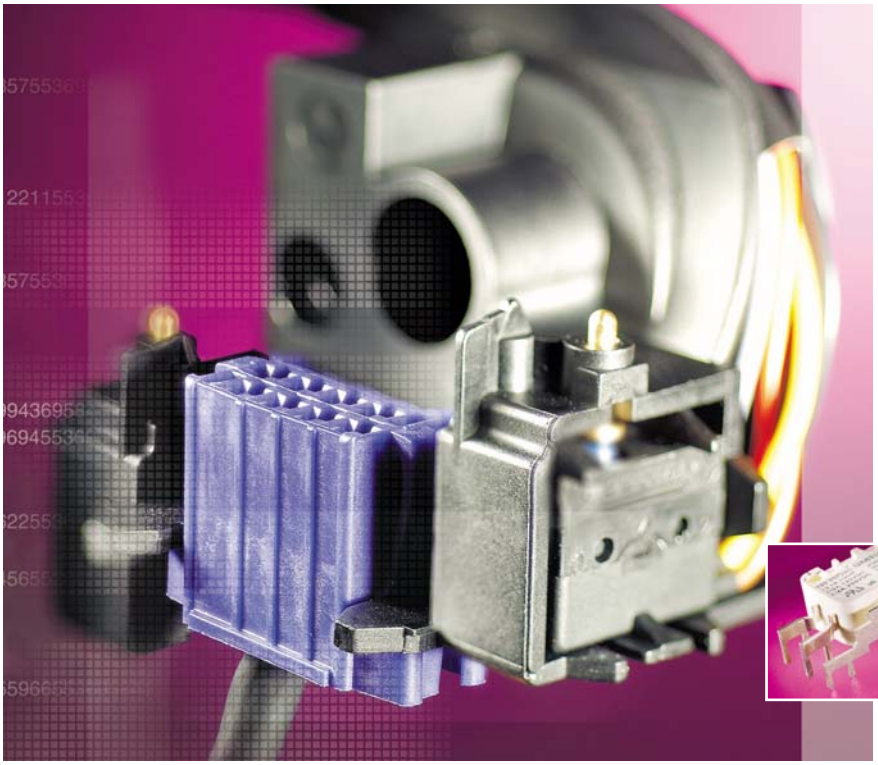
Humid, dusty, gas-filled or corrosive atmospheres affect the reliability of your equipment.

There are numerous components available to provide effective protection for your contacts, including caps, boot seals, membranes, sealing resin, wiper seals.

Crouzet customises its products to ensure your installations operate correctly.



Connections

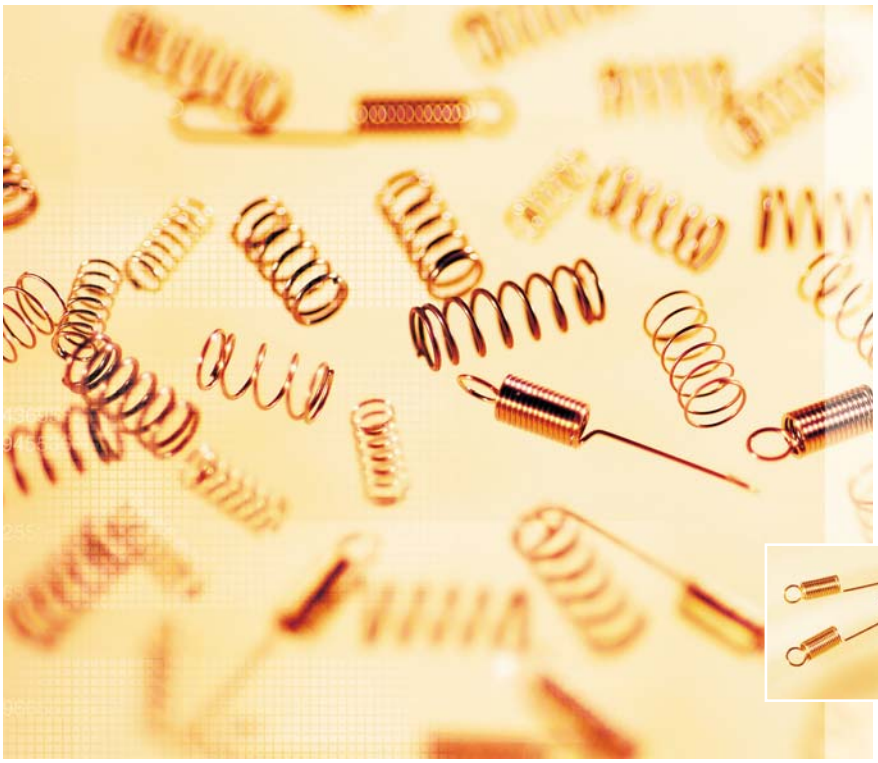


A complete electrical function

Special connectors, customised wiring, customer bundles, dedicated terminals… **Crouzet delivers a complete electrical function.**

You will benefit from shorter lead times and optimised function costs.

Control springs



The right force for each rating

The behaviour of a microswitch must match its application: the outward travel force (0.15 N to 5 N) may be different from the return force.

Mastery of these technical parameters is the guarantee of continuing accuracy and reliability over time.

Special fixings

No effort is spared to make mounting easier

Mounting your product easily in its environment is an everyday challenge for the Crouzet teams.

Snap-on fixing, screw-fixing, crimping or pins are just a few examples of the numerous solutions available to meet all your requirements.

Special levers

Obtain the control data

Angled, curved, extended or retractable... these special lever types can be used to extend the control device for easier adjustment, increase the operating force, resist high actuation torque or provide totally safe electrical isolation.

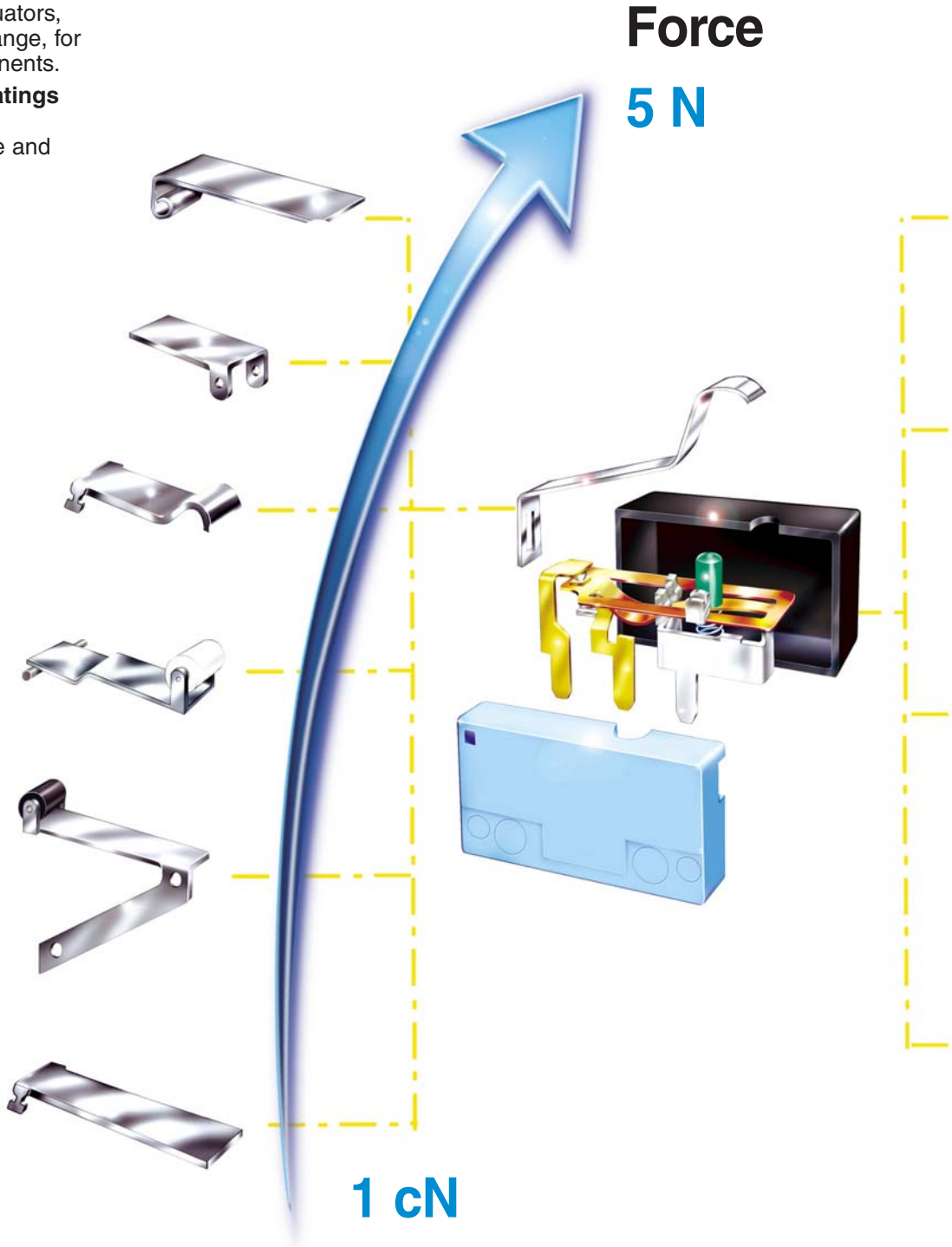
Crouzet's wealth of experience makes designing and debugging your application much easier.

Adaptation

Crouzet: Customised combinations of adaptations...

Crouzet offers a variety of actuators, with a wide **actuation force** range, for combination with basic components.

Crouzet can supply **various ratings** for its range of microswitches, depending on the type, volume and shape of the contact.

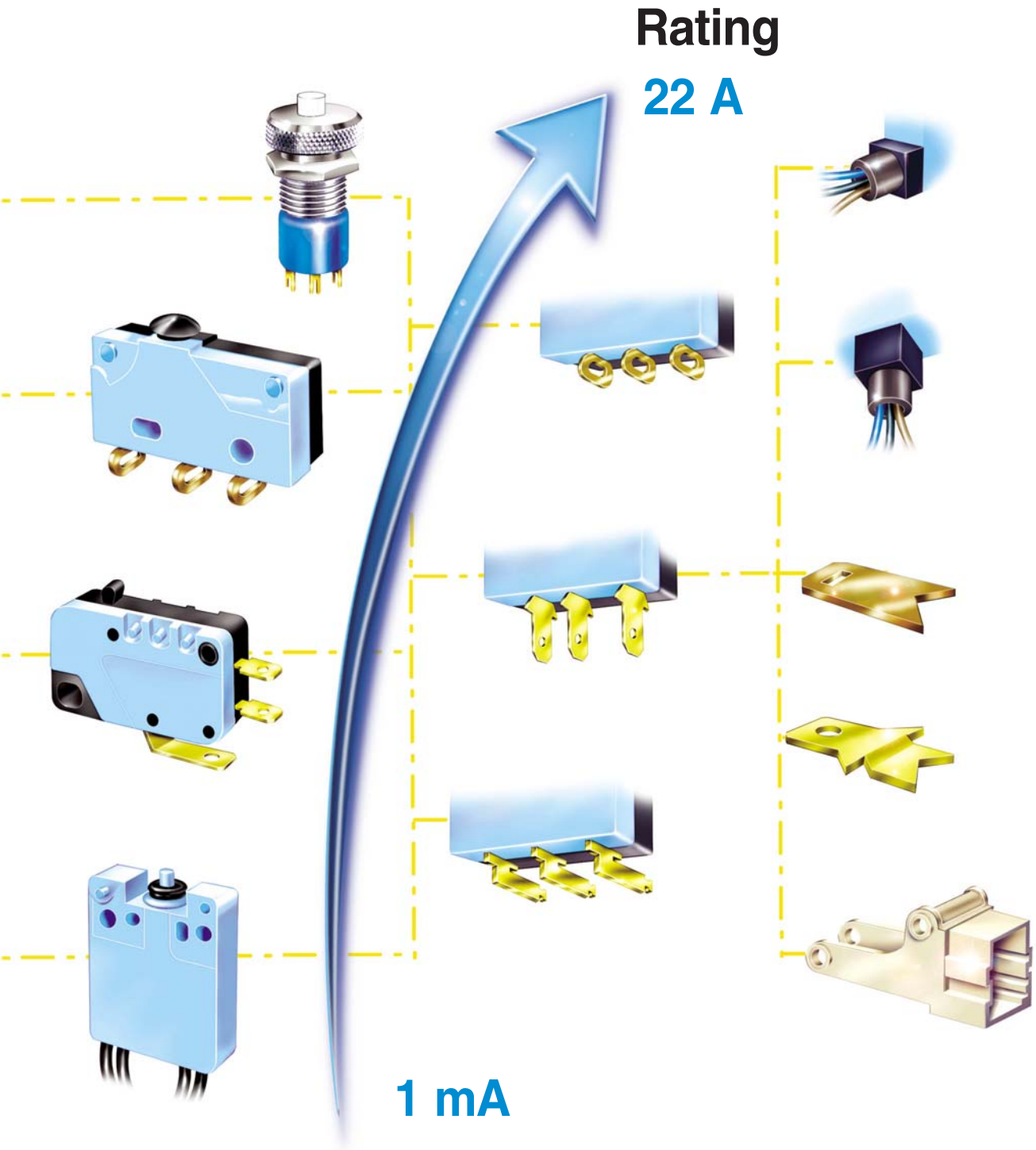


A range of levers:

- ➜ Flat
- ➜ Roller
- ➜ Shaped
- ➜ Flexible
- ➜ With idle-return roller
- ➜ Curved

Types of covers:

- ➜ Standard V3, V4
- ➜ For front panels
- ➜ For flush mounting
- ➜ For special environments



Possible connections:

➜ With standard or special-purpose clips
➜ With standard or customised wire/cable
➜ With special connectors

How to **order**

Standard products

Specify the part number, in black.

Standard products, non stocked

Specify the type and the additional characteristics below.

MICROSWITCHES	Sub-subminiature	Subminiature	Miniature	Protected	Sealed
Type	✔	✔	✔	✔	✔
Function		✔	✔	✔	✔
Connection		✔	✔	✔	✔
Actuators	✔	✔	✔	✔	✔
Anchor position	✔	✔	✔	✔	✔
Accessories				✔	✔
Fixing					✔

LIMIT SWITCHES	Standardised according to EN 50047	Standardised according to EN 50041	Limit switch	Compact according to NFC 63145	For severe environments	Precision	Miniature	Safety
Type	✔	✔	✔	✔	✔	✔	✔	✔
Function					✔			
Connections					✔			
Accessories		✔					✔	

Customisable products

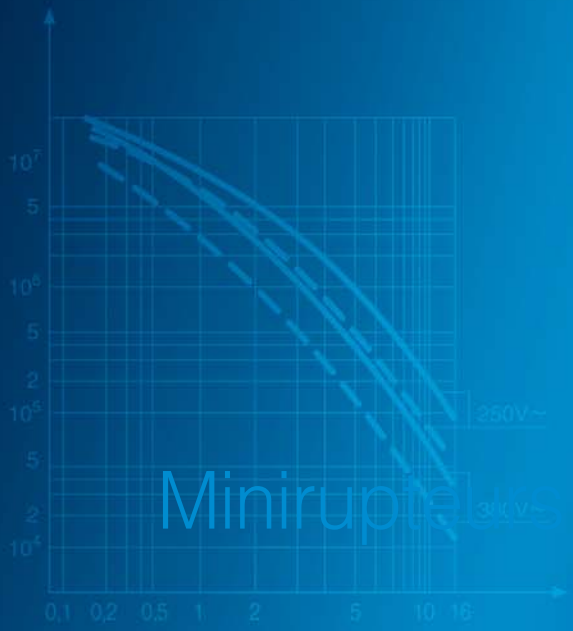
This symbol indicates that the product can be adapted to your requirements. Please contact us to discuss your applications.

Warning:

The product information contained in this catalogue is given purely as information and does not constitute a representation, warranty or any form of contractual commitment. CROUZET Automatismes and its subsidiaries reserve the right to modify their products without notice. It is essential to contact us for any special use/application of our products, and it is the responsibility of the purchaser to check, in particular using all appropriate tests, that the product used is suitable for the application. Our guarantee may under no circumstances be invoked, nor our responsibility sought for any application of our products such as, amongst others, modification, addition, use in combination with other electrical or electronic components, circuits or mounting systems, or any other inappropriate equipment or substance which has not been expressly approved by us prior to the finalisation of the sale.

Microswitches

Microswitches



Miniruptel

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Microswitch Selection Guide

	Nominal current rating	max. operating force (N)	max. differential travel (mm)	mechanical durability (cycles)
Sub-subminiature microswitches				
 p.22				
83 228 83 229	5 A at 250 V AC	1,7	0,13	2×10^6
 p.24				
83 141	1 A at 250 V AC	2	0,1	10^5
Subminiature microswitches				
 p.26				
83 132	5 A at 250 V AC	1,6	0,45	10^7
 p.26				
83 133	5 A at 250 V AC	1,6	0,45	10^7
 p.26				
83 134	5 A at 250 V AC	1,6	0,45	10^7
 p.30				
V4	10 A at 250 V AC 5 A 0,1 A	1,5 0,6 1,5 / 0,6	0,15	10^7 3×10^7 $10^6 / 3 \times 10^7$
 p.34				
V4 Mushroom-head button	10 A at 250 V AC 5 A 0,1 A	1,5 0,6 1,5 / 0,6	0,15	10^6
Miniature microswitches				
 p.38				
V3	20 A at 250 V AC 16 A 10 A	1 3 / 0,8 0,5	0,35	$2,5 \times 10^6$ $10^7 / 2 \times 10^7$ 3×10^7
 p.44				
V3 Dual-current	0,1 A at 250 V AC	0,8 / 0,25 / 0,15	0,35	$2 \times 10^7 / 5 \times 10^7$
 p.48				
83 160	16 A at 250 V AC 10 A 6 A	4 / 5 2 1	0,3 / 0,7 0,4 0,35	$10^7 / 10^6$ 10^7 10^7
 p.52				
83 160 7A+	6 A at 250 V AC	4	-	10^7
 p.56				
83 137 rotary action	5 A at 250 V AC	0,12 N cm (operating torque max.)	14	10^7

Microswitch Selection Guide

		Nominal current rating		max. operating force (N)	max. differential travel (mm)	mechanical durability (cycles)
Protected microswitches						
	p.58					
	83 106	5 A	at 250 V AC	4 / 0,45 / 2	0,5	10^7 / 10^6
	p.62					
	83 109	5 A	at 250 V AC	4	0,5	10^7
	p.66					
	83 112	5 A	at 250 V AC	4	0,5	10^7
	p.70					
	83 111	5 A	at 250 V AC	4	0,5	10^7
	p.74					
	83 154	5 A	at 250 V AC	4	0,65	10^7
	p.78					
	83 118	5 A	at 250 V AC	2,7	0,09	5 x 10^7
Waterproof microswitches						
	p.82					
	83 139	6 A	at 250 V AC	3 / 0,25	0,35	10^7 / 5 x 10^7 / 0,6
	p.86					
	V3	8 A 5 A 0,1 A	at 250 V AC	4,5	0,35 / 0,07	5 x 10^6
	p.90					
	83 123	5 A	at 250 V AC	7,5	0,2	2 x 10^6
	p.92					
	V4	10 A 6 A 3 A	at 250 V AC	3,4 2,5 2,5	0,1	10^6 2 x 10^6 2 x 10^6

Basic technical concepts

These basic principles apply to all our precision switches. The specific characteristics of each model are given in more detail in the relevant product sections.

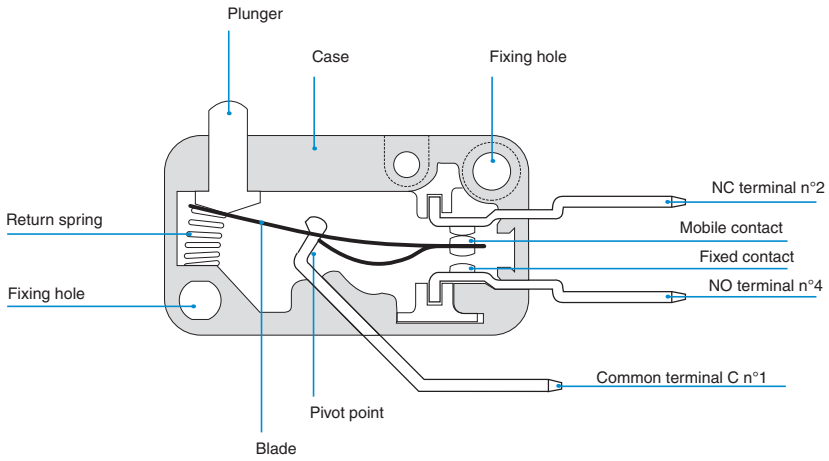
Introduction

Our microswitches are high-precision, snap-action microswitches and these are the main features for which they are notable :

- High ratings but small dimensions
- Very short travel
- Low operating force
- High reliability of travel and force values
- Long life
- Large range of actuators for easy adaptation to the most varied applications

Microswitch construction

➜ Single-pole changeover microswitch (e.g. "V3" 83 161)

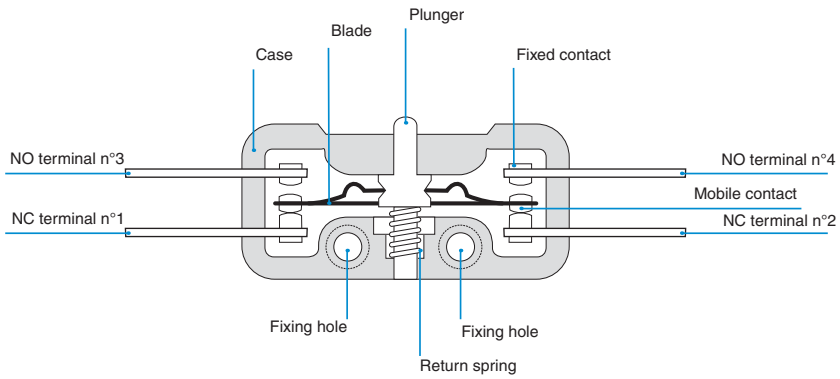


Electrical function
Changeover

Normally closed

Normally open

➜ Double-pole changeover microswitch (e.g. 83 132 0)



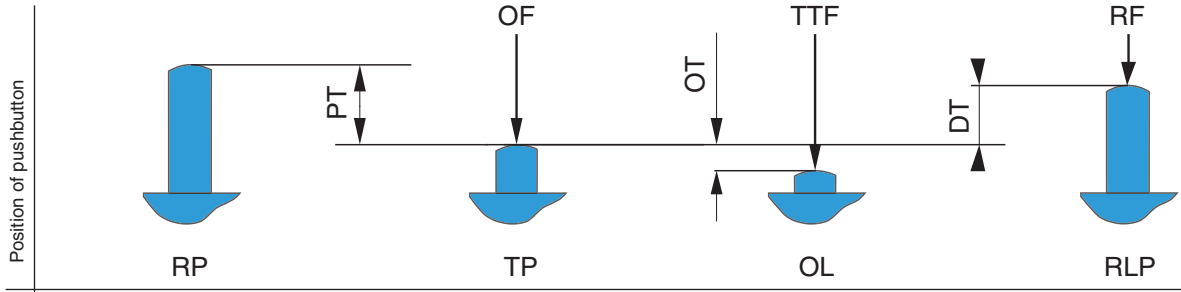
Electrical function
Changeover

Normally closed

Normally open

The NO and NC circuits must both be of the same polarity.

→ Terminology - Forces - Positions - Travel



Forces

	OF Operating Force	TTF Total travel force	RF Release force
	Minimum operating force which must be applied to the operating device to displace the rest position RP to the tripping point TP.	Force required to displace the operating device from its rest position RP to its overtravel limit position (we only specify this value if it is higher than the operating force. When not quoted, it is equal to or less than the operating force). **MOF Maximum overtravel force** The maximum force which can be applied to the operating device, without damaging it, in the end of travel position where it is in abutment internally or against the face of the case.	Force to which the operating force must be reduced to allow the snap-action mechanism to return to its release position RLP.

Positions

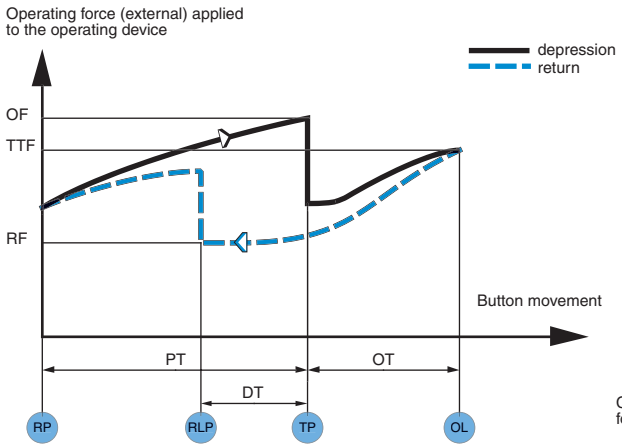
RP Rest position	TP Tripping point	OL Overtravel limit	RP Release position
Position of the operating device when no external mechanical force is applied. Also described as «height at rest».	Position of the operating device relative to the fixing point (hole, face) at the moment when the microswitch trips.	Position of the operating device when an extreme force has moved it to the effective end of the available travel.	Moment when the snap-action mechanism trips on its return to its original position.

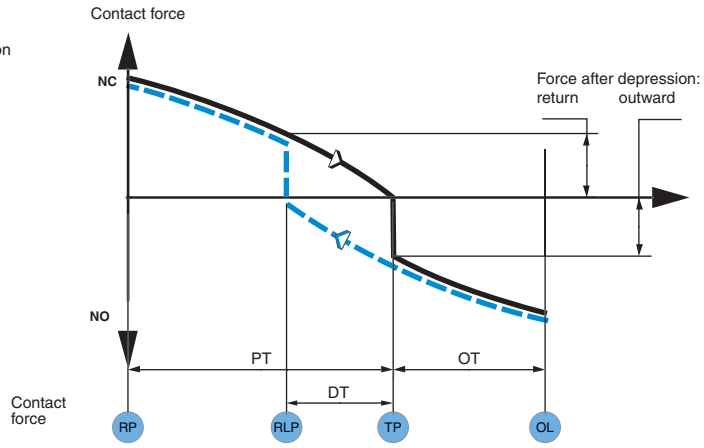
Travel

	PT Pre-travel	OT Overtravel	DT Differential travel
	Distance between the rest position RP and the tripping point TP.	Distance between the tripping point TP and the overtravel limit OL.	Distance between the tripping point TP and the release position RLP.

The reference point for the figures given for travel and forces is a point F situated on the plunger in the case of a plain microswitch, or, generally, 3 mm in from the end of a plain lever.
The reference point for the positions is one of the fixing holes, unless otherwise indicated.

→ Graphs of forces vs. travel

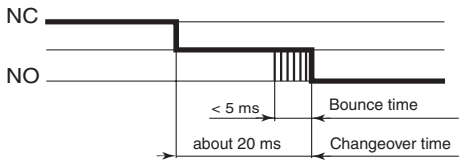




Mechanical characteristics

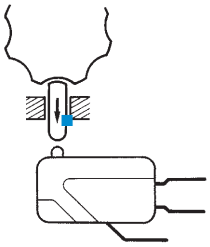
➜ Changeover time

This is the time taken by the mobile contact when moving from one fixed contact to another until it becomes fully stable (contact bounce included). This time is a function of the contact gap, the mechanical characteristics of the snap action and the mass of the mobile element.
However, thanks to the snap-action mechanisms employed, the time is largely independent of the speed of operation.
It is normally less that 20 milliseconds (including bounce times where less than 5 ms).



➜ Mechanical durability

This is an average value indicating the purely mechanical performance of a microswitch when not subject to any electrical load.
It may be useful for evaluation purposes in cases where the power levels involved are very low and the electrical life is thus close to the mechanical life.

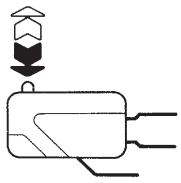


➜ Maximum speed and rate of operation

Our microswitches will work at speeds of operation varying over a very wide range : normally from 1 mm/min to 1 ms.
The maximum rate of operation with a low electrical load may be as high as 10 operations/second.

➜ Mounting - Operation

• To conform to the leakage paths and air gaps in the standard EEC24 - EN/IEC 61058 - EN/IEC 60947:



■ An insulation pad must be inserted between the microswitch and the fixing surface if the latter is metal.
■ Manual operation of a metal actuator must only be carried out with the help of a secondary actuator made of insulating materials.
The installer must ensure adequate protection against direct contact with the output terminals.

➜ Fixing - Screw torque

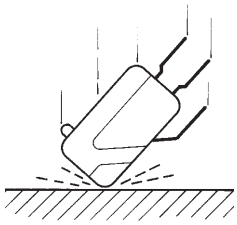
• Unless otherwise indicated in the mechanical characteristics table, the torque required for the fixing screws must conform to the following values :

Ø of fixing screw		2	2.5	3	3.5	4
Screw torque in cm.N	maximum	25	35	60	100	150
	minimum	15	25	40	60	100

Environmental conditions

➜ Resistance to shocks and vibrations

Resistance to impact and vibration depends on the mass of the moving parts and on the forces holding the contacts together.
Generally speaking, for a microswitch without an actuator :
■ Vibration >10 G 10 at 500 Hz
■ Impact > 50 G 11 ms 1/2 sine
Further information on request.



➜ Ambient operating temperature

The maximum and minimum temperatures at which the mechanical and electrical characteristics of the microswitch will remain substantially unaltered.

➜ Degree of protection

Under the IEC 529 or NFC 20010 classification scheme, standards employ an IP code to define the degree or class of protection which electrical equipment provides against access to live components, the entry of solid foreign bodies and ingress of water.

1st numeral		
Protection equipment provides against the entry of solid foreign bodies		Protection for persons against access to dangerous parts
0	(not protected)	(not protected)
4	diameter ≥ 1 mm	1 mm Ø wire
5	protected against dust	1 mm Ø wire
6	sealed against dust	1 mm Ø wire

2nd numeral	
Protection equipment provides against ingress of water	
0	(not protected)
4	splashed water
5	hosed water
6	high-pressure hosed water
7	temporary immersion
8	prolonged immersion

Under this classification, our microswitches come within the following categories :
■ Plain microswitches = IP 00
■ Protected microswitches = IP 40 with isolated connection
■ Sealed microswitches = IP 66 or IP 67

Dielectric characteristics

➜ Current rating

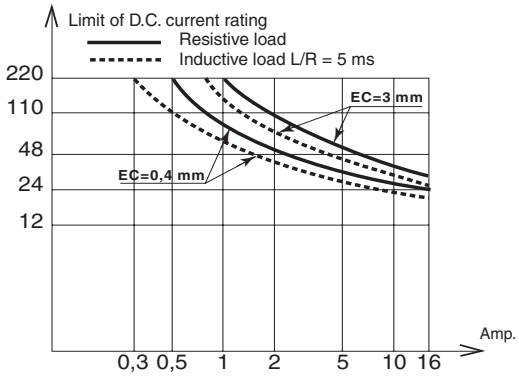
This is the current the microswitch is capable of making and breaking, which forms the basis for the life tests.

➜ Thermal rating

This is the current the microswitch will withstand when not being operated, for a temperature rise of not more than 60°C.

➜ Switch rating

AC voltages : see the current rating
With DC voltages the switch rating is very much dependent on the voltage, the contact gap and the nature of the load being switched. There is a risk of prolonged or indeed permanent arcing if the following limits are exceeded :

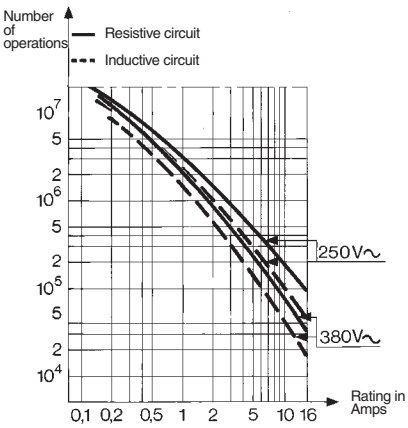


For special applications, please consult us.

➜ Operating curves

These indicate the electrical life of the microswitches, under standard conditions (20°C, 1 cycle/2 seconds), by showing the number of switching operations which can be performed with given types of load.

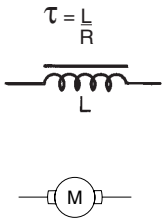
Note : for sealed products and D.C. ratings, the operating rate is 1 cycle/6 seconds.



Circuit types

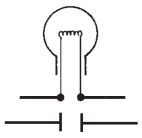
➜ Resistive circuit

For a circuit with alternating voltage, this is in phase with the current : Cos φ = 1.



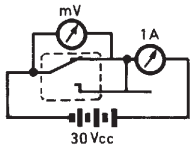
➜ Inductive circuit

A circuit of this type with direct current is characterised by a time constant.
An inductive circuit, with alternating voltage, for example, incorporating a motor (cos φ < 1) can cause current surges up to 6 times the nominal current. For certain switches, we give electrical endurance curves with $\frac{L}{R}$ = 5 ms in DC and cos φ = 0.8 in AC.



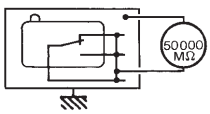
➜ Lamp and capacitance circuit

In this case, currents at the closing of the circuit have high value, up to 10 times the normal rating.



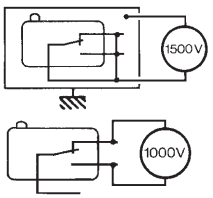
➜ Internal resistance

This consists of the intrinsic resistance (fixed) of the parts carrying current and the contact resistance (variable).
Close to the tripping point and release position, the force holding the contacts together drops considerably and this may cause a significant rise in internal resistance.



➜ Insulation resistance

The insulation resistance of the microswitches is generally greater than 50 000 MΩ measured at 500 V DC.



➜ Dielectric strength

The dielectric strength of our microswitches is generally better than :

- 1500 volts between live parts and earth
- 1000 volts between contacts
- 600 volts between contacts for microswitches whose contact gap is less than 0.3 mm.

Contact materials

➜ Choice of contact material

To choose the best material for the contacts there are various factors to be considered :

- the current and voltage levels
- the type of load
- the number of operations
- the switching frequency
- the environmental conditions

➜ Contacts for general-purpose use

Our microswitches are normally fitted with silver contacts. These are suitable for the majority of applications and provide the best compromise between electrical performance, thermal performance and life.

➜ Contacts for low-power circuits

U < 10 V and/or I < 100 mA

The contacts used in this case are plated with gold (or a gold alloy) for good reliability even in corrosive atmospheres.

➜ Contacts for special applications

We can supply special contacts suitable for particular applications, such as :

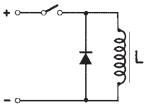
- Ag CdO contacts for very high drawn currents
- Cross gold-plated Ag Ni contacts which allow a very wide range of applications to be covered by a single type of microswitch.

Electrical recommendations

➜ Inductive circuits

To increase the life of contacts and their DC rating, arcing on opening can be reduced by using the following circuits :

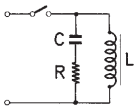
A



- for DC

A - Fast diode V R > 5 x V nominal
I nominal > 10 x I winding

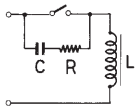
B



- for DC or AC

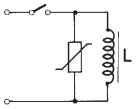
B - RC circuit across inductance
C - RC circuit across microswitch

C



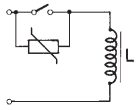
C (nF) ~ 100 x I nominal (A)
V insulation > V peak
R (Ω) ~ load resistance (Ω)

D



D - Varistor circuit across load
E - Varistor circuit across microswitch
V > V peak supply

E



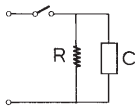
$$E\ (J) \geq \frac{P\ (V.A)}{100}$$

➜ Very low-power circuits

In very low-power circuits (I > 1 mA, V ≤ 5 V), switching is highly sensitive (to the atmosphere, pollution).

If the supply is powerful enough, adding a passive resistor to increase the current broken by the microswitch to a few milliamps will substantially improve reliability of operation.

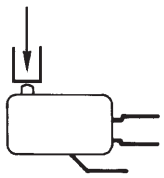
R - Load resistance
C - Very low current load



Methods of actuation

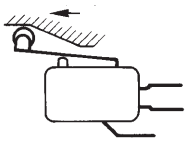
➜ Methods of actuation

Force should preferably be applied to the device to be directly operated - the plunger - along its axis. However, the majority of our microswitches will accept skewed operation provided the angle of application is not more than 45°.

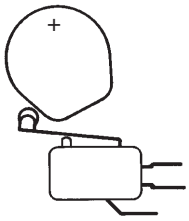


The device used to apply the force must never hamper the travel of the plunger to the tripping point (TP). It must under all circumstances move the plunger through at least 0.5 times the over-travel (OT) quoted. Steps must also be taken to see that it does not cause the OL or MOF quoted to be overrun or exceeded.

➜ Operation by actuator



When operation is by a roller lever, force should preferably be applied in the direction shown on the left.



Where the movements involved are fast, the ramp should be so designed as to ensure that the operating device is not subjected to any violent impact or abrupt release.

Quality

Crouzet undertakes a pro-active quality policy adapted to our different markets of which the objectives are:

- To actively contribute to the success to our clients
- To ensure the perennial development of the company and the brand by achieving global performance (social, economic, product and service offer) in the field of environment and legislation.

➜ This quality implies:

- Mobilisation and dynamic behaviour by the entire staff
- Achieving results and respecting our commitments
- Sharing our policies with our partners (clients, suppliers…)

➜ This quality is based on a series of ongoing actions:

- Focusing on the preventative
  - Quality starts from the understanding of the clients needs in order to work out the specifications where Crouzet acts as expert advisor.
  - Quality is pro-active in actions for progress
  - Quality ensures the systematic exploitation of feedback experience, methods and quality tools.

Standards - Approvals

Our microswitches are designed according to international recommendations (IEC), American standards (UL) and/or European standards (EN).

Proof of compliance with these standards and recommendations is demonstrated by

- the manufacturer's declaration of conformity (drafted in accordance with the ISO/IEC 22 guidelines), or
- approval granted directly by an accredited body, or by application of the CCA (Cenelec Certification Agreement).

More detailed information on the approval for a particular type of microswitch can be obtained on request.

Rules and regulations

➜ EC directives

Our microswitches are compatible with European Community technical directive (Low
Voltage) 73/23 and can be used within the framework of Machinery directive 83/392.

➜ Environmental protection ISO 14001

The modern concept of protection of the environment is an integral part of the manufacture of our microswitches, from product design through to packaging.

Sub-subminiatures

➜ 83 228 0 / 83 229 0

- Very compact dimensions
- Flush-mounted or threaded barrel fixing
- Long mechanical life
- Short differential travel
- Operating temperature -55°C to +100°C

Main specifications

		Flush-mounting 83 228 0	Threaded barrel fixing 83 229 0
Function	**Connections**		
I (changeover)	W2 solder	**83 228 0**	**83 229 0**
Electrical characteristics			
Rating nominal / 250 V AC (A)		5	5
Rating thermal / 250 V AC (A)		10	10
Mechanical characteristics			
Maximum operating force (N)		1.7	1.7
Min. Release force (N)		0.4	0.4
Max. permitted overtravel force (N)		4.5	4.5
Maximum rest position (mm)		2.4	7
Tripping point (mm)		$1.95^{\pm 0.25}$	$6.55^{\pm 0.25}$
Differential travel (mm)		$0.13^{\pm 0.06}$	$0.13^{\pm 0.06}$
Min. overtravel (mm)		0.15	0.15
Ambient operating temperature (°C)		-55 → +100	-55 → +100
Mechanical life (operations)		2×10^6	2×10^6
Contact gap (mm)		0.15	0.15
Weight (g)		0.7	1.7
Comments			

This microswitch does not have a physical stop for the operating device and for this reason we advise users not to exceed the permitted overtravel if they wish the product to continue operating with no change to any of its characteristics.

Additional specifications

Components
- Cover : PBT
- Base : PA

Material
- Contacts : gold-plated silver
- Threaded barrel : nickel brass (for 83 229)

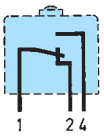
Product adaptations

- Special contacts
- Specific fixing
- Approvals : UL/CSA

To order, see page 12

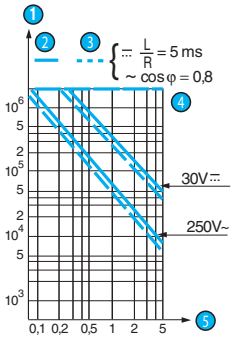
Principles

Single break changeover switch



Curves

Operating curve for types 83 228 0 - 83 229 0



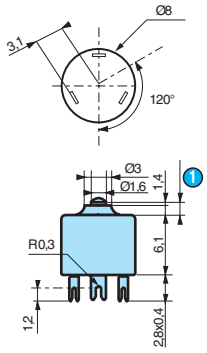
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

These products are designed to operate equally well on dual-current (1 mA 4 V minimum) or medium-current circuits (5 A maximum) circuits. However, a given product should only be used to switch one type of circuit during its working life.

Dimensions

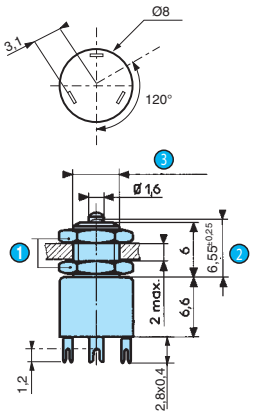
➜ Product

83 228 0



1. Tripping point $1.95^{\pm 0.25}$

83 229 0



1. 2 nuts 7
2. Tripping point
3. M5 x 0.5 pitch

Other information

Mounting - Operation
See basic technical concepts

Sub-subminiatures

➜ 83 141 0

- Very compact dimensions Short differential travel
- Operating temperature -50°C to +125°C
- Choice of actuators and fixing positions

Main specifications

Function	Connections	Plunger-operated 83 141 0
I (changeover)	W2 solder	83 141 0
Electrical characteristics		
Rating nominal / 250 V AC (A)		1
Rating thermal / 250 V AC (A)		8.5
Mechanical characteristics		
Maximum operating force (N)		2
Min. Release force (N)		0.4
Maximum total travel force (N)		2.1
Max. permitted overtravel force (N)		10
Rest position max. (mm)		8.9
Tripping point (mm)		$8.4^{\pm 0.20}$
Differential travel (mm)		0.02 → 0.1
Min. overtravel (mm)		0.1
Ambient operating temperature (°C)		-50 → +125
Mechanical life (operations)		10^5
Contact gap (mm)		0.3
Weight (g)		1

Additional specifications

Components
Material
- Case : glass-filled diallyl-phthalate resin
- Contacts : silver
- Terminals : gold-plated brass

Lever
- stainless steel

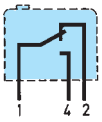
Product adaptations

- Special levers
- Approvals : UL/CSA

To order, see page 12

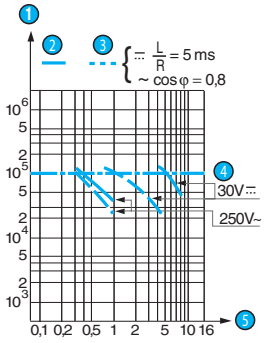
Principles

Single break changeover switch



Curves

Operating curve for type 83 141 0

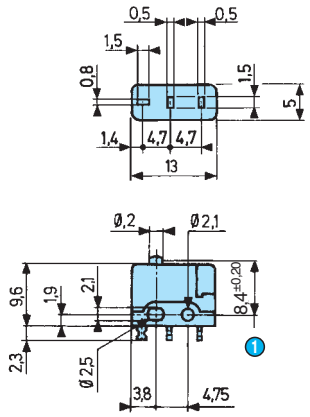


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

➜ Product

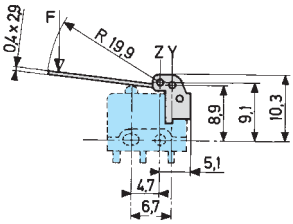
83 141 0



1. Tripping point

➜ Actuators and fixing positions

Lever : mounting position



Standard mounting Z

Straight lever 55B

➜ Actuators

Mounting position table

	Y	Z*
Tripping point	$9,3^{\pm 0,45}$	$9,2^{\pm 0,65}$
Operating force max.	1	0,8
Release force - min.	0,2	0,15
Pre-travel - max.	1,25	1,8
Differential travel	$0,17^{\pm 0,09}$	$0,25^{\pm 0,11}$
Total travel max.	1,6	2,25

* Except where otherwise indicated, the lever is mounted in position Z, which must always be done in our factory.

Other information

Mounting - Operation
See basic technical concepts

Subminiature

➜ 83 132 / 83 133 / 83 134

- Double break switching
- Choice of actuators for symmetrical mounting
- Options for operation in stable positions



Main specifications

		Side outputs 83 132 0	Rear outputs 83 133 0	Output on front face 83 134 0
Function	**Connections**			
I (changeover)	W2	**83 132 030**	**83 133 035**	-
I (changeover)	X1	-	●	●
Electrical characteristics				
Rating nominal / 250 V AC (A)		5	5	5
Rating thermal / 250 V AC (A)		11	11	11
Mechanical characteristics				
Maximum operating force (N)		1.6	1.6	1.6
Min. Release force (N)		0.4	0.4	0.4
Max. permitted overtravel force (N)		10	10	10
Rest position max. (mm)		8.45	8.45	8.10
Tripping point (mm)		$7.7^{\pm 0.2}$	$7.7^{\pm 0.2}$	$7.35^{\pm 0.25}$
Maximum differential travel (mm)		0.45	0.45	0.45
Min. overtravel (mm)		0.27	0.27	0.27
Ambient operating temperature (°C)		-20 → +125	-20 → +125	-20 → +125
Mechanical life (operations)		10^7	10^7	10^7
Contact gap (mm)		0.3 x 2	0.3 x 2	0.3 x 2
Weight (g)		1.8	1.8	1.8

Additional specifications

Components
Material
- Case : glass-filled polyamide
- Contacts : silver
- Cupro-nickel terminals

Lever
- Flat : stainless steel
- Roller : polyamide

Accessories : stainless steel

Product adaptations

- Special levers
- Reinforced spring
- Approvals : UL - cUL

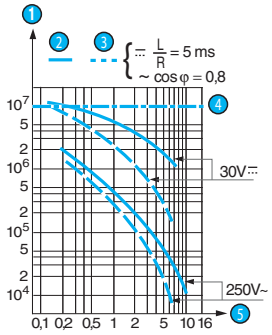
To order, see page 12

Principles

Double break changeover switch

Curves

Operating curve for types
83 132 0 - 83 133 0 - 83 134 0

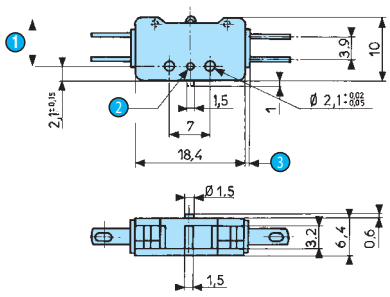


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

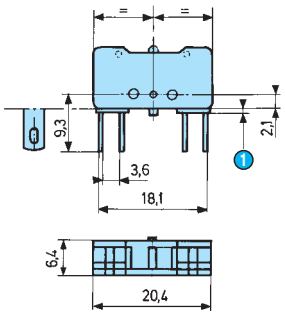
➜ Product

83 132 0



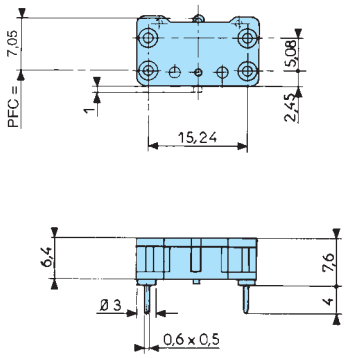
1. OL = 7.4
2. Ø1.5 depth 0.7
3. 2 plates 0.8

83 133 0



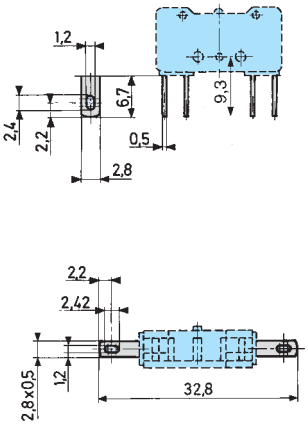
1. 2 plates 0.8

83 134 0

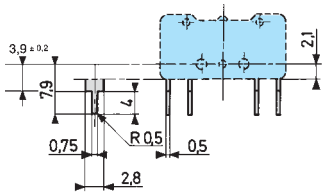


➜ Connections

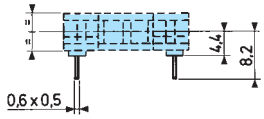
W2 solder (83 132 - 83 133)
tags can accept faston clips 2.8 x 0.5 mm



X1 for printed circuit boards (83 132 - 83 133)

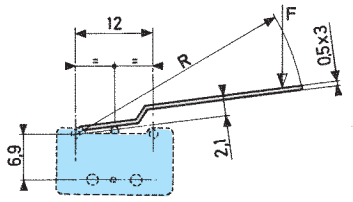


X1 for printed circuit board (83 134)

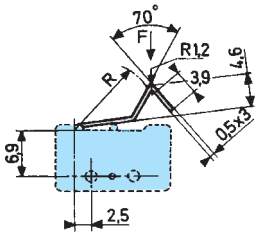


➜ Actuators and fixing positions

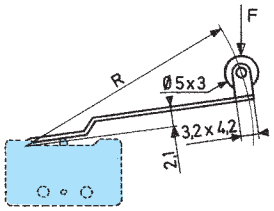
54A



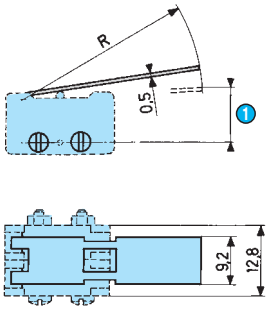
54B



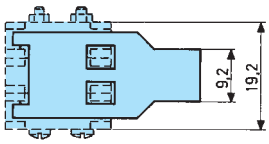
54E



54A2



54A3



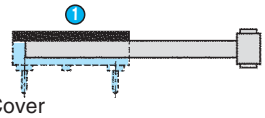
1 Tripping point

➜ Mounting accessories

For 83 132 0 and 83 133 0

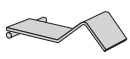
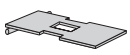
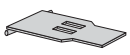
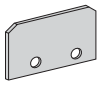
1 Cover

For 83 134 0



1 Cover

Actuators and fixing positions

Part numbers for standard actuators		70 514 175	70 514 194	70 514 181	70 514 182
Actuators		Plain **54A** R14.75	Plain **54A** R35.75	Tip-mounted in-line roller **54E** R7.5	Tip-mounted in-line roller **54E** R14.1
					
		83 132 0	83 132 0	83 132 0	83 132 0
		83 133 0 / 83 134 0	83 133 0 / 83 134 0	83 133 0 / 83 134 0	83 133 0 / 83 134 0
Tripping point		9.5 ±0.8 / 9.2 ±0.8	10 ±1.5 / 9.7 ±0.15	14.2 ±0.3 / 13.9 ±0.3	15.5 ±0.8 / 15.2 ±0.8
Operating force max.	N	0.8	0.34	1.6	0.8
Release force min.	N	0.16	0.06	0.32	0.17
Pre-travel max.	mm	2.15	5.15	1.1	2.05
Differential travel	mm	1 ±0.3	2.1 ±0.65	0.5 ±0.15	0.95 ±0.3
Total travel max.	mm	2.8	6.8	1.45	1.45
Actuators		**54B** R13.17	2-pole **54A2** R30	3-pole **54A3** R30	Side fixing plate (0.4 mm thick) **54Y**
					
		83 132 0	83 132 0	83 132 0	
		83 133 0 / 83 134 0	83 133 0 / 83 134 0	83 133 0 / 83 134 0	
Tripping point		12.7 ±0.8 / 12.4 ±0.8	8.8 ±0.8	8.8 ±0.8	
Operating force max.	N	0.85	0.8	1.2	
Release force min.	N	0.18	0.16	0.24	Always supplied separately
Pre-travel max.	mm	2.05	4.3	4.3	
Differential travel	mm	0.95 ±0.3	2 ±0.55	2 ±0.55	
Total travel max.	mm	2.7	5.75	5.75	

Unless mentioned specifically, the levers are mounted in the position illustrated on the dimension diagrams (standard mounting).
We recommend that these levers are assembled in our workshops.

Other information

Mounting - Operation
See basic technical concepts

Subminiature

→ V4

- **Nominal ratings 0.1 A to 10 A/250 VAC**
- **Minimum rating 1 mA/4 VDC**
- **Operating temperature up to +125°C**
- **Conforming to standards EN 61058 and UL 1054**
- **Choice of actuators with 2 possible fixing positions**

Main specifications

		Standard 83 170 0	Low force 83 170 4	Dual-current 83 170 8	Dual-current low force 83 170 9
Function	**Connections**				
I (changeover)	W2	**83 170 002**	●	**83 170 802**	●
I (changeover)	W7A5	**83 170 005**	●	**83 170 805**	●
I (changeover)	X1	**83 170 008**	●	**83 170 808**	●
I (changeover)	X1S - X2 - X2S - X3 - X3S	●	●	●	●
R (normally closed)	W2 - W7A5	●	●	●	●
C (normally open)	W2 - W7A5	●	●	●	●
Electrical characteristics					
Rating nominal / 250 V AC (A)		10	5	0.1	0.1
Rating thermal / 250 V AC (A)		12.5	6	6	6
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. permitted overtravel force (N)		10	10	10	10
Rest position max. (mm)		9.2	9.2	9.2	9.2
Tripping point (mm)		$8.4^{\pm 0.3}$	$8.4^{\pm 0.3}$	$8.4^{\pm 0.3}$	$8.4^{\pm 0.3}$
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)		-20 → +125	-20 → +125	-20 → +125	-20 → +125
Mechanical life (operations)		10^{7}*	3.10^{7}	10^{6}	3.10^{7}
Contact gap (mm)		0.4	0.4	0.4	0.4
Weight (g)		1.7	1.7	1.7	1.7
Comments					
* For 2/3 of the overtravel					

Additional specifications

Components
Material
- Case : polyester UL 94 VO
- Button : Glass-filled polyamide
- Contacts : AgNi, gold-plated AgNi (dual-current)
- Terminals : cupro-nickel (except W7A5 in brass)

Levers
- Flat : stainless steel
- Roller : stainless steel, polyamide roller

Approvals
NF - UL - cUL

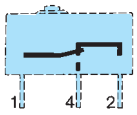
Product adaptations

- **Special levers**
- **Special connections**

To order, see page 12

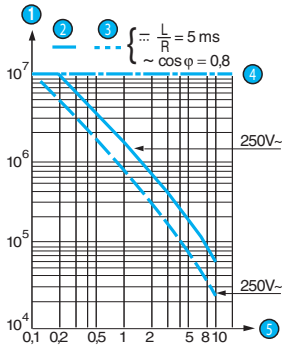
Principles

Single break changeover switch



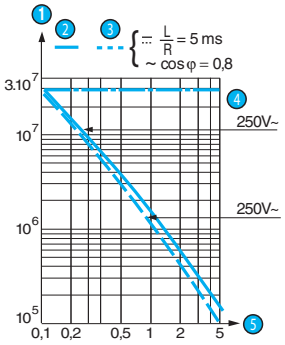
Curves

Operating curve for type 83 170 0



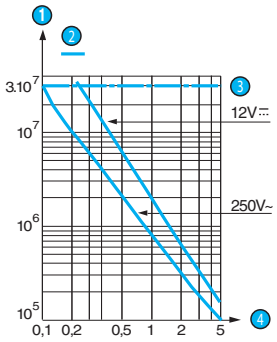
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Operating curve for type 83 170 4



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

Operating curve for types 83 170 8/83 170 9



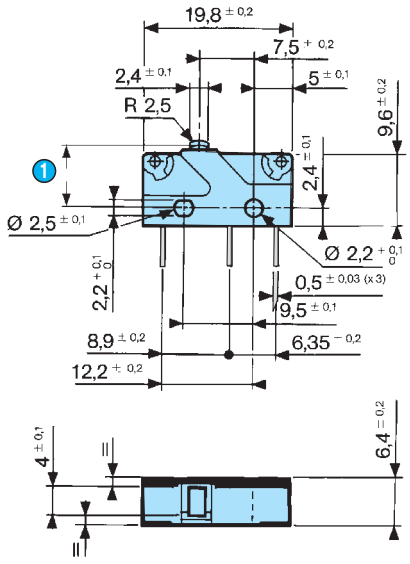
1. Number of cycles
2. Resistive circuit
3. Mechanical life limit
4. Current in Amps

Models 83 170 8 and 83 170 9 are designed to operate equally well on dual-current (1 mA 4 V minimum) 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

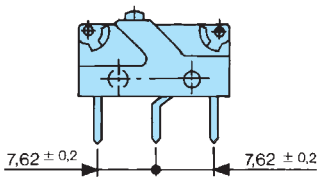
83 170
Asymmetrical version



1. OL = 7.6

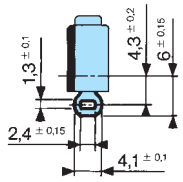
Fixing with M2 screws
Recommended tightening torque : 2 cm daN

83 170 Symmetrical version

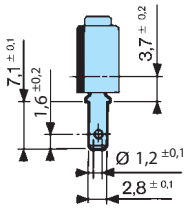


➜ Connections

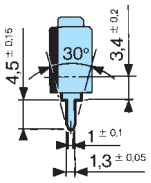
W2



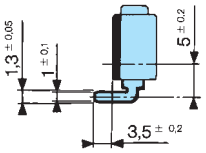
W7A5



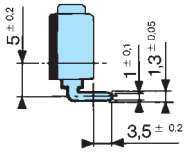
X1 - X1S



X2 - X2S

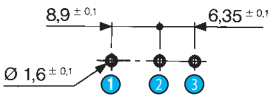


X3 - X3S



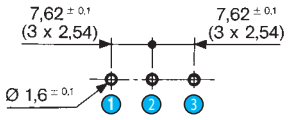
➜ Drilling

Printed circuit board mounting
Asymmetrical X1 - X2 - X3



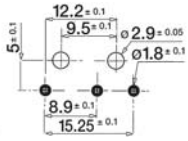
1. 1.C
2. 4.NO
3. 2.NC

Printed circuit board mounting
Symmetrical X1S - X2S - X3S

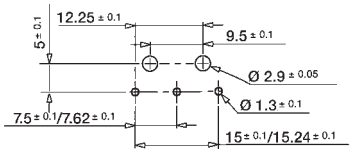


1. 1.C
2. 4.NO
3. 2.NC

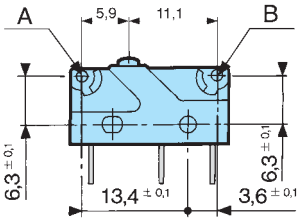
Mounting on a printed circuit board with fixing pins
Asymmetrical



Mounting on a printed circuit board with fixing pins
Symmetrical



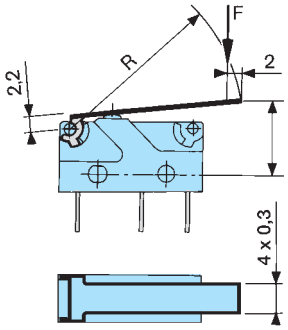
➜ Actuator mounting positions



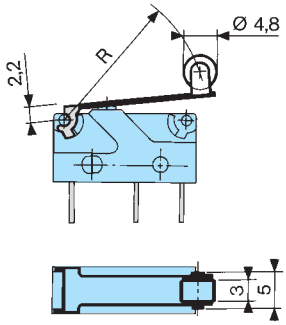
Fixing position
Except where otherwise indicated, levers are supplied unmounted.
For factory mounting, specify fixing position A or B.
To calculate force : divide the switch force by the coefficient in the table.
To calculate travel : multiply the switch travel by the same coefficient.

➜ Actuators

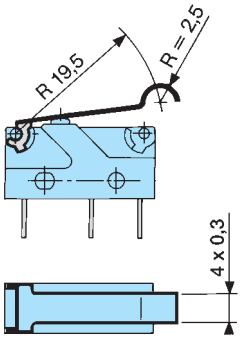
170A



170E

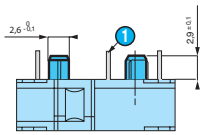


170F



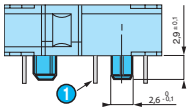
➜ Mounting accessories

Fixing pins



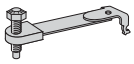
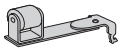
1 Output on unit side : X2

Fixing pins



1 Output on cover side : X3

Actuators and fixing positions

Part numbers for standard actuators	79 253 327		79 253 326		79 253 328		79 218 454		79 253 329	
Actuators	Flat **170A** R18.3		Flat **170A** R24		Flat **170A** R41		Roller **170E** R20		Dummy roller **170F**	
										
Fixing positions										
Coefficient	A	B	A	B	A	B	A	B	A	B
Tripping point	3	1.5	4	2	7	3.5	3	1.5	3	1.5
	10 ±1.4	9.2 ±0.9	10.7 ±1.7	9.6 ±1	12.7 ±3	10.6 ±1.8	15.5 ±1.4	14.5 ±0.9	12.9 ±1.5	11.9 ±1.1
Levers	Screw **170D**		Transverse roller **170EL**							
										

Characteristics available on request

Other information

Mounting - Operation
See basic technical concepts

➜ V4 Mushroom-head button

- Nominal ratings 0.1 A to 10 A/250 VAC
- Minimum rating 1 mA/4 VDC
- Operating temperature up to +125°C
- Operated via multidirectional action
- Conforming to standards EN 61058 and UL 1054
- Choice of actuators with 2 possible fixing positions

Main specifications

Function	Connections	Standard 83 170 0	Low force 83 170 4	Dual-current 83 170 8	Dual-current 83 170 9
I (changeover)	W2 - W7A5 - X1 - X1S - X2 - X2S - X3 - X3S	●	●	●	●
R (normally closed)	W2 - W7A5	●	●	●	●
C (normally open)	W2 - W7A5	●	●	●	●
Electrical characteristics					
Rating nominal / 250 V AC (A)		10	5	0.1*	0.1*
Rating thermal / 250 V AC (A)		12.5	6	6	6
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. permitted overtravel force (N)		10	10	10	10
Rest position max. (mm)		10.8	10.8	10.8	10.8
Tripping point (mm)		$9.9^{\pm 0.3}$	$9.9^{\pm 0.3}$	$9.9^{\pm 0.3}$	$9.9^{\pm 0.3}$
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)		-20 ➞ +125	-20 ➞ +125	-20 ➞ +125	-20 ➞ +125
Mechanical life (operations)		10^6**	10^6	10^6 **	10^6
Contact gap (mm)		0.4	0.4	0.4	0.4
Weight (g)		1.7	1.7	1.7	1.7
Comments					

* see operating curves
** for 2/3 of the overtravel

Additional specifications

Components
Material
- Case : polyester UL 94 VO
- Button : glass-filled polyamide
- Contacts : nickel silver - gold alloy (dual-current)
- Terminals : cupro-nickel except W7A5 in brass

Levers
- Flat : stainless steel
- Roller : stainless steel, polyamide roller

Approvals : NF - UL - cUL

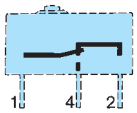
Product adaptations

- Special connections

To order, see page 12

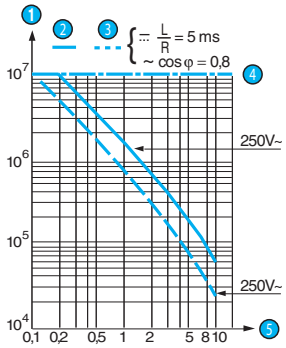
Principles

Single break changeover switch



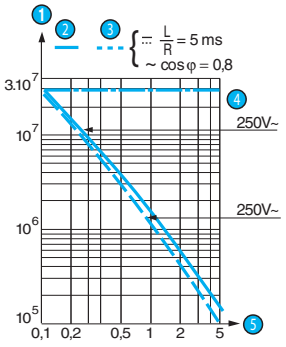
Curves

Operating curve for type 83 170 0



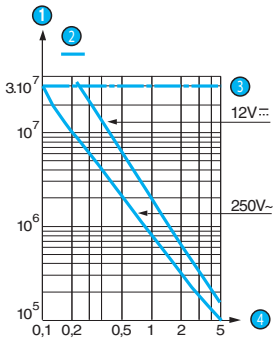
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Operating curve for type 83 170 4



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

Operating curve for types 83 170 8/83 170 9



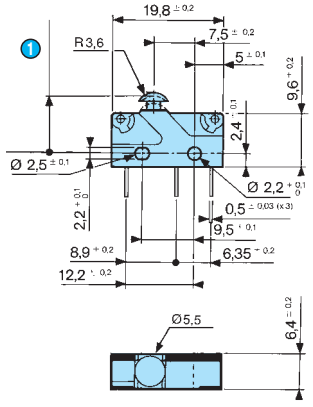
1. Number of cycles
2. Resistive circuit
3. Mechanical life limit
4. Current in Amps

Models 83 170 8 and 83 170 9 are designed to operate equally well on dual-current (1 mA 4 V minimum) 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

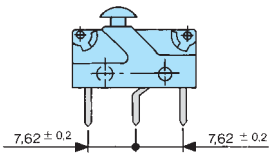
➜ Product

83 170
Asymmetrical version



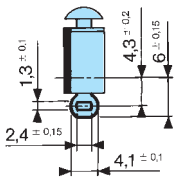
1. OL : 9.1 max.

83 170 Symmetrical version

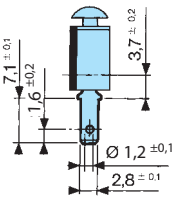


➜ Connections

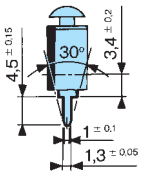
W2



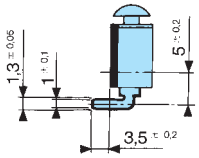
W7A5



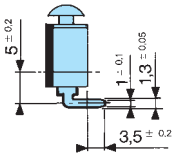
X1 - X1S



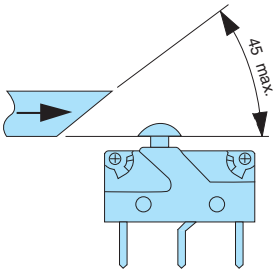
X2 - X2S

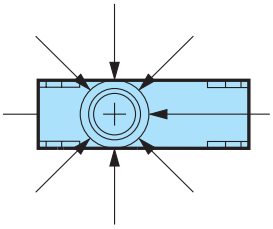


X3 - X3S



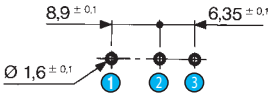
Recommendations for operation from the side





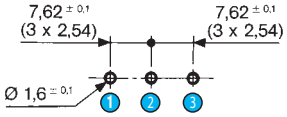
➜ Drilling

Printed circuit board mounting
Asymmetrical X1 - X2 - X3



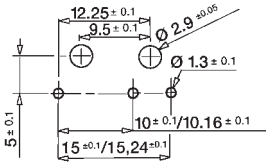
1. 1.C
2. 4.NO
3. 2.NC

Printed circuit board mounting
Symmetrical X1S - X2S - X3S

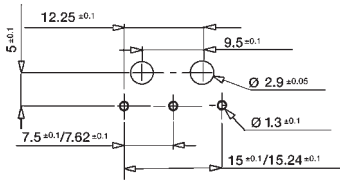


1. 1.C
2. 4.NO
3. 2.NC

Mounting on a printed circuit board with fixing pins
Asymmetrical

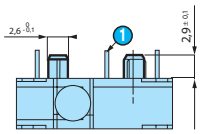


Mounting on a printed circuit board with fixing pins
Symmetrical



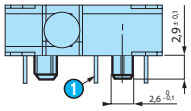
➜ Mounting accessories

Fixing pins



1. Output on unit side : X2

Fixing pins



1. Output on cover side : X3

Other information

Mounting - Operation
See basic technical concepts

Miniature

→ V3

- Nominal ratings 0.1 A to 20 A/250 VAC
- Operating temperature up to +125°C
- Conforming to EN 61058 and UL 1054
- Choice of actuators with 4 possible fixing positions

Main specifications

Function	Connections	High release force 83 161 1	High-current 83 161 2
I (changeover)	W2	83 161 102	●
I (changeover)	W3	83 161 118	●
I (changeover)	W6A5*	83 161 110	●
I (Changeover)	W3R5* - W5 - W6D8* - W7A5 - 2W7A8*	●	●
R (Normally closed)	W2 - W3 - W3R5* - W5 - W6A5* - W6D8* - W7A5 - 2W7A8*	●	●
C (Normally open)	W2 - W3 - W3R5* - W5 - W6A5* - W6D8* - W7A5 - 2W7A8*	●	●
Electrical characteristics			
Rating nominal / 250 V AC (A)		16	20
Rating thermal / 250 V AC (A)		20	22
Mechanical characteristics			
Maximum operating force (N)		3	1
Min. Release force (N)		1	0.2
Maximum total travel force (N)		4.5	2.5
Max. permitted overtravel force (N)		20	20
Maximum rest position (mm)		16.1	16.1
Tripping point (mm)		$14.7^{\pm 0.4}$	$14.7^{\pm 0.4}$
Maximum differential travel (mm)		0.35	0.35
Min. overtravel CRA (mm)		1.1	1.1
Ambient operating temperature (°C)		-20 → +125	-20 → +125
Mechanical life for 2/3 CRA (operations)		10^7	2.5×10^5
Contact gap (mm)		0.4	0.4
Weight (g)		5.6	5.6
Comments			
* for 83 161 6 : W6A5 - W6D8 - W3R5 - 2W7A8 : please consult us			

Additional specifications

Components
Material
- Housings : polyamide or polyester
- Button : polyamide
- Contacts : AgNi

Levers
- Flat : stainless steel
- Roller : stainless steel, glass-filled polyamide roller
- Other polyamides

Approvals : NF

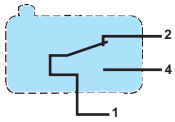
Product adaptations

- Special levers
- Special connections
- Specific fixing
- High operating temperature
- Special operating force
- Approvals : UL - cUL

To order, see page 12

Principles

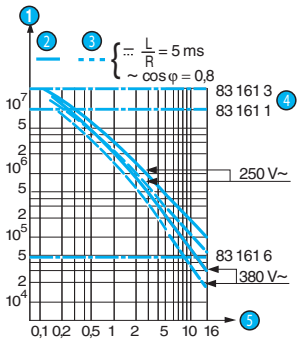
Single break changeover switch



Standard 83 161 3	Low force 83 161 4	Very low force 83 161 5	Very low force 83 161 5 SP 4136	Wide contact gap 83 161 6
83 161 301 83 161 338 83 161 304	●	83 161 502 83 161 501 83 161 503	●	●
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●
16	10	4	4	12
20	12	5	5	15
0.8	0.5	0.25	0.15	5
0.2	0.1	0.05	0.04	0.5
2	1.5	0.40	0.2	6
20	20	20	20	20
16.2	16.2	16.3	16.3	16.1
$14.7^{\pm 0.3}$	$14.7^{\pm 0.4}$	$14.7^{\pm 0.4}$	$14.7^{\pm 0.3}$	$14.5^{\pm 0.4}$
0.35	0.35	0.35	0.35	0.8
1.2	1.2	1.1	1.2	0.9
-20 → +125	-20 → +125	-20 → +125	-20 → +125	-20 → +125
2×10^7	3×10^7	5×10^7	5×10^7	5×10^4
0.4	0.4	0.4	0.4	3.2
5.6	5.6	5.6	5.6	5.6

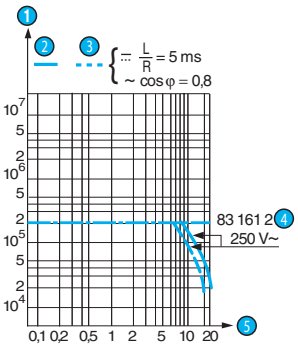
Curves

Operating curve for types 83 161 1 / 83 161 3 / 83 161 6



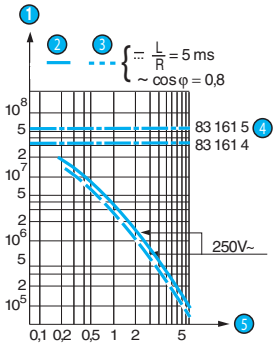
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Operating curve for type 83 161 2



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

Operating curve for types 83 161 4 / 83 161 5 / 83 161 5 SP 4136

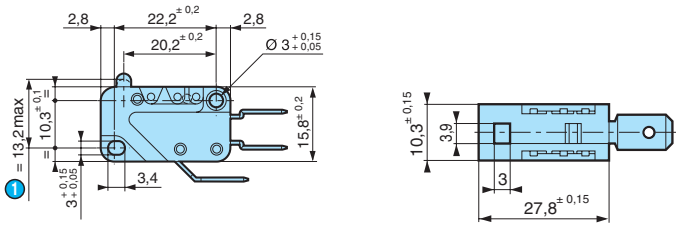


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

➜ Product

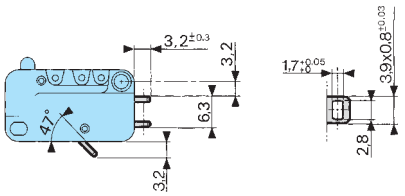
83 161



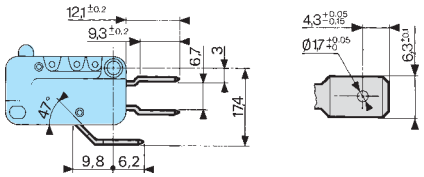
1 OL

➜ Connections

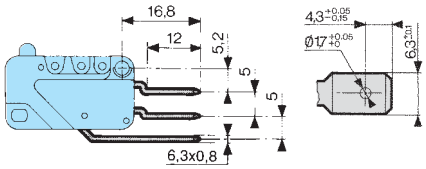
W2 solder



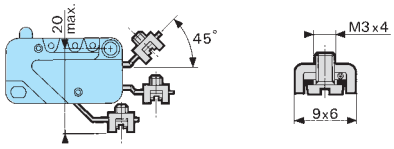
W3 for 6.35 mm clips (6.3 x 0.8)



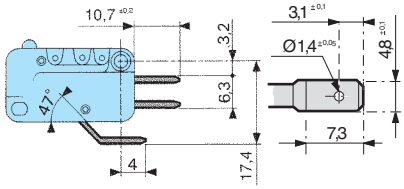
W3R5 for 6.35 mm clips (6.3 x 0.8)



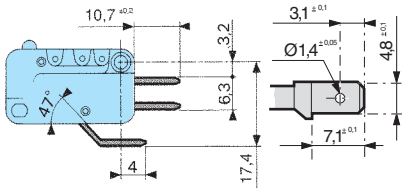
W5 screw



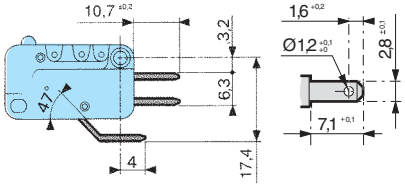
W6A5 for 4.8 mm clips (4.8 x 0.5)



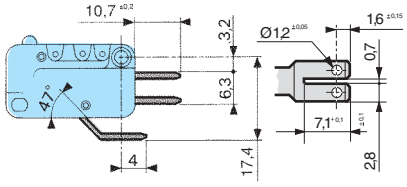
W6D8 for 4.8 mm clips (4.8 x 0.8)



W7A5 for 2.8 mm clips (2.8 x 0.5)

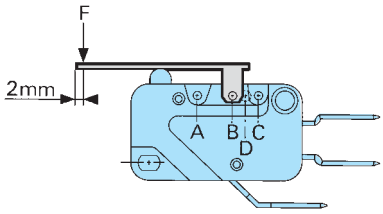


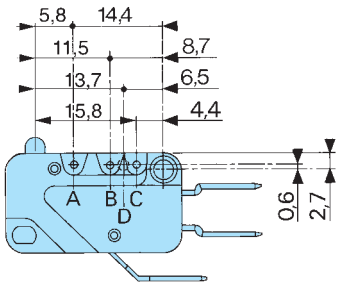
2W7A8 for 2.8 mm clips (2.8 x 0.8)



➜ Actuator mounting positions

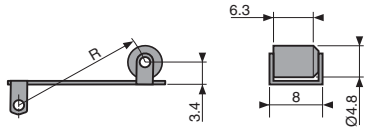
Levers



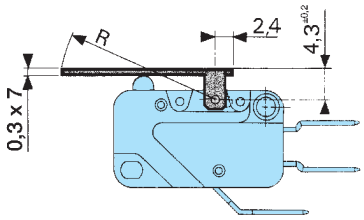


To calculate force
Divide the switch force by the coefficient given in the table.
To calculate travel
Multiply the switch travel by the same coefficient.
Example :
83 161 3 with lever 161 A - R 25.4 position A (coeff. 4)
Operating force : 0.8 : 4 = 0.2 N
Pre-travel : 1.4 x 4 = 5.6 mm

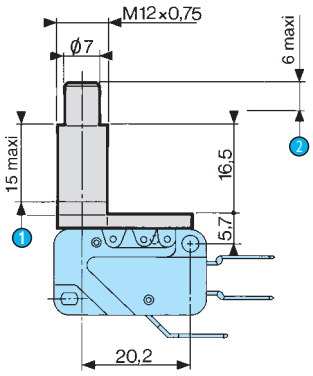
161 E



161 A



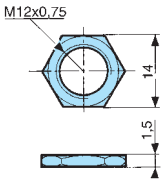
161 L



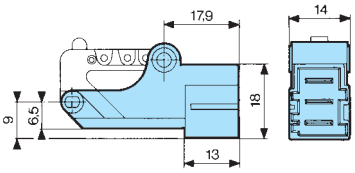
1 Thread
2 Total travel

Nut thickness	Max. torque
1,5 mm	5 Cm N
2 mm	7 Cm N
2,5 mm	10 Cm N

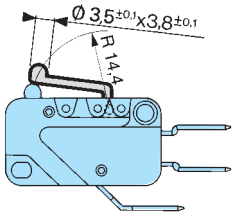
Nut 70 602 118



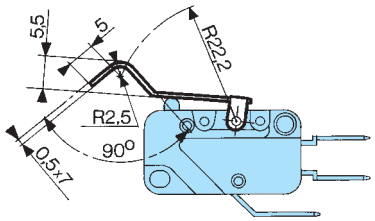
Housing 161 J for connections W3 R5



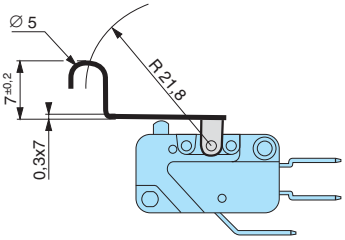
161 V



161 F

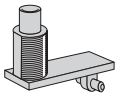
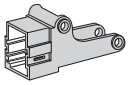


161 G



Actuators and fixing positions

Part numbers for standard actuators	**79 215 740**		**70 507 524**			**79 215 742**		**79 507 529**			**79 507 528**	
Actuators	Plain **161A** R14,2 		Plain **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	1,8
Tripping point (except 83 161 6)	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
Tripping point 83 161 6	14,8 ±1	15 ±0,45	14,4 ±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 ±2

Part numbers for standard actuators	**79 218 651**							
Actuators	Dummy roller **161G** R21,8 		**Telescopic plunger **161 L** 	Manual action	**161V** 	Housing **161J** 	Nut for **161L** Part no.: 70 602 118 	
Fixing positions	A	B	D		D			
Coefficient	3	1,8	1		1			
Tripping point (except 83 161 6)	21,7 ±2	21,7 ±0,7	21,5 ±1		18,35 ±0,45			
Tripping point 83 161 6	21,5 ±2	21,5 ±0,7	21,5 ±1					

Except where otherwise indicated, plain and roller levers are supplied unmounted.
For factory mounting, specify fixing position A, B or C.
** For 83 161 1, 83 161 2, 83 161 3, 83 161 6 mounted in factory (supplied without nut)

1

Other information

Mounting - Operation
See basic technical concepts

➜ V3 Dual-current

- Minimum rating 1 mA/4 VDC
- Operating temperature up to +125°C
- Conforming to EN 61058 and UL 1054
- Choice of actuators with 4 possible fixing positions

Main specifications

Function	Connections	Dual-current 83 161 8	Dual-current very low force 83 161 9	Ultra light dual-current 83 161 9 SP 4136
I (Changeover)	W2	83 161 801	●	●
I (Changeover)	W3	83 161 806	●	●
I (Changeover)	W6A5	83 161 812	●	●
I (Changeover)	W3R5 - W5 - W6D8 - W7A5 - 2W7A8	●	●	●
R (Normally closed)	W2 - W3 - W3R5 - W5 - W6A5 - W6D8 - W7A5 - 2W7A8	●	●	●
C (Normally open)	W2 - W3 - W3R5 - W5 - W6A5 - W6D8 - W7A5 - 2W7A8	●	●	●
Electrical characteristics				
Rating nominal / 250 V AC (A)		0.1	0.1	0.1
Rating thermal / 250 V AC (A)		6	6	5
Mechanical characteristics				
Maximum operating force (N)		0.8	0.25	0.15
Min. Release force (N)		0.2	0.05	0.04
Maximum total travel force (N)		2	0.40	0.2
Max. permitted overtravel force (N)		20	20	20
Maximum rest position (mm)		16.2	16.3	16.3
Tripping point (mm)		$14.7^{\pm 0.3}$	$14.7^{\pm 0.4}$	$14.7^{\pm 0.3}$
Maximum differential travel (mm)		0.35	0.35	0.35
Min. overtravel CRA (mm)		1.2	1.1	1.2
Ambient operating temperature (°C)		-20 → +125	-20 → + 125	-20 → +125
Mechanical life for 2/3 CRA (operations)		2×10^7	5×10^7	5×10^7
Contact gap (mm)		0.4	0.4	0.4
Weight (g)		5.6	5.6	5.6

Additional specifications

Components
Material
- Housings : polyamide or polyester
- Button : polyamide
- Contacts : gold alloy

Levers
- Flat : stainless steel
- Roller : stainless steel, glass-filled polyamide roller
- Other polyamides

Approvals : NF

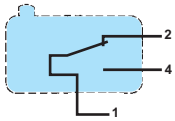
Product adaptations

- Special levers
- Special connections
- Specific fixing
- High operating temperature
- Special operating force
- Approvals : UL - cUL

To order, see page 12

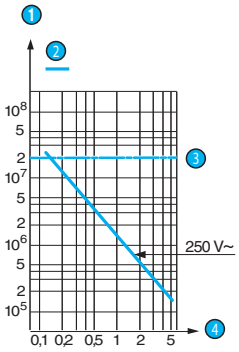
Principles

Single break changeover switch



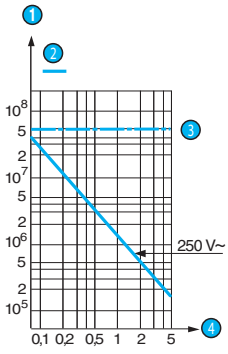
Curves

Operating curve for type 83 161 8



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

Operating curve for types 83 161 9 and 83 161 9 SP 4136



1. Number of cycles
2. Mechanical life limit
3. Mechanical life limit
4. Current in Amps

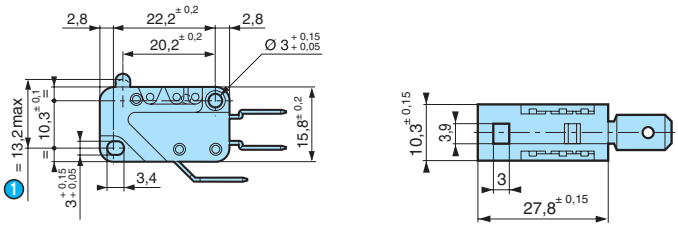
For types 83 161 8 - 9 and 9 SP 4136 Dual-current

These models are designed to operate equally well on dual-current (1 mA 4 V minimum) 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

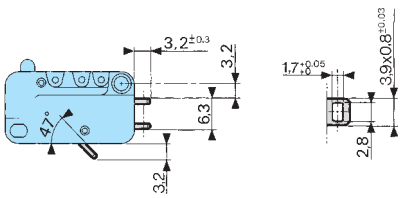
83 161



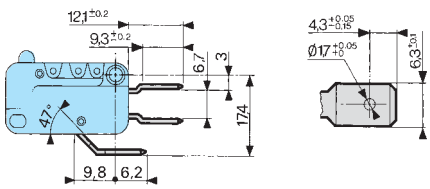
1 OL

➜ Connections

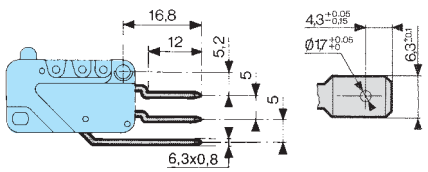
W2 solder



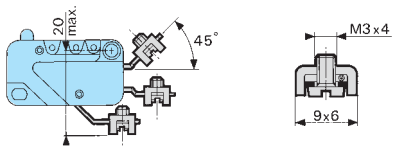
W3 (6.3 x 0.8) for 6.35 mm clips



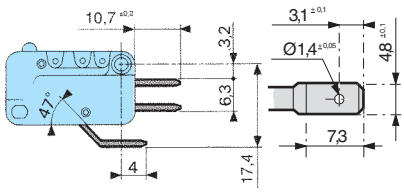
W3R5 (6.3 x 0.8) for 6.35 mm clips



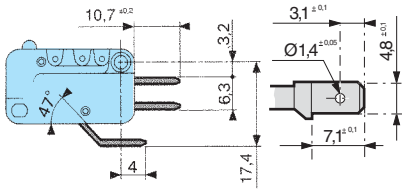
W5 screw



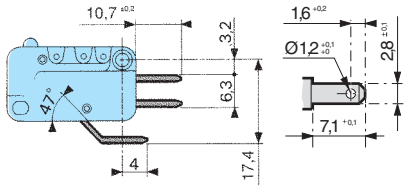
W6A5 (4.8 x 0.5) for 4.8 mm clips



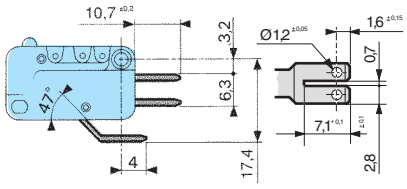
W6D8 (4.8 x 0.8) for 4.8 mm clips



W7A5 (2.8 x 0.5) for 2.8 mm clips

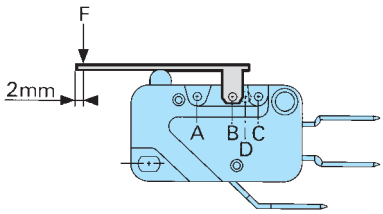


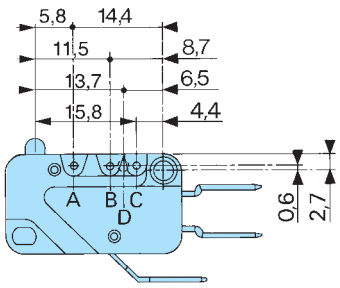
2W7A8 2 x (2.8 x 0.8) for 2.8 mm clips



➜ Actuator mounting positions

Levers

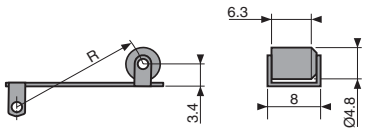




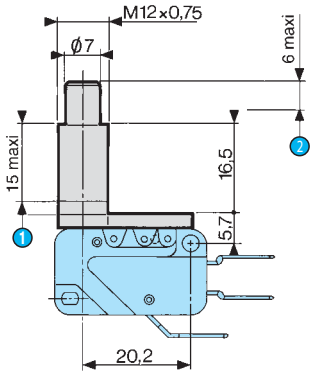
To calculate force
Divide the switch force by the coefficient given in the table.
To calculate travel
Multiply the switch travel by the same coefficient.
Example :
83 161 8 with lever 161 A - R 25.4 position A (coeff. 4)
Operating force : 0.8 : 4 = 0.2 N
Pre-travel : 1.4 x 4 = 5.6 mm

➜ Actuators

161 E



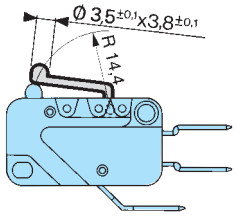
161 L



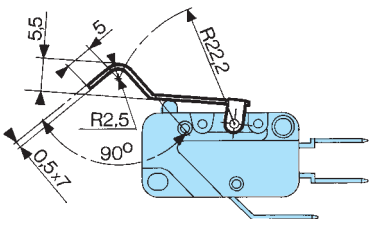
1 Thread
2 Total travel

Nut thickness	Max. torque
1,5 mm	5 Cm N
2 mm	7 Cm N
2,5 mm	10 Cm N

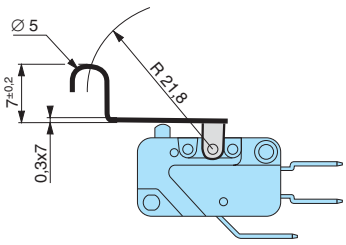
161 V



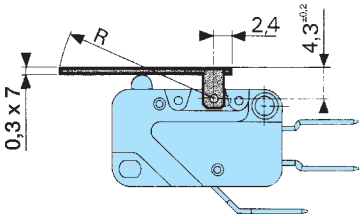
161 F



161 G

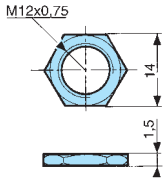


161 A

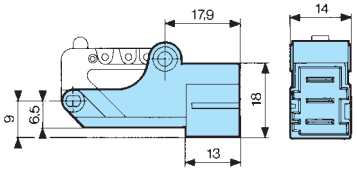


➜ Mounting accessories

Nut 70 602 118



Housing 161 J for connections W3 R5



Actuators and fixing positions

Part numbers for standard actuators	**79 215 740**		**70 507 524**			**79 215 742**		**79 507 529**			**79 507 528**	
Actuators	Plain **161A** R14,2		Plain **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	1,8
Tripping point (except 83 161 6)	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
Tripping point 83 161 6	14,8 ±1	15 ±0,45	14,4 ±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 ±2

Part numbers for standard actuators	**79 218 651**						
Actuators	Dummy roller **161G** R21,8		**Telescopic plunger **161 L**	Manual action	**161V**	Housing **161J**	Nut for **161L** Part no.: 70 602 118
Fixing positions	A	B	D		D		
Coefficient	3	1,8	1		1		
Tripping point (except 83 161 6)	21,7 ±2	21,7 ±0,7	21,5 ±1		18,35 ±0,45		
Tripping point 83 161 6	21,5 ±2	21,5 ±0,7	21,5 ±1				

Except where otherwise indicated, plain and roller levers are supplied unmounted.
For factory mounting, specify fixing position A, B or C.
** For 83 161 1, 83 161 2, 83 161 3, 83 161 6 mounted in factory (supplied without nut)

Other information

Mounting - Operation
See basic technical concepts

Miniature

➜ 83 160

- **Nominal ratings up to 16 A/250 VAC**
- **Self-cleaning contacts**
- **3 mm contact gap for type 83 160 6**
- **High DC switch rating for type 83 160 6 SP 3697**
- **Choice of actuators**
- **Approvals NF - UL (except 83 160 6 SP 3697)**

Main specifications

		Standard 83 160 0
Function	**Connections**	
I (changeover)	W3	**83 160 006**
I (changeover)	W2 - W6 - X1 *	●
R (normally closed)	W2 - W3 - W6 - X1 *	●
C (normally open)	W2 - W3 - W6 - X1 *	●
Electrical characteristics		
Rating nominal / 250 V AC (A)		16
Rating thermal / 250 V AC (A)		20
Rating nominal / 250 V DC (A)		-
Rating thermal / 250 V DC (A)		-
Mechanical characteristics		
Maximum operating force (N)		4
Min. Release force (N)		1.5
Maximum total travel force (N)		6.5
Max. permitted overtravel force (N)		20
Rest position max. (mm)		15.6
Tripping point (mm)		$14.8^{\pm 0.3}$
Maximum differential travel (mm)		0.3
Min. overtravel CRA (mm)		1.3
Ambient operating temperature (°C)		-20 → +125
Mechanical life for 2/3 CRA (operations)		10^7
Contact gap (mm)		1.2
Weight (g)		6.7
Comments		
* X1 for 83 160 6 and 83 160 6 SP 3697 : please consult us		

Additional specifications

Components
Material
- Case : 83 160 0, 3, 4 and 6 polyamide UL94VO.
- Contacts : nickel silver

Lever
- stainless steel
- polyamide roller

Approvals : NF

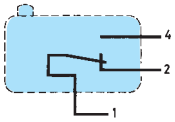
Product adaptations

- **Special levers**
- **Approvals : NF - UL for 83 160 6 SP 3697**

To order, see page 12

Principles

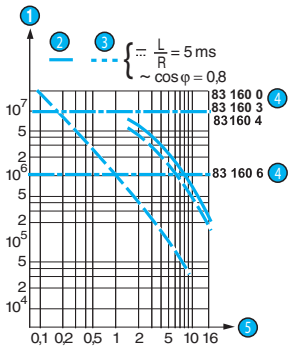
Single break changeover switch



Reduced force 83 160 3	Low force 83 160 4	3 mm contact gap 83 160 6	High DC switch rating 83 160 6 SP 3697
83 160 301	83 160 401	●	●
●	●	●	●
●	●	●	●
●	●	●	●
10	6	16	-
15	10	20	-
-	-	-	5
-	-	-	5
2	1	5	5
0.6	0.3	1	1
3	1.5	7	7
20	20	20	20
15.6	15.6	15.7	15.7
$14.8^{\pm 0.3}$	$14.7^{\pm 0.3}$	$14.6^{\pm 0.4}$	$14.6^{\pm 0.4}$
0.4	0.35	0.7	0.7
1.3	1.3	1	1
-20 → +125	-20 → +125	-20 → +125	-20 → +125
10^7	10^7	10^6	10^8
1.2	1.2	3.2	3.2
6.7	6.7	6.7	6.7

Curves

Operating curve for types 83 160 0 / 3 / 4 / 6



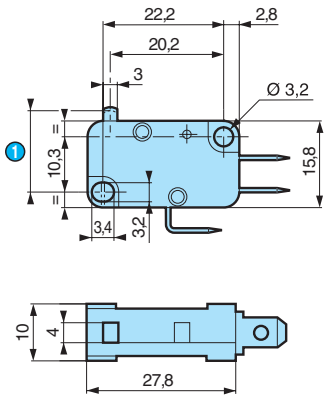
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

83 160 6 SP 3697
at 250 VDC 1 A L/R 5 ms = 15000 cycles
at 130 VDC 2.6 A L/R 5 ms = 15000 cycles

Dimensions

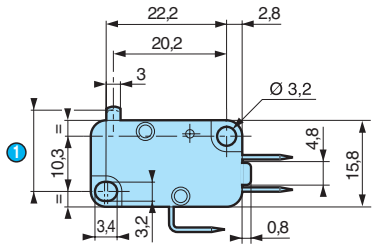
➜ Product

83 160 0 / 3 / 4 / 6



1 OL = 13.2 max.

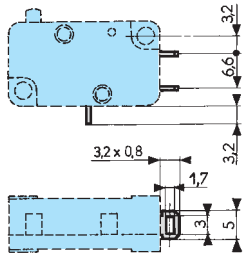
83 160 6 SP 3697



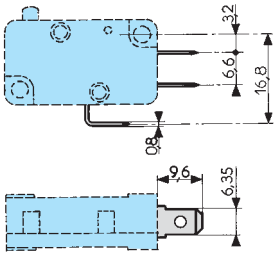
1 OL = 13.2 max.

➜ Connections

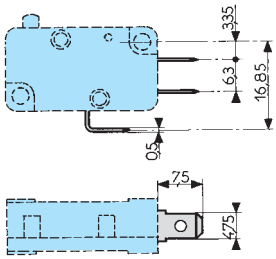
W2 solder



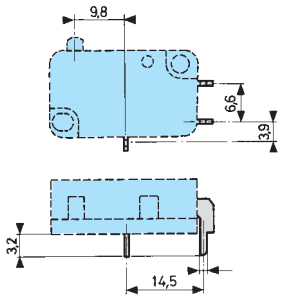
W3 for 6.35 mm clips



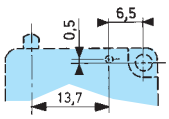
W6 for 4.75 mm clips



X1 printed circuit board

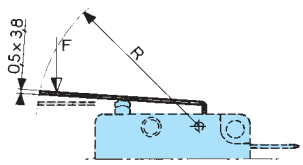


➜ Actuator mounting positions

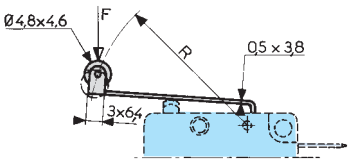


➜ Actuators

153 AX



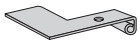
153 EX



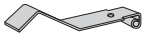
Actuators and fixing positions

Part numbers for standard actuators		70 545 0 / 153 A R29.7			70 545 0 / 153 E R15,8			70 545 0 / 153 E R28.7		
Actuators		Flat **153 AX** R29.7			Roller **153 EX** R15,8			Roller **153 EX** R28.7		
										
		831600	**831603**	**831606**	**831600**	**831603**	**831606**	**831600**	**831603**	**831606**
Fixing positions	mm	15.3 ±0.5	15.3 ±0.5	14.4 ±0.6	20.5 ±0.45	20.5 ±0.45	20.3 ±0.55	20.5 ±0.65	20.5 ±0.65	19.6 ±0.75
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
Pre-travel - 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	2.3	2.3	2.3	2.3	2.3	2.3	4.6	4.6	4.6

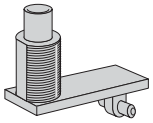
2-pole **153 A2**** R15,9



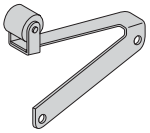
Dummy roller **F**** R24.3



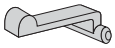
Telescopic plunger **153L****
(operating temperature 125°C max.)



Flexible with roller **153 B****



153 V**



** Please consult us

Other information

Mounting - Operation
See basic technical concepts

Miniature

➜ 83 160 7 A+

- **Snap action contacts with positive break operation**
- **Conformity with EN 60947.5.1**
- **Self-cleaning contacts**
- **Operating temperature up to 125°C**
- **Choice of actuators**

Main specifications

		83 160 7 A+ Normally closed	83 160 7 A+ Changeover
Function	**Connections**		
R (normally closed)	W2 - W3 - W6 - X1	●	-
I (changeover) *	W2 - W3 - W6 - X1	-	●
Electrical characteristics			
Working voltage (Ue) V		250	250
Assigned operating current (Ie)		6	6
Thermal current (Ith) A		10	10
Assigned insulation voltage (Ui) V		250	250
Mechanical characteristics			
Maximum operating force (N)		4	4
Min. Release force (N)		1.5	1.5
Minimum positive opening force (N)		18	18
Max. permitted overtravel force (N)		200	200
Rest position max. (mm)		15.7	15.7
Tripping point (mm)		$14.8^{\pm 0.3}$	$14.8^{\pm 0.3}$
Maximum positive opening position (mm)		13.5	13.5
Min. overtravel (mm)		1.3	1.3
Operating speed max. (m/s)		0.5	0.5
Operating rate max. (operation/s)		5	5
Ambient operating temperature (°C)		-40 → +85	-40 → +85
Mechanical life (operations)		10^7	10^7
Contact gap (mm)		> 3	1.2
Weight (g)		7	7
Comments			

* The Changeover version conforms to standard EN 60947.5.1 if only the normally closed contact is used.
The microswitch operating principle forces the contacts open even in the event of welding (positive break operation).

Additional specifications

Components
Material
- Case : polyamide UL94VO
- Cover : transparent polycarbonate
- Contacts : nickel silver
- Positive rocker : high temperature thermoplastic

Lever
- Stainless steel
- Polyamide roller

Electrical life
- Max. operations : 20 cycles/min
- Resistive load at 250VAC 16 A : 10^5 cycles
- Inductive load (EN 60 947.5.1) :

AC 15 :
250 VAC 6A : 0.3 X 10^5 cycles DC 13 :
DC 13 :
24 VDC 20 W L/R = 40 ms : 3 x 10^5 cycles
120 VDC 20W L/R = 40 ms : 5 x 10^5 cycles

Electrical characteristics
Short-circuit test
(acc. to EN 60947.5.1 paragraph 8.34)
- Prospective peak current 1000 A at 250 V AC 0.5< cos φ < 0.7
- Short-circuit protection device (SCPD) : fuse 10 A gG
- Electrical impulse withstand current EN60060 (1.2/50 µs) : 2500 V

Product adaptations

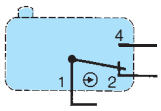
- **Special levers**
- **UL approval**

To order, see page 12

Principles

Function
Contact element conforming to standards NFC 63 143 or EN 60 947.5.1.

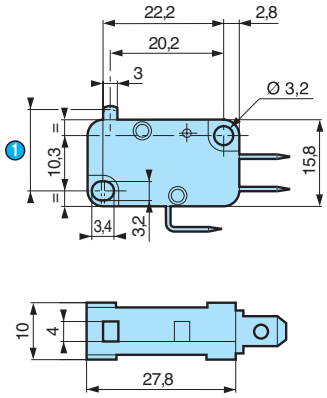
Single break changeover switch



Dimensions

➜ Product

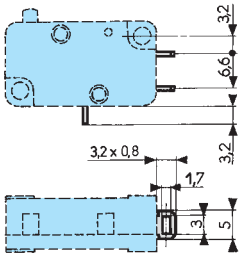
83 160 7 A+



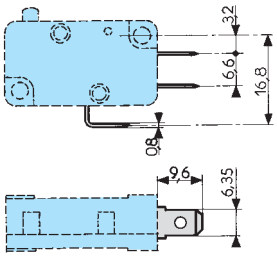
1 OL = 13.2 max.

➜ Connections

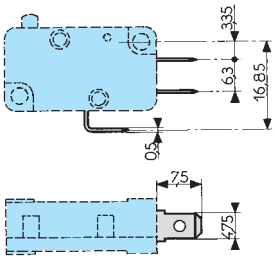
W2 solder



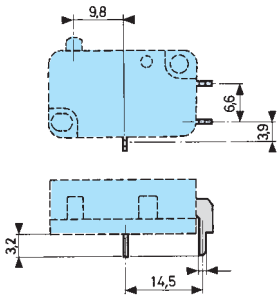
W3 for 6.35 mm clips



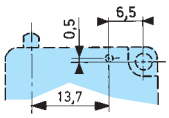
W6 for 4.75 mm clips



X1 printed circuit board

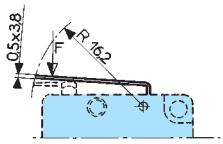


➜ Actuator mounting positions

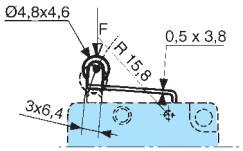


➜ Actuators

139 AX+

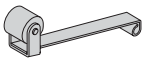


139 EX+

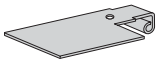
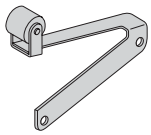
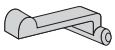


Actuators and fixing positions

Part numbers for standard actuators

Actuators		**139 AX** + R16,2 mm	**139 EX** + R15,8 mm
			
Operating force - max.	N	4	4
Release force - max.	N	1	1
Max. positive opening force	N	18	18
Permitted overtravel force - max.	N	200	200
Maximum rest position	mm	16,2	21,3
Tripping point	mm	15,3 $^{\pm 0,3}$	20,5 $^{\pm 0,45}$
Maximum positive opening position	mm	14	19,2

We recommend that levers are assembled in our factories

139 A2X + R24 mm**	**153 B****	**153 V****
		

** Consult us.

Other information

Definitions
P.O.F. Minimum Positive Opening Force. The operating force that has to be applied to the operating device to produce the positive opening action.
P.O.P. Maximum Positive Opening Point. The position of the operating device at the moment when positive opening of the contacts occurs.

For other definitions : see "Basic concepts".

Mounting - Operation
See basic technical concepts

Miniature

➜ 83 137 0

- Action with a wire
- Very low operating force
- Long mechanical life

Main specifications

Function	Connections	With standard rotary action 83 137 0
		83 137 004
I (changeover)	W3	●
I (changeover)	W2	●
R (normally closed)	W2 - W3	●
C (normally open)	W2 - W3	●
Electrical characteristics		
Rating nominal / 250 V AC (A)		5
Rating thermal / 250 V AC (A)		14
Mechanical characteristics		
maximum operating force N cm		0.12
Minimum release torque N cm		0.03
Overtravel torque N cm		0.5
Pre-travel- maximum (°)		26
Maximum differential travel (°)		14
Min. overtravel (°)		12
Ambient operating temperature (°C)		-20 → +125
Mechanical life (operations)		10^7
Contact gap (mm)		0.8
Weight (g)		7.2

Additional specifications

Components
Material
- Case : polyamide.
- Contacts : silver.

Lever
- Stainless steel wire.

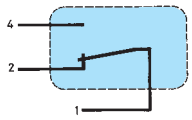
Product adaptations

- Special levers
- UL approval

To order, see page 12

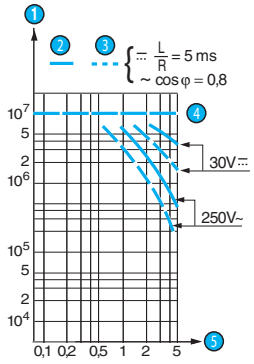
Principles

Single break changeover switch



Curves

Operating curve for type 83 137 0

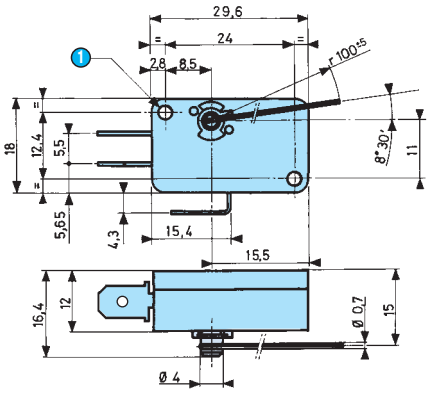


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

➜ Product

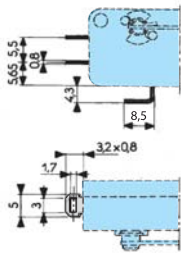
83 137 0



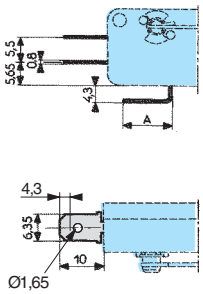
1. 2 holes Ø 3.2

➜ Connections

W2 solder



W3 for 6.35 mm clips



Other information

Mounting - Operation
See basic technical concepts

Protected

➜ 83 106

- Double break switching
- Options for operation in stable positions
- Choice of actuators and fixing positions



Main specifications

		Standard 83 106 0	2 stable lever positions 83 106 4	2 stable plunger positions 83 106 7
Function	**Connections**			
I (changeover)	W3	**83 106 022**	●	●
I (changeover)	W1 - W2	●	●	●
R (normally closed)	W1 - W2 - W3	●	●	●
C (normally open)	W1 - W2 - W3	●	●	●
Electrical characteristics				
Rating nominal / 250 V AC (A)		5	5	5
Rating thermal / 250 V AC (A)		17.5	17.5	17.5
Mechanical characteristics				
Maximum operating force (N)		4	0.45	2
Min. Release force (N)		1	-	-
Tripping point (mm)		$11.45^{\pm 0.2\ -0.25}$	-	-
Min. overtravel (mm)		0.7	-	-
Mechanical life (operations)		10^7	10^6	10^6
Max. permitted overtravel force (N)		20	-	-
Rest position max. (mm)		12.75	-	-
differential travel (mm)		$0.5^{\pm 0.2}$	-	-
Ambient operating temperature (°C)		-40 → +85	-40 → +85	-40 → +85
Contact gap (mm)		0.4 x 2	0.4 x 2	0.4 x 2
Weight (g)		8	9	8

Additional specifications

Components
Material
- Case : polyamide UL94V2 (83 106)
- Contacts : nickel silver

Levers
- Mild steel (zinc)
- Roller : polyamide
- Adjusting screws : self-retaining
- Plates : iridescent passivated mild steel (zinc)

NB : Fixing holes for these microswitches have metal ferrules.

Product adaptations

- Special levers
- Reinforced spring
- Special contacts
- Approvals : UL - cUL

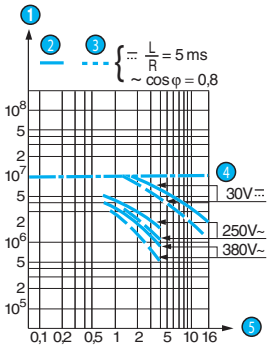
To order, see page 12

Principles

Double break changeover switch

Curves

Operating curve for types 83 106 0 / 4 / 7

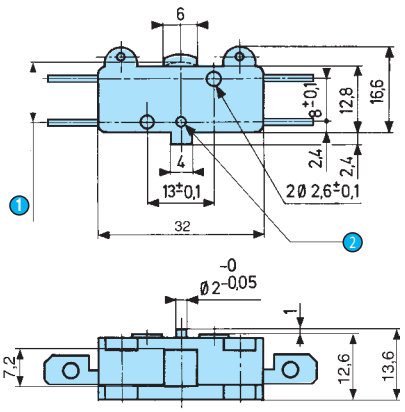


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

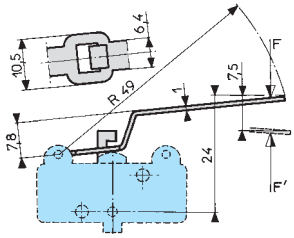
➜ Product

83 106

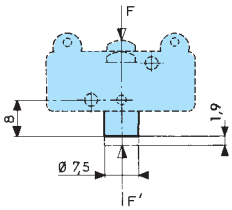


1. OL = 10.65
2. Ø $2^{+0.01}_{+0.65}$ Depth 1.2

83 106 4

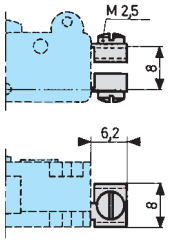


83 106 7

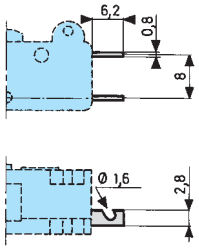


➜ Connections

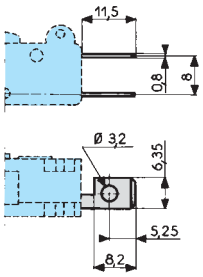
W1 screw



W2 solder

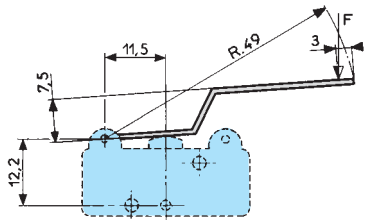


W3 for 6.35 mm clips



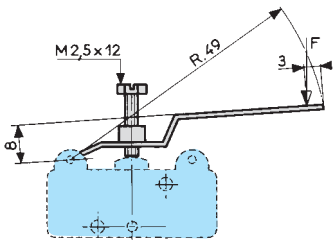
➜ Actuators

A



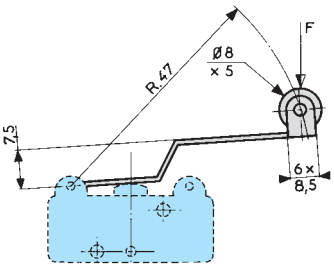
Lever cross-section 1 x 6.4 mm

B



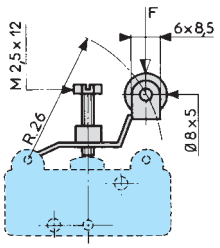
Lever cross-section 1 x 6.4 mm

E



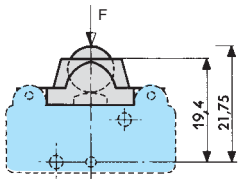
Lever cross-section 1 x 6.4 mm

Q

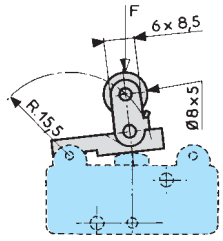


Lever cross-section 1 x 6.4 mm

B9



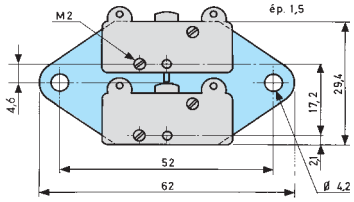
V3



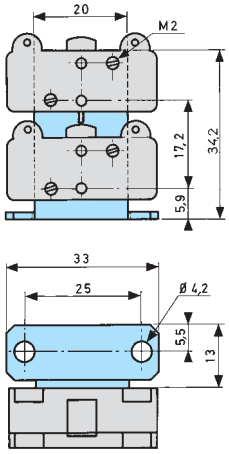
Lever cross-section 1 x 6.4 mm

➜ Mounting accessories

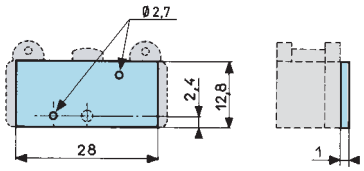
O2
2-pole side mounting plate



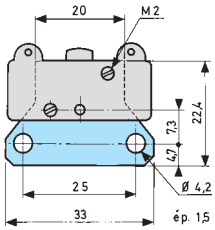
K2
2-pole vertical mounting plate



Y
Side plate



H
Horizontal single-pole mounting plate



Unless indicated, the thickness of plates is 1.5 mm

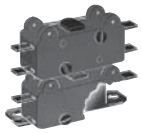
Actuators and fixing positions

Actuators and fixing positions

Actuators		**A** R49	**B** R47	**E** R47	**Q**	**V3** R15.5	**B9**
							
Operating force - max.	N	1.2	1.2	1.2	2.8	4	4
Release force - min.	N	0.25	0.25	0.2	0.45	0.8	1
Pre-travel - max.	mm	6.2	6.2	6.2	3.2	1.45	1.5
Differential travel	mm	2.1 $^{\pm 0.9}$	2.1 $^{\pm 0.9}$	2.1 $^{\pm 0.9}$	1.05 $^{\pm 0.4}$	0.5 $^{\pm 0.2}$	0.5 $^{\pm 0.2}$
Total travel max.	mm	7.5	8.4	7.5	4.5	1.9	1.9

Except where otherwise indicated, the flat and roller levers are mounted as shown in the dimensional drawings (mounted on the left).

Mounting accessories

Y Side plate	**H** Horizontal single-pole mounting plate	**O2** 2-pole side mounting plate	**K2** 2-pole vertical mounting plate
			

Other information

Mounting - Operation
See basic technical concepts

Protected

➜ 83 109

- Double break switching
- Front connections
- Options for operation in stable positions
- Choice of actuators and fixing positions

Main specifications

		Outputs on front face 83 109 0
Function	**Connections**	
I (changeover)	W2	**83 109 004**
R (normally closed)	W2	●
C (normally open)	W2	●
Electrical characteristics		
Rating nominal / 250 V AC (A)		5
Rating thermal / 250 V AC (A)		17.5
Mechanical characteristics		
Maximum operating force (N)		4
Min. Release force (N)		1
Tripping point (mm)		$11.45^{+0.2\ -0.25}$
Min. overtravel (mm)		0.7
Mechanical life (operations)		10^7
Max. permitted overtravel force (N)		20
Rest position max. (mm)		12.75
differential travel (mm)		$0.5^{\pm 0.2}$
Ambient operating temperature (°C)		- 40 → +85
Contact gap (mm)		0.4 x 2
Weight (g)		8

Additional specifications

Components
Material
- Case : polyamide UL94V2
- Contacts : nickel silver

Levers
- Mild steel (zinc)
- Roller : polyamide
- Adjusting screws : self-retaining
- Plates : iridescent passivated mild steel (zinc)

NB : Fixing holes for these microswitches have metal ferrules.

Product adaptations

- Special levers
- Reinforced spring
- Special contacts
- Approvals : UL - cUL

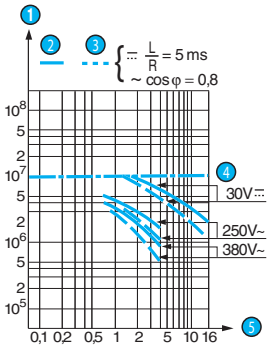
To order, see page 12

Principles

Double break changeover switch

Curves

Operating curve for type 83 109 0

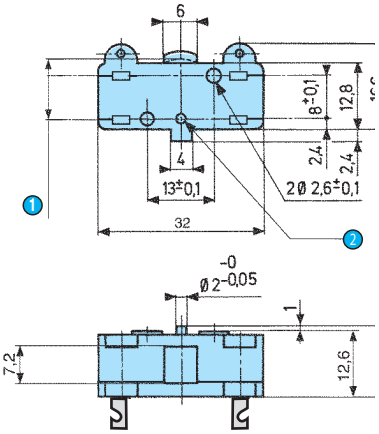


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

➜ Product

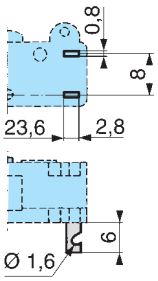
83 109 0



1. OL = 10.65
2. Ø $2^{+0.01}\ ^{+0.65}$ Depth 1.2

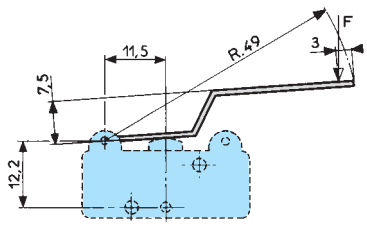
➜ Connections

W2 solder



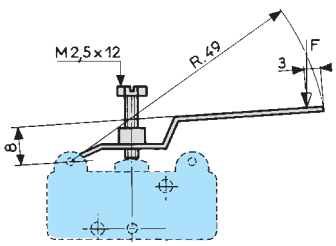
➜ Actuators

A



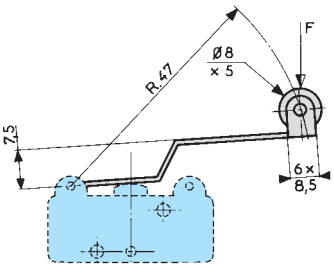
Lever cross-section 1 x 6.4 mm

B



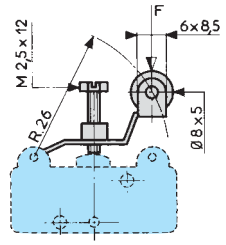
Lever cross-section 1 x 6.4 mm

E



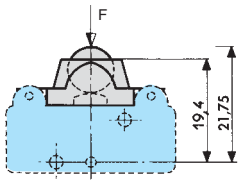
Lever cross-section 1 x 6.4 mm

Q

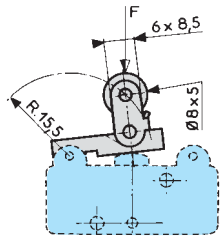


Lever cross-section 1 x 6.4 mm

B9



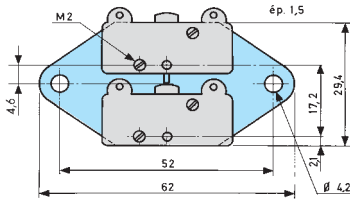
V3



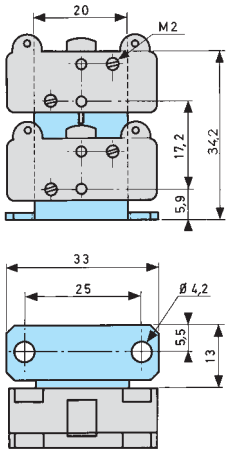
Lever cross-section 1 x 6.4 mm

➜ Mounting accessories

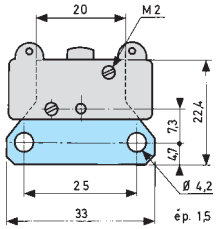
O2
2-pole side mounting plate



K2
2-pole vertical mounting plate



H
Horizontal single-pole mounting plate



Unless indicated, the thickness of plates is 1.5 mm

Actuators and fixing positions

Actuators and fixing positions

Actuators		**A** R49	**B** R47	**E** R47	**Q**	**V3** R15,5	**B9**
							
Operating force - max.	N	1.2	1.2	1.2	2.8	4	4
Release force - min.	N	0.25	0.25	0.2	0.45	0.8	1
Pre-travel - max.	mm	6.2	6.2	6.2	3.2	1.45	1.5
Differential travel	mm	2.1 ±0.9	2.1 ±0.9	2.1 ±0.9	1.05 ±0.4	0.5 ±0.2	0.5 ±0.2
Total travel max.	mm	7.5	8.4	7.5	4.5	1.9	1.9

Except where otherwise indicated, the flat and roller levers are mounted as shown in the dimensional drawings (mounted on the left)..

Mounting accessories

H Horizontal single-pole mounting plate	**O2** 2-pole side mounting plate	**K2** 2-pole vertical mounting plate
		

Other information

Mounting - Operation
See basic technical concepts

Protected

➜ 83 112

- Double break switching
- Flush-mounted connections
- Options for operation in stable positions
- Choice of actuators and fixing positions

Main specifications

Function	Connections	Flush-mounted connections 83 112 0
I (changeover)	W1	83 112 001
Electrical characteristics		
Rating nominal / 250 V AC (A)		5
Rating thermal / 250 V AC (A)		17.5
Mechanical characteristics		
Maximum operating force (N)		4
Min. Release force (N)		1
Tripping point (mm)		$11.45^{+0.2\ -0.25}$
Min. overtravel (mm)		0.7
Mechanical life (operations)		10^7
Max. permitted overtravel force (N)		20
Rest position max. (mm)		12.75
differential travel (mm)		$0.5^{\pm 0.2}$
Ambient operating temperature (°C)		-40 → +85
Contact gap (mm)		0.4 x 2
Weight (g)		14.5

Additional specifications

Components
Material
- Case : polyamide UL94V2
- Contacts : nickel silver

Levers
- Mild steel (zinc)
- Roller : polyamide
- Adjusting screws : self-retaining
- Plates : iridescent passivated mild steel (zinc)

NB : Fixing holes for these microswitches have metal ferrules.

Product adaptations

- Special levers
- Reinforced spring
- Special contacts
- Approvals : UL - cUL

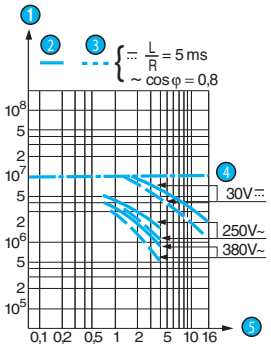
To order, see page 12

Principles

Double break changeover switch

Curves

Operating curve for type 83 112 0

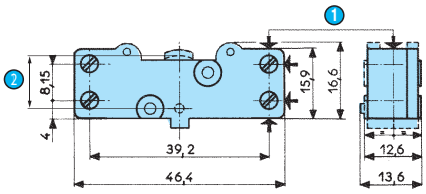


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

➜ Product

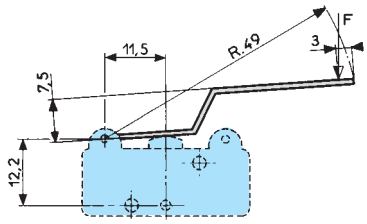
83 112 0



1. Connection
2. OL = 10.65

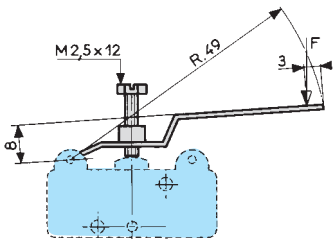
➜ Actuators

A



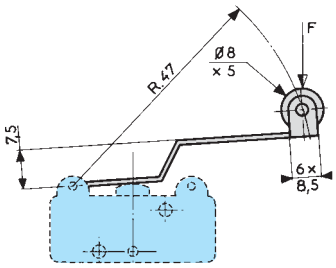
Lever cross-section 1 x 6.4 mm

B



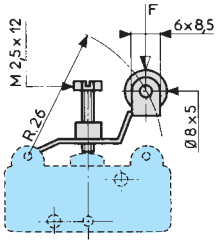
Lever cross-section 1 x 6.4 mm

E



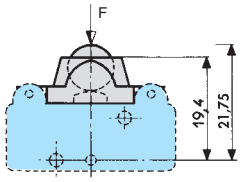
Lever cross-section 1 x 6.4 mm

Q

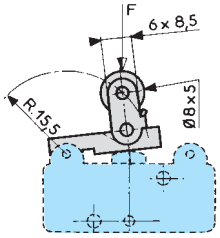


Lever cross-section 1 x 6.4 mm

B9



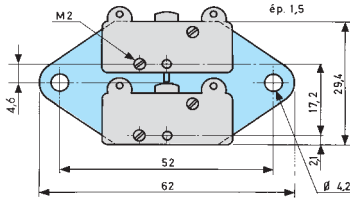
V3



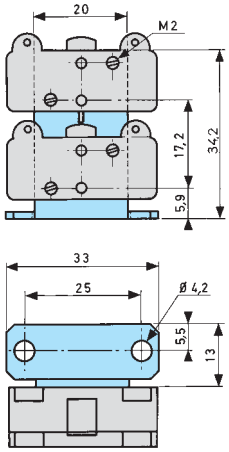
Lever cross-section 1 x 6.4 mm

➜ Mounting accessories

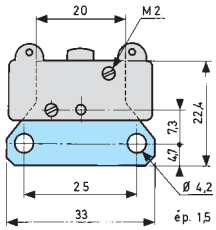
O2
2-pole side mounting plate



K2
2-pole vertical mounting plate



H
Horizontal single-pole mounting plate



Unless indicated, the thickness of plates is 1.5 mm

Actuators and fixing positions

Actuators and fixing positions

Actuators		**A** R49	**B** R47	**E** R47	**Q**	**V3** R15,5	**B9**
							
Operating force - max.	N	1.2	1.2	1.2	2.8	4	4
Release force - min.	N	0.25	0.25	0.2	0.45	0.8	1
Pre-travel - max.	mm	6.2	6.2	6.2	3.2	1.45	1.5
Differential travel	mm	2.1 $^{\pm 0.9}$	2.1 $^{\pm 0.9}$	2.1 $^{\pm 0.9}$	1.05 $^{\pm 0.4}$	0.5 $^{\pm 0.2}$	0.5 $^{\pm 0.2}$
Total travel max.	mm	7.5	8.4	7.5	4.5	1.9	1.9

Except where otherwise indicated, the flat and roller levers are mounted as shown in the dimensional drawings (mounted on the left)..

Mounting accessories

H Horizontal single-pole mounting plate	**O2** 2-pole side mounting plate	**K2** 2-pole vertical mounting plate
		

Other information

Mounting - Operation
See basic technical concepts

Protected

➜ 83 111

- Double break switching
- Rear-fixing via nut or clips
- Options for operation in stable positions
- Choice of actuators and fixing positions

Main specifications

Function	Connections	Rear-fixing with a nut 83 111 0	Rear-fixing with clips 83 111 5
I (changeover)	W1 - W2 - W3	●	●
R (normally closed)	W1 - W2 - W3	●	●
C (normally open)	W1 - W2 - W3	●	●
Electrical characteristics			
Rating nominal / 250 V AC (A)		5	5
Rating thermal / 250 V AC (A)		17.5	17.5
Mechanical characteristics			
Maximum operating force (N)		4	4
Min. Release force (N)		1	1
Tripping point (mm)		$11.45^{+0.2\ -\ 0.25}$	11.45 + 0.2 - 0.25
Min. overtravel (mm)		0.7	0.7
Mechanical life (operations)		10^7	10^7
Max. permitted overtravel force (N)		20	20
Rest position max. (mm)		-	-
Maximum differential travel (mm)		$0.5^{\pm0.2}$	$0.5^{\pm0.2}$
Ambient operating temperature (°C)		- 40 → +85	- 40 → +85
Contact gap (mm)		0.4 x 2	0.4 x 2
Weight (g)		8	8

Additional specifications

Components
Material
- Case : polyamide UL94V2
- Contacts : nickel silver

Levers
- Mild steel (zinc)
- Roller : polyamide
- Adjusting screws : self-retaining
- Plates : iridescent passivated mild steel (zinc)

NB : Fixing holes for these microswitches have metal ferrules.

Product adaptations

- Special levers
- Reinforced spring
- Special contacts
- Approvals : UL - cUL

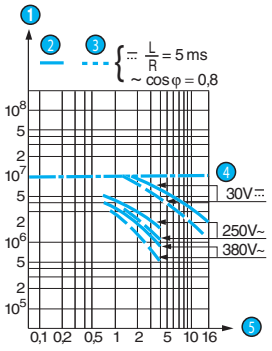
To order, see page 12

Principles

Double break changeover switch

Curves

Operating curve for types 83 111 0 - 83 111 5

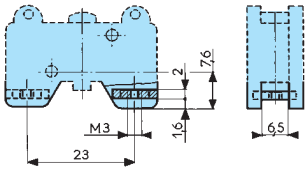


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

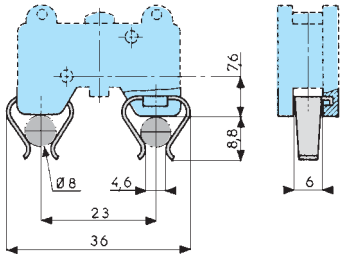
Dimensions

➜ Product

83 111 0

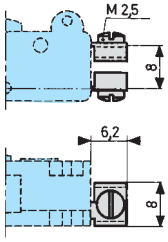


83 111 5

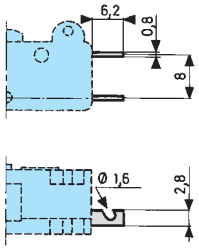


➜ Connections

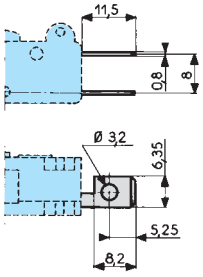
W1 screw



W2 solder

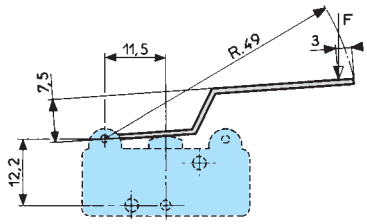


W3 for 6.35 mm clips



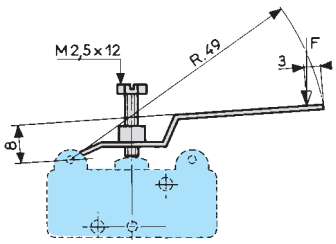
➜ Actuators

A



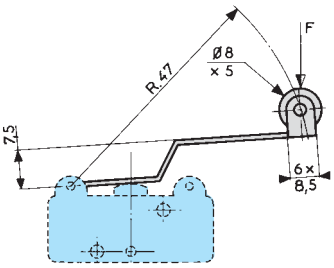
Lever cross-section 1 x 6.4 mm

B



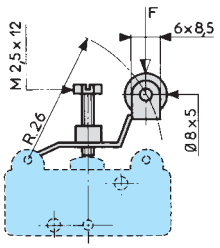
Lever cross-section 1 x 6.4 mm

E



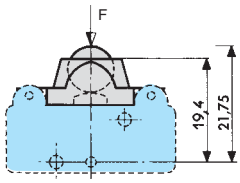
Lever cross-section 1 x 6.4 mm

Q

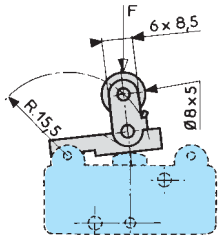


Lever cross-section 1 x 6.4 mm

B9



V3



Lever cross-section 1 x 6.4 mm

1

Actuators and fixing positions

Actuators and fixing positions

Actuators		**A** R49	**B** R47	**E** R47	**Q**	**V3** R15.5	**B9**
Operating force - max.	N	1.2	1.2	1.2	2.8	4	4
Release force - min.	N	0.25	0.25	0.2	0.45	0.8	1
Pre-travel - max	mm	6.2	6.2	6.2	3.2	1.45	1.5
Differential travel	mm	2.1 $^{\pm 0.9}$	2.1 $^{\pm 0.9}$	2.1 $^{\pm 0.9}$	1.05 $^{\pm 0.4}$	0.5 $^{\pm 0.2}$	0.5 $^{\pm 0.2}$
Total travel max.	mm	7.5	8.4	7.5	4.5	1.9	1.9

Except where otherwise indicated, the flat and roller levers are mounted as shown in the dimensional drawings (mounted on the left)..

Other information

Mounting - Operation
See basic technical concepts

Protected

➜ 83 154

- **Double break switching**
- **High DC switch rating**
- **Choice of actuators and fixing positions**

Main specifications

		Magnetic blow-out 83 154 0
Function	**Connections**	
I (changeover)	W1 - W2 - W3	●
R (normally closed)	W1 - W2 - W3	●
C (normally open)	W1 - W2 - W3	●
Electrical characteristics		
Rating nominal / 250 V DC (A)		5
Rating thermal / 250 V DC (A)		17.5
Mechanical characteristics		
Maximum operating force (N)		4
Min. Release force (N)		1
Tripping point (mm)		20
Min. overtravel (mm)		0.7
Mechanical life (operations)		10^7
Max. permitted overtravel force (N)		20
Rest position max. (mm)		-
differential travel (mm)		$0.65^{\pm 0.25}$
Ambient operating temperature (°C)		-40 → +125
Contact gap (mm)		0.5 x 2
Weight (g)		11
Comments		
At 250 VDC 5 A resistive 500.000 cycles		

Additional specifications

Components
Material
- Case : polyamide UL94V0
- Contacts : nickel silver

Levers
- Mild steel (zinc)
- Roller : polyamide
- Adjusting screws : self-retaining
- Plates : iridescent passivated mild steel (zinc)

Product adaptations

- **Special levers**
- **Reinforced spring**
- **Special contacts**
- **Approvals : UL - cUL**

To order, see page 12

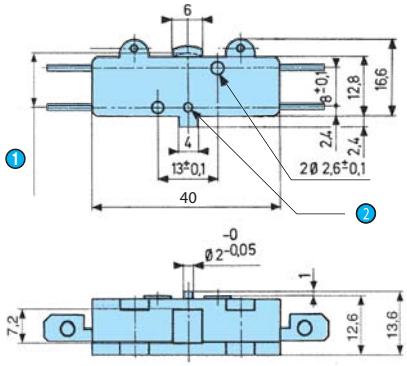
Principles

Single break changeover switch

Dimensions

➜ Product

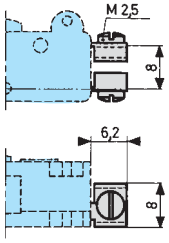
83 154 0



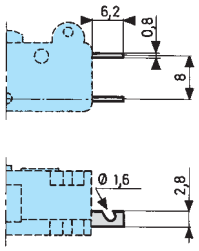
1 OL = 10.65
2 Ø $2^{+0.01}$ $^{+0.65}$ Depth 1.2

➜ Connections

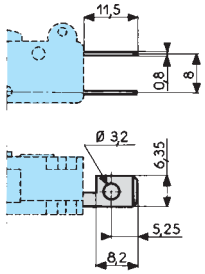
W1 screw



W2 solder

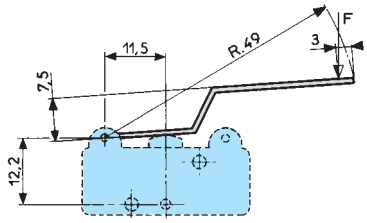


W3 for 6.35 mm clips



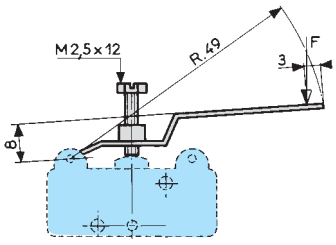
➜ Actuators

A



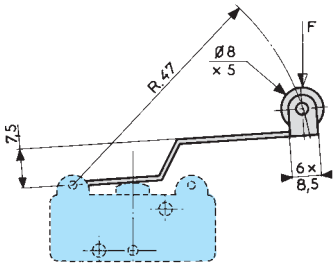
Lever cross-section 1 x 6.4 mm

B



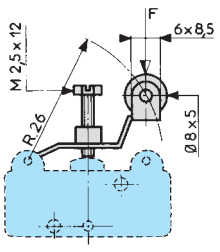
Lever cross-section 1 x 6.4 mm

E



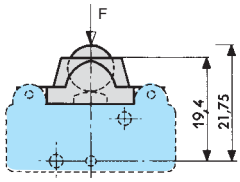
Lever cross-section 1 x 6.4 mm

Q

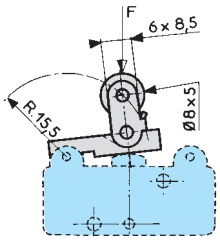


Lever cross-section 1 x 6.4 mm

B9



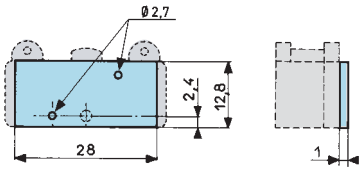
V3



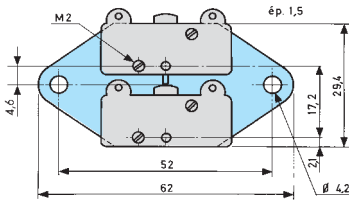
Lever cross-section 1 x 6.4 mm

➜ Mounting accessories

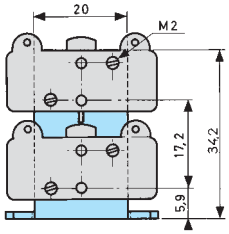
Y
Side plate

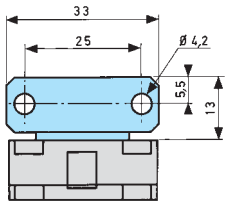


O2
2-pole side mounting plate

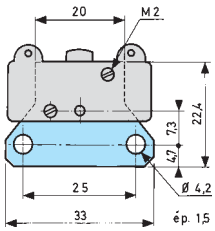


K2
2-pole vertical mounting plate





H
Horizontal single-pole mounting plate



Unless indicated, the thickness of plates is 1.5 mm

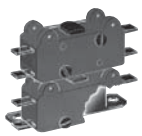
Actuators and fixing positions

Actuators and fixing positions

Actuators		**A** R49	**B** R47	**E** R47	**Q**	**V3** R15.5	**B9**
							
Operating force - max.	N	1.2	1.2	1.2	2.8	4	4
Release force - min.	N	0.25	0.25	0.2	0.45	0.8	1
Pre-travel - max.	mm	6.2	6.2	6.2	3.2	1.45	1.5
Differential travel	mm	2.1 ±0.9	2.1 ±0.9	2.1 ±0.9	1.05 ±0.4	0.5 ±0.2	0.5 ±0.2
Total travel max.	mm	7.5	8.4	7.5	4.5	1.9	1.9

Except where otherwise indicated, the flat and roller levers are mounted as shown in the dimensional drawings (mounted on the left).

Mounting accessories

	Y Side plate	**H** Horizontal single-pole mounting plate	**O2** 2-pole side mounting plate	**K2** 2-pole vertical mounting plate
				

Other information

Mounting - Operation
See basic technical concepts

Protected

➜ 83 118

- Reduced actuation force
- Very short differential travel
- Choice of actuators

Main specifications

		Standard 83 118 0	Reduced force 83 118 S1
Function	**Connections**		
I (changeover)	W1	**83 118 007**	-
I (changeover)	W2 - W3	●	●
Electrical characteristics			
Rating nominal / 250 V AC (A)		5	5
Rating thermal / 250 V AC (A)		17.5	17
Mechanical characteristics			
Maximum operating force (N)		2.7	3
Min. Release force (N)		0.75	30
Tripping point (mm)		$16^{\pm 0.3}$	$16^{\pm 0.4}$
Min. overtravel (mm)		0.2	0.3
Mechanical life (operations)		$5x10^6$	$5x10^6$
Maximum total travel force (N)		4	3
Max. permitted overtravel force (N)		30	30
Rest position max. (mm)		16.7	16.6
differential travel (mm)		0.03 → 0.09	0.03 → 0.09
Ambient operating temperature (°C)		- 40 → +125	- 40 → +125
Contact gap (mm)		0.5	0.5
Weight (g)		21	21

Additional specifications

Components
Material
- Case : thermoset UL94V0
- Contacts : pure silver

Levers
- Flexible stainless steel

Other levers
- Passivated mild steel (zinc) , self-retaining screws

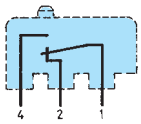
Product adaptations

- Special levers
- Special connections, temperatures
- Approvals : UL - cUL

To order, see page 12

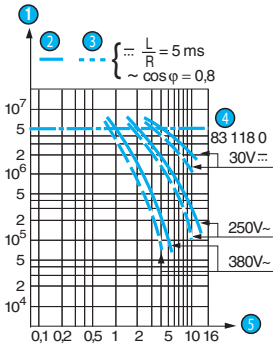
Principles

Single break changeover switch



Curves

Operating curve for types 83 118 0 - 83 118 S1

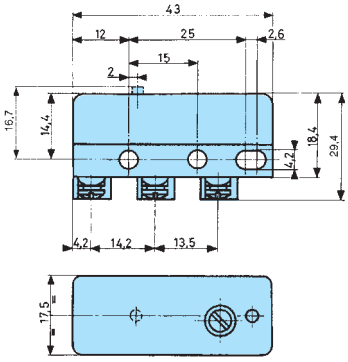


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

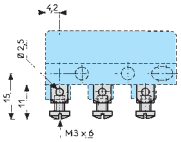
➜ Product

83 118 0/83 118 S1

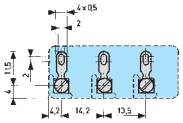


➜ Connections

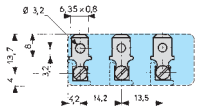
W1 screw



W2 solder

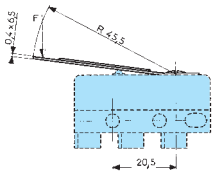


W3 for 6.35 mm clips

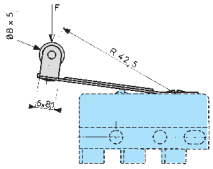


➜ Actuators

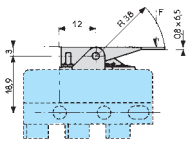
52A



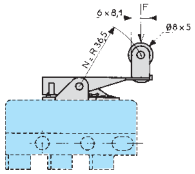
52B



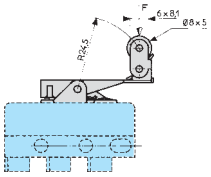
52M



52N

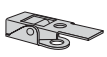
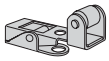
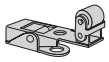
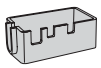


52V



Actuators and fixing positions

Part numbers for actuators

Flexible direct-acting actuators: 52A - 52B Hinged reverse-action actuators: 52M - 52N - 52V		**52A** R45.5	**52B** R42.5	**52M** R38	**52N** R36.5	**52V** R24.5	**70 520 029**
							
		83 118 0	83 118 S1	83 118 0	83 118 S1	83 118 0	83 118 S1
Operating force - max.	N	2.5	1.4	0.85	1.5	1.4	2.5
Release force - min.	N	0.8	0.55	0.27	0.4	0.4	0.6
Pre-travel - max.	mm	4.5		2		1.5	
Differential travel	mm	$0.45^{\pm 0.25}$		$0.3^{\pm 0.15}$		$0.16^{\pm 0.09}$	
Total travel max.	mm	7		10		5	

Other information

Mounting - Operation
See basic technical concepts

Sealed

➜ 83 139

- IP 67 protection against hydrocarbons, detergents
- Double break switching
- Double insulated or Atex flameproof casing
- Choice of actuators



Main specifications

Function	Connections	Standard 83 139 0	Low temperature 83 139 5	Double insulated 83 139 2	Flameproof 83 139 1
I (changeover)	Standard lead output	83 139 003	●	-	●
I (changeover)	Lead output on right/left	●	●	-	●
I (changeover)	Cable output	-	-	●	-
Electrical characteristics					
Rating nominal / 250 V AC (A)		6	6	6	6
Rating thermal / 250 V AC (A)		11	11	11	11
Mechanical characteristics					
Maximum operating force (N)		3	3	3	0.25
Min. Release force (N)		0.6	0.6	0.6	5×10^6
Maximum total travel force (N))		4	4	4	4
Max. permitted overtravel force (N)		10	10	10	10
Rest position max. (mm)		A= 8.8 B= 9.8	A=8.8 B=9.8	B=9.8	B = 9.8
Tripping point depending on position of fixing holes (mm)		A = $7.7^{\pm 0.4}$ B = $8.7^{\pm 0.4}$	A=$7.7^{\pm 0.4}$B=$8.7^{\pm 0.4}$	B = $8.7^{\pm 0.4}$	B = $8.7^{\pm 0.4}$
Maximum differential travel (mm)		0.35 ±0.1	0.35 ±0.1	0.35 ±0.1	0.35 ±0.1
Min. overtravel (mm)		0.25	0.25	0.25	3
Ambient operating temperature (°C)		0 → +85	-20 → +85	-20 → +85	-20 → +85
Mechanical life (operations)		10^7	5×10^6	5×10^6	0.6
Contact gap (mm)		0.3 x 2	0.3 x 2	0.3 x 2	0.3 x 2
Weight (g)		37	37	45	37
Fixations					
Fixings - 4 holes (standard)		A	A	-	-
Fixing - 2 holes		B	B	B	B
Connections					
Connection		4 flexible leads 0.75 mm² length 0.50 m Ø ext. 2.3 mm	4 flexible leads 0.75 mm² Ø ext. 2.3 mm	Cable 3 x 0.75 mm² length 0.50 m Ø ext. 5.2 mm	4 flexible leads 0.75 mm² length 0.50 mm Ø ext. 2.3 mm
Standard wire output		S	S	-	S
Wire output on right		D	D	-	D
Wire output on left		G	G	-	G
Comments					

Components
Material
- Case : polyester UL94V0
- Contacts : silver
- Membrane : nitrile for 83 139 0 silicon for 83 139 1/2/5

Levers
- stainless steel
- Roller : polyamide

Characteristics specific to 83 139 1
- Conform to standards EN 50 014 and 50 018
- Conform to the European directive 94/9/EC concerning potentially explosive atmospheres
- Group II classified for potentially explosive atmospheres other than mines subject to firedamp
- Temperature class T6, max. surface temperature 85°C
- CE Test Certificate type n° LCIE 02 ATEX 0034 U
- Notification number : LCIE 03 ATEXQ8002

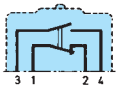
Product adaptations

- Special levers
- Special leads, cables, cable harnesses
- Specific operating temperatures

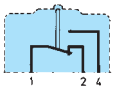
To order, see page 12

Principles

Double break changeover switch
Types 83 139 0 / 83 139 1/ 83 139 5

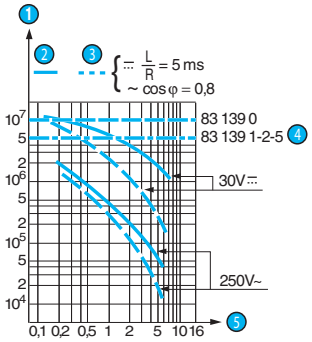


Single break changeover switch
Type 83 139 2



Curves

Operating curve for types 83 139 0 / 1 / 2 / 5

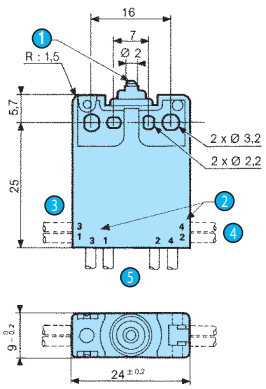


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

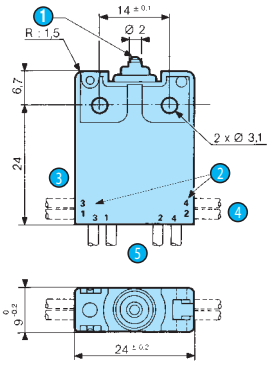
➜ Product

83 139 0 - 5
A fixing = 4 holes



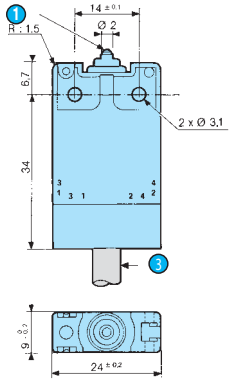
1. R : 1.5 spherical
2. Lead reference on casing
3. Lead output on left
4. Lead output on right
5. Standard lead output (black)
   1 = black lead
   2 = brown lead
   3 = grey lead
   4 = blue lead

83 139 0 - 1 - 5
B fixing = 2 holes



1. R : 1.5 spherical
2. Lead reference on casing
3. Lead output on left
4. Lead output on right
5. Standard lead output (black)
   1 = black lead
   2 = brown lead
   3 = grey lead
   4 = blue lead

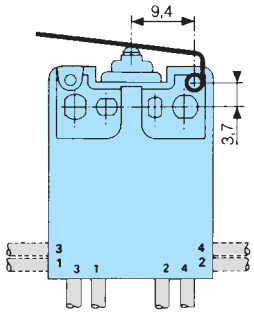
83 139 2
B fixing = 2 holes



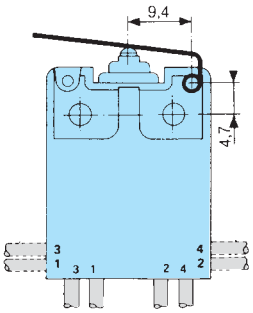
1. R : 1.5 spherical
3. Cable 3 x 0.75 mm² length 0.50 m
   1 = black lead
   2 = brown lead
   3 = blue lead

➜ Actuator mounting positions

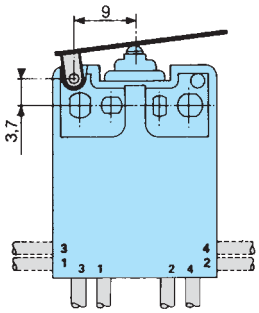
Type 139
A fixing = 4 holes



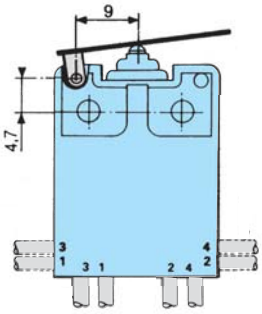
Type 139
B fixing = 2 holes



Type 161
A fixing = 4 holes

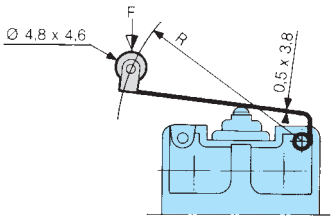


Type 161
B fixing = 2 holes

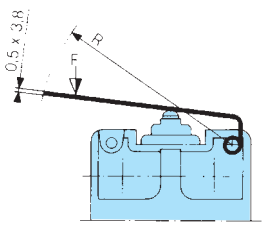


➜ Actuators

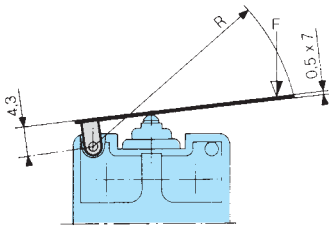
139 EX



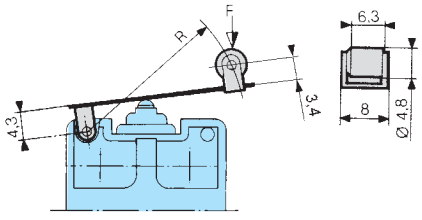
139 AX



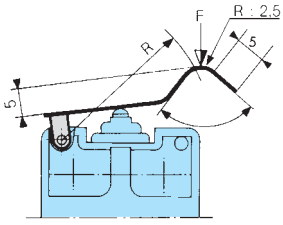
161 A



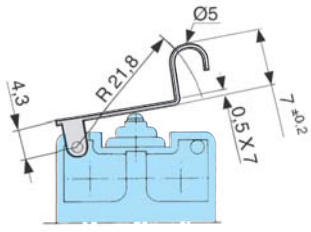
161 E



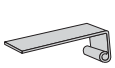
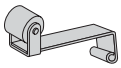
161 F



161 G



Actuators and fixing positions

Part numbers for standard actuators				79 215 740	70 507 524	79 215 742	70 507 529
Actuators		Flat **139 AX** R29.7 mm**	Roller **139 EX** R28.7 mm**	Flat **161A** R14.2 - R25.4 mm		Roller **161E** R13.6 - R24.1 mm	
							
Operating force - max.	N	1.5	1.5	2.6	1.7	2.6	1.7
Release force - min.	N	0,2	0.35	0.2	0.35	0.2	
Differential travel	mm	1.5	0.7	1.25	0.7	1.2	

Part numbers for standard actuators		70 507 528	79 218 651
Actuators		Flat **161F** R22.3 mm	Dummy roller **161 G** R21.8
			
Operating force - max.	N	2	2
Release force - min.	N	0.2	0.2
Differential travel	mm	1.1	1.1

Unless indicated, flat actuators and roller actuators are delivered unmounted.
** Factory fitted

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

Other information

Product marking (83 139 1)
II 2 G
EEx d IIC T6

Key to these symbols :
- Equipment used in potentially explosive atmospheres
II - Equipment group for surface use
2 - Equipment category for zone 1
G - Gas

EEx - The equipment complies with the protection methods standardised by CENELEC (European standards)
d - Protection method used : "d" flameproof casing
II - Surface industry
C - Most severe gas subdivision including hydrogen, acetylene and carbon disulphide
T6 - Temperature class corresponding to +85°C

At the time of ordering, the customer must specify :
- The operating zone (0, 1 or 2)
- The type of atmosphere (gas or dust)
- The type of gas
- The ambient operating temperature

Sealed

➜ V3 Sealed

- IP 67 protection
- Nominal ratings 0.1 A to 10 A/250 VAC
- Minimum rating 1 mA/4 VDC
- Reduced differential travel
- Choice of actuators

Main specifications

Function	Connections	Standard 83 169 0	Reduced differential travel 83 169 4	Dual-current 83 169 8	Dual-current reduced differential travel 83 169 9
I (changeover)	Lead output on right	83 169 002	●	●	●
I (changeover)	Lead output on left or cable output	●	●	●	●
Electrical characteristics					
Rating nominal / 250 V AC (A)		8	5	0.1	0.1
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. permitted overtravel force (N)		20	20	20	20
Rest position max. (mm)		15.9	15.9	15.9	15.9
Tripping point (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 (°C)		-20 → +85 °C	-20 → +85 °C	-20 → +85 °C	-20 → +85 °C
Mechanical life (operations)		5 x 10^6	5 x 10^6	5 x 10^6	5 x 10^6
Contact gap (mm)		0.4	0.4	0.4	0.4
Weight (g)		30	30	30	30
Connections					
Wire output on right		D	D	D	D
Wire output on left		G	G	G	G
Cable output		C	C	C	C
Leads connection		Flexible PVC leads 1 mm² length 0.50 m, Ø ext. 2 mm	Flexible PVC leads 1 mm² length 0.50 m, Ø ext. 2 mm	Flexible PVC leads 1 mm² length 0.50 m, Ø ext. 2 mm	Flexible PVC leads 1 mm² length 0.50 m, Ø ext. 2 mm
Cable connection		PVC 3 x 0.75 mm² length 0.50 m, Ø ext. 5 mm	PVC 3 x 0.75 mm² length 0.50 m, Ø ext. 5 mm	PVC 3 x 0.75 mm² length 0.50 m, Ø ext. 5 mm	PVC 3 x 0.75 mm² length 0.50 m, Ø ext. 5 mm

Additional specifications

Components
Material
- Case : polyester UL 94 VO
- Contacts : silver/nickel - gold alloy (dual-current)
- Membrane : fluoro-silicon

Levers
- stainless steel
- Roller : polyamide
- Plunger : stainless steel

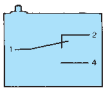
Product adaptations

- Special levers
- Special leads, cables, cable harnesses
- Approval : UL - cUL

To order, see page 12

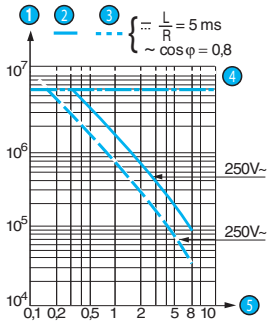
Principles

Single break changeover switch



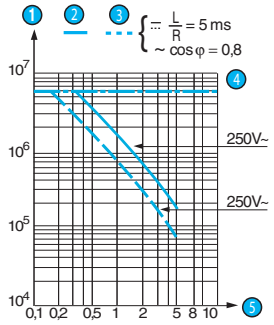
Curves

Operating curve for type 83 169 0



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

Operating curve for type 83 169 4



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

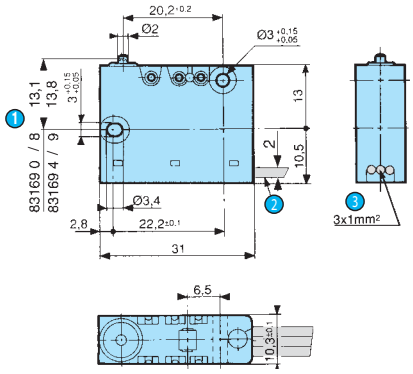
83 169 8 and 83 169 9 dual-current

These models are designed to operate equally well on dual-current (1 mA 4 V minimum) 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

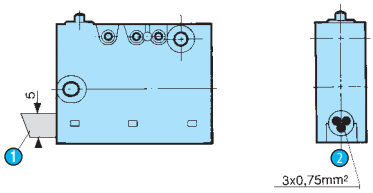
➜ Product

Lead output



1. OL = 13.1
2. Right output
3. Lead 1 mm²
   1 = black lead (common)
   2 = brown lead (NC)
   4 = blue lead (NO)

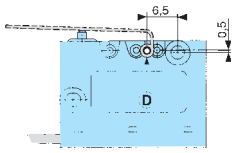
Cable output



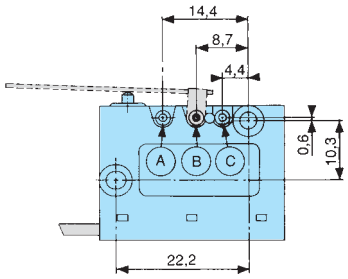
1. Left output
2. Cable 3 x 0.75 mm²
   1 = black lead (common)
   2 = brown lead (NC)
   4 = blue lead (NO)

➜ Actuator mounting positions

Levers type 139

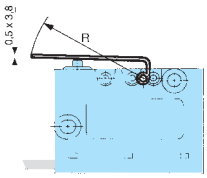


Levers type 161

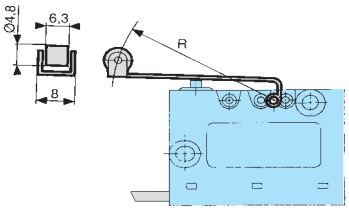


➜ Actuators

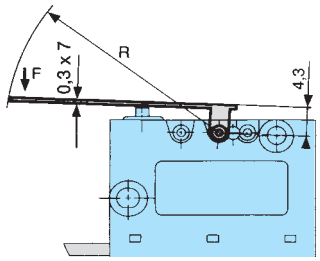
139 AX



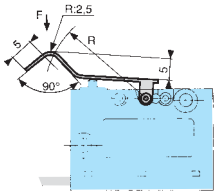
139 EX



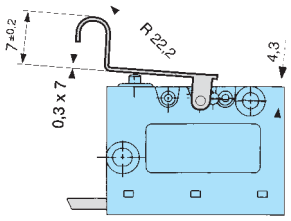
161 A



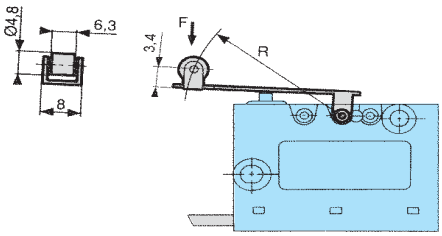
161 F



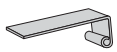
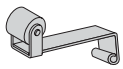
161 G



161 E



Actuators and fixing positions

Part numbers for standard actuators				79 215 740		79 507 524			79 215 742		79 507 529		
Actuators		Flat **139 AX** R29.7 mm**	Roller **139 EX** R28.7 mm**	Flat **161A** R14.2* - R25.4 mm*					Roller **161E** R13.6* - R24.1 mm*				
													
Fixing position		D	D	A	B	A	B	C	A	B	A	B	C
Operating force - max.	N	2.5	2.5	2.5	4.2	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
Differential travel	mm	1.2 - 0.5	1.2 - 0.5	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		70 507 328		79 218 651	
Actuators		Flat **161F** R22.3 mm*		Dummy roller **161 G***	
					
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
Differential travel	mm	16	0.8	16	0.8

Unless mentioned specifically, flat and roller levers are supplied unassembled.
* For factory mounting, specify mounting position A, B or C..
** Supplied factory fitted

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

Other information

Mounting - Operation
See basic technical concepts

Sealed

➜ 83 123

- **IP 66 protection**
- **Compact dimensions**

Main specifications

Function	Connections	Standard 83 123 0	Spherical cover 83 123 0
I (changeover)	A05 VVF cable	●	●
Electrical characteristics			
Rating nominal / 250 V AC (A)		5	5
Rating thermal / 250 V AC (A)		12	12
Mechanical characteristics			
Maximum operating force (N)		7.5	7.5
Min. Release force (N)		1.5	1.5
Maximum total travel force (N)		8	8
Max. permitted overtravel force (N)		30	30
Tripping point (mm)		$11.4^{\pm 0.4}$	$16.5^{\pm 0.5}$
Maximum differential travel (mm)		0.2	0.25
Min. overtravel (mm)		0.25	0.2
Ambient operating temperature (°C)		0 → +85	0 → +85
Mechanical life (operations)		2 x 10^6	2 x 10^6
Contact gap (mm)		0.5	0.5
Weight (g)		45	50
Connections			
Connection		Cable 3 x 0.75 mm² in sheath Ø ext. 7.6 mm max. Standard length 0.50 m	Cable 3 x 0.75 mm² in sheath Ø ext. 7.6 mm max. Standard length 0.50 m
Comments			
Common (1) : black Normally closed (2) : brown Normally open (4) : grey			

Additional specifications

Components
Material
- Casing : nitrile
- Contacts : silver
- Contact holder : polyamide
- Mounting plate : passivated mild steel (zinc)

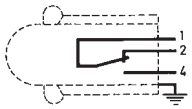
Product adaptations

- **Special casing, leads, cables for specific environment**

To order, see page 12

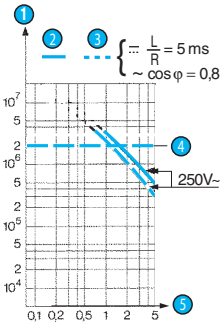
Principles

Double break changeover switch



Curves

Operating curve

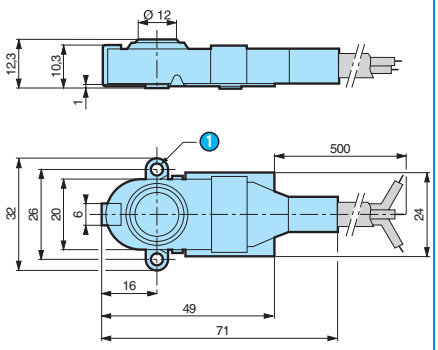


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

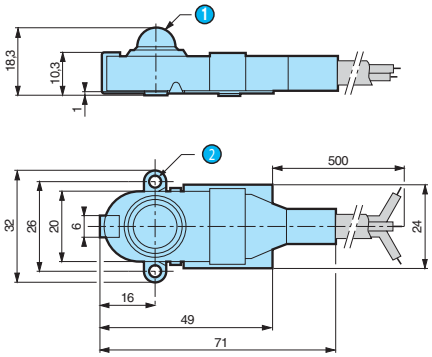
➜ Product

83 123 Standard



1. 2 holes Ø 3.2

83 123 Spherical cover



1. R6 spherical
2. 2 holes Ø 3.2

Other information

Mounting - Operation

In order to comply with basic safety requirements, an insulator must be used if the device is being operated manually.
One of the fixing holes must be used as a protective earth.

Sealed

➜ V4 Sealed

- IP 67 protection
- Nominal ratings 0.1 A to 10 A/250 VAC
- Minimum rating 1 mA/4 VDC
- Operating temperature -40°C to +125°C
- Choice of actuators with 2 possible fixing positions

Main specifications

Function	Connections	High-current 83 180	Dual-current 83 181	Medium current 83 183	Standard 83 186
I (changeover)	W2S	●	●	●	83 186 001
I (changeover)	W7S	●	●	●	83 186 002
I (changeover)	FD0	●	●	●	83 186 003
I (changeover)	X1A* - X1S* - X2A* - X2S* - X3A* - X3S* - FB0 - FG0 - CD0** - CB0** - CG0**	83 180 0	83 181 0	83 183 0	83 186 0
R (normally closed)	W2S - W7S - FD0 - FB0 - FG0 - CD0** - CB0** - CG0**	83 180 6	83 181 6	83 183 6	83 186 6
C (normally open)	W2S - W7S - FD0 - FB0 - FG0 - CD0** - CB0** - CG0**	83 180 8	83 181 8	83 183 8	83 186 8
Electrical characteristics					
Rating nominal / 250 V AC (A)		10	6	3	6
Rating thermal / 250 V AC (A)		12.5	7.5	4	7.5
Mechanical characteristics					
Maximum operating force (N)		3.4	2.5	2.5	2.5
Min. Release force (N)		1	0.8	0.8	0.8
Maximum total travel force (N)		5	4.2	4.2	4.2
Max. permitted overtravel force (N)		10	10	10	10
Maximum rest position (mm)		9.3	9.3	9.3	9.3
Tripping point (mm)		8.4 $^{\pm 0.3}$	8.4 $^{\pm 0.3}$	8.4 $^{\pm 0.3}$	8.4 $^{\pm 0.3}$
Maximum differential travel (mm)		0.1	0.1	0.1	0.1
Min. overtravel (mm)		0.6	0.6	0.6	0.6
Ambient operating temperature for blade version (°C)		-40 → +125	-40 → +125	-40 → +125	-40 → +125
Ambient operating temperature for wires/cable version (°C)		-40 → +105	-40 → +105	-40 → +105	-40 → +105
Mechanical life (operations)		10^6	$2x10^6$	$2x10^6$	$2x10^6$
Contact gap (mm)		0.4	0.4	0.4	0.4
Weight (tag version) g		2	2	2	2
Comments					

* Type 83 180 available on request
** Cable version for types 83 181, 83 183 and 83 186

Additional specifications

Components
Material
- Case : polyester UL 94VO
- Button : polyester
- Membrane : silicon
- Contacts : AgCdO or AgSnO2
gold-plated AgNi (dual-current)
- Terminals : silver-plated, tinned brass
- Cable/Lead : PVC

Levers
- Flat : stainless steel
- Roller : stainless steel, polyamide roller

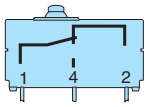
Product adaptations

- Special levers
- Specific fixings
- Special leads, cables, cable harnesses
- NF - UL - cUL approvals

To order, see page 12

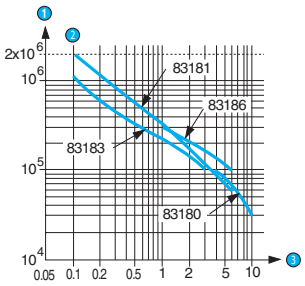
Principles

Single break changeover switch



Curves

Operating curve 250 VAC



1. Number of cycles
2. Resistive circuit
3. Current in Amps

Switch rating with DC supply

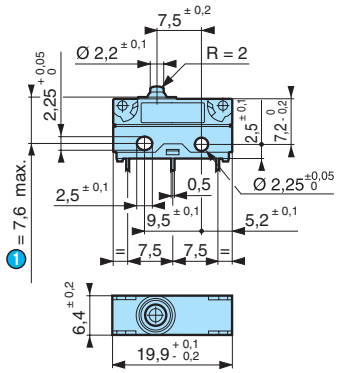
		83 180	83 181	83 183	83 186
12 V	Resistive	10 A	6 A	3 A	6 A
	Inductive L/R 5 ms	10 A	6 A	3 A	6 A
24 V	Resistive	10 A	6 A	3 A	6 A
	Inductive L/R 5 ms	5 A	5 A	3 A	5 A

Model 83 181 is designed to operate equally well on dual-current (1 mA 4 V minimum) or medium-current (6 A maximum) circuits. However, a given product should only be used to switch one type of circuit during its working life.

Dimensions

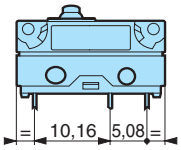
➜ Product

Symmetrical version
types 83 180 / 181 / 183 / 186



1. OL = 7.6 max.

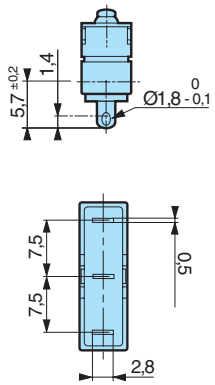
Asymmetrical version
types 83 180 / 181 / 183 / 186



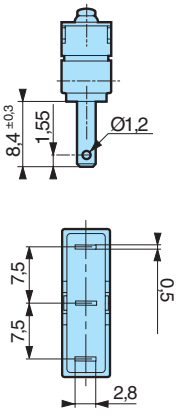
Fixed by 2 M2 screws
Torque with screw only : 0.2 Nm, with screw + washer : 0.3 Nm

➜ Connections

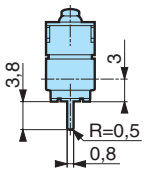
W2S
Solder



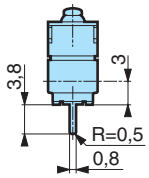
W7S
Faston 2.8 x 0.5



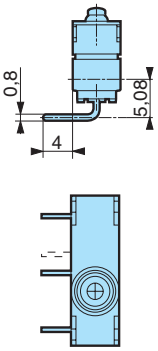
X1A
Straight PCB output



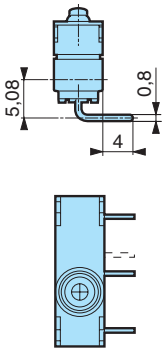
X1S
Straight PCB output



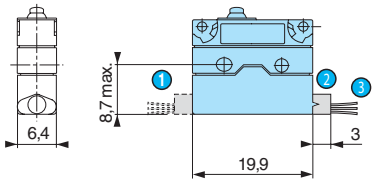
X2A - X2S
Side outputs, PCB rear



X3A - X3S
Side outputs, PCB front



Lead outputs

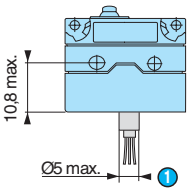


1. FG0
2. FD0
3. Standard 500 mm

Black = Common
Grey = NC
Blue = NO

Conductor cross-section :
83181 / 83 183 / 83 186 = 0.5 mm²
83 180 = 0.75 mm²

Lead/cable output
CB0 cable output on bottom

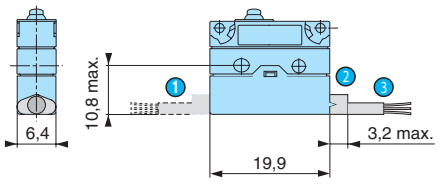


1. Standard 500 mm

Black = Common
Grey = NC
Blue = NO

Conductor cross-section :
83181 / 83 183 / 83 186 = 0.5 mm²
83 180 = 0.75 mm²

Cable outputs



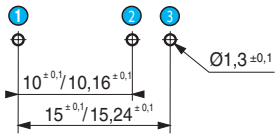
1. CG0
2. CD0
3. Standard 500 mm

Black = Common
Grey = NC
Blue = NO

Conductor cross-section :
83181 / 83 183 / 83 186 = 3 x 0.5 mm²

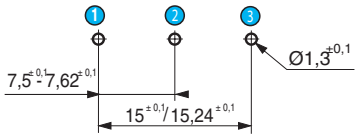
➜ Drilling

Printed circuit board mounting
Asymmetrical
X1A, X2A, X3A



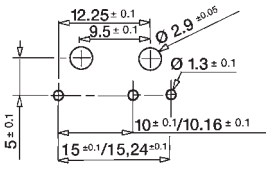
1. 1.C
2. 4.NO
3. 2.NO

Printed circuit board mounting
Symmetrical
X1S, X2S, X3S

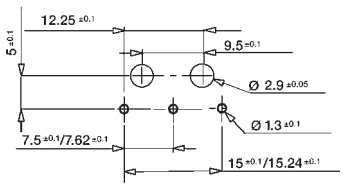


1. 1.C
2. 4.NO
3. 2.NO

Mounting on a printed circuit board
with fixing pins
Asymmetrical

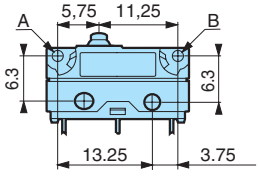


Mounting on a printed circuit board
with fixing pins
Symmetrical



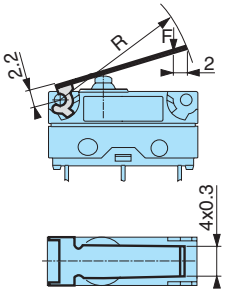
➜ Actuator mounting positions

Fixing position

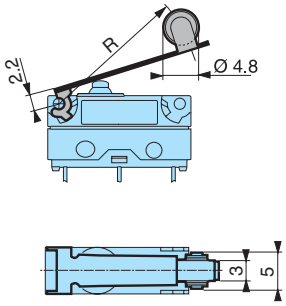


➜ Actuators

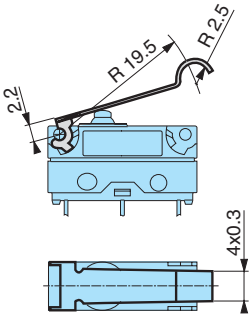
170 A
Flat



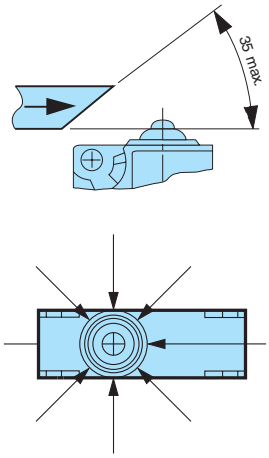
170 E
Roller



170 F
Dummy roller

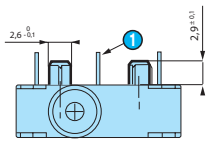


Recommendations for operation from the side



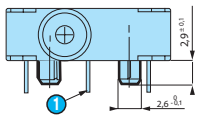
➜ Mounting accessories

Fixing pins



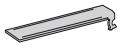
1 X2 output

Fixing pins

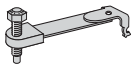
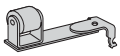


1 X3 output

Actuators and fixing positions

Part numbers for standard actuators	79 253 327	79 253 326		79 218 454
Actuators	Flat **170A** R18.3	Flat **170A** R24	Flat **170A** R41	Roller **170E** R20
				

Mounting position	A	B	A	B	A	B	A	B
Coefficient	3	1.5	4	2	7	3.5	3	1.5
Tripping point	10 $^{\pm 1,4}$	9.2 $^{\pm 0,9}$	10.7 $^{\pm 1,7}$	9.6 $^{\pm 1}$	12.7 $^{\pm 3}$	10.6 $^{\pm 1,8}$	15.5 $^{\pm 1,4}$	14.5 $^{\pm 0,9}$
83 180					11 $^{\pm 3}$	8.8 $^{\pm 1,8}$		
83 181 / 183 / 186					11.4 $^{\pm 3}$	9.3 $^{\pm 1,8}$		

Part numbers for standard actuators	79 253 329		
Actuators	Dummy roller **170F** R19.5	Screw **170D** *	Transverse roller **170 EL** *
			

Mounting position	A	B
Coefficient	3	1.5
Tripping point	12.9 $^{\pm 1,5}$	11.9 $^{\pm 1,1}$

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

Other information

Mounting - Operation
See basic technical concepts

Degree of protection
- Tag version :
  → casing = IP67
  → terminals = IP00
- Lead/cable version :
  → output/casing = IP67

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

Limit switches

Limit switches

Limit switch selection guide

General purpose limit switches

Standard range " Series 83 840 0 ": Snap action with metal body

Plunger / roller plunger	Roller lever	Adjustable roller lever	Rotary head	Wobble
				
104	104	104	105	105

Positive break "Series 83 840 7": Snap-action with metal body

Plunger / roller plunger	Roller lever	Adjustable roller lever	Rotary head
			
108	108	109	109

Limit switches compliant with EN 50047

Series 83 850: Dependent or snap-action with metal or double insulated thermoplastic body

Plunger / roller plunger	Roller lever	Adjustable roller lever	Special levers
			
112	114	116	118

Manual reset "Series 83 854": Dependent action with metal or thermoplastic body

Plunger / roller plunger	Roller lever	Adjustable roller lever
		
120	122	124

Legend

Dependent action: the effect is dependent upon the actuating speed (for resistive circuits, precision release, high power).
Snap-action: the effect is independent of the actuation. Maintains the speed of displacement and the force on the contacts (for capacitive circuits, differential travel needs).

Positive break: ensures the opening of the contacts when the actuators is operated.

Limit switch selection guide

Limit switches compliant with EN 50041

Cable pull operated with manual reset "Series 83 863": Dependent action with metal body

Series 83 861: Dependent or snap-action with metal body

Plunger / roller plunger	Roller lever	Adjustable roller lever	Special levers	Cable pull
				
130	128	132	134	136

Compact limit switches compliant with NFC 63145

Standard Series 83 870: Snap-action with metal body, 20 mm pitch mounting holes		**Short-travel Series 83 870:** Snap-action with metal body, 20 mm pitch mounting holes		**Series 83 880:** Snap-action with metal body, 25 mm pitch mounting holes
Cable output	Connector output	Cable output	Connector output	Cable output
				
141	144	148	148	152

Special limit switches

Series 83 581	Series 83 589	Series 83 731 / 732 / 733	Series 83 800
Protected	Harsh environment	Precision	Miniatures
			
156	158	160	162

Safety limit switches

Series 83 893: Dependent action with plastic body			**Series 83 894:** Dependent action with metal body	
Key-operated without interlocking	Key-operated with interlocking	Rotating lever/shaft	Without interlocking	With interlocking
				
166	168	172	174	176

Basic technical principles

Introduction

What is meant by a «position detector» is any device which needs to be operated by a member which exerts a physical force, in view of:

- either the form which its operating device takes
- or the considerable force needed to operate it.

The distinguishing features of position detectors are:

- their high electrical performance capability
- their excellent resistance to accidental impact
- good protection against splashed or dripping wate
- a wide range of operating devices to allow the detectors to be adapted to a vast variety of mechanisms.

Construction

Our detectors are designed to conform to international IEC recommendations and/or European standards (EN).
Proof that a detector conforms to these standards or recommendations takes the form of a conformity declaration made by the manufacturer (drafted as indicated in guidance document ISO/IEC 22 - EN 450-14).
Characteristics in line with the general requirements of standards NFC 63140, IEC/EN 60947-5-1.
- Leakage paths and air gaps : IEC 60664.1 - NFC 20-040.
Our position detectors which comply with IEC/EN 60947-5-1. can be fitted to machine-tools and industrial machines complying with NFC 79130, IEC/EN 60204.1 or VDE 113.

Electrical characteristics

➜ Assigned working current (Ie):

The current level adopted as a basis for the operating conditions quoted for a detector, and for the life tests on it.

➜ Thermal rating (Ith):

The current the microswitch will withstand when not being operated electrically, for a temperature rise of not more than 60 °C.

➜ Assigned insulation voltage (Ui):

The voltage adopted as a reference for the dielectric tests and leakage paths. It must be equal to or greater than the assigned working voltage.

➜ Categories of use (IEC/EN 60947-5-1):

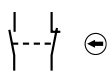
- AC 15 for operating AC solenoids and electromagnets
- DC 13 for operating DC solenoids and electromagnets.

➜ Contact element designation (IEC/EN 60947-5-1):

A letter and number which define the use category and the assigned working voltage and current.
For example, A 300 means : in category AC 15, a maximum working voltage of 300 V, 6 A at 120 V or 3 A at 240 V.

➜ Contact block electrical wiring diagram:

Form Zb

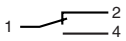


The 2 contacts are electrically isolated

Form Za

Both contacts have the same polarity

Change over

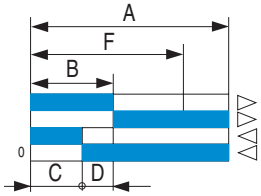


➜ Positive break contact operation (IEC/EN 60947-5-1, appendix K)

For contacts used in safety applications, limit switches and emergency stop devices, reliable opening is essential (see IEC, EN 60204). After a short-circuit closing test, the opening of the contact is checked by means of an impulse voltage test (2500 V).

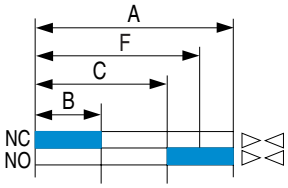
➜ Contact element

Snap action contact
This is characterised by separate tripping and release points. The speed at which the contacts move is independent of the speed of the control device. This feature ensures satisfactory electrical performance even if the control device is moving slowly.



A : *Total travel (TT) of the control device*
B : *Pre-travel (PT) up to opening of the contact element*
C : *Release travel of the contact element*
D : *Differential travel (DT)*
F : *Travel necessary to reach the positive opening position (POT)*

Slow action contacts
The opening and closing speed of the contacts is dependent on the speed of the control device.
The operating positions are identical in both directions of travel, there is no differential travel.



A : *Total travel (TT) of the control device*
B : *Pre-travel (PT) and release travel (RT) of the N/C contact*
C : *Pre-travel and release travel of the N/O contact*
F : *Travel necessary to reach the positive opening position (POT)*

Rules and regulations

➜ EC Directives

Our detectors conform to the EC Low Voltage Technical Directive 73/23/EEC and can be used in accordance with the specifications of the Machinery Directive 89/392/EEC.

Environmental conditions

➜ Temperature limits

When they are used in the temperature range quoted, the mechanical and electrical characteristics of our position detectors will remain substantially unchanged. If you intend to use them outside this range, please consult us.

➜ Protective treatment

The treatment given to our position detectors is suitable in the vast majority of applications.
Parts made of steel are zinc-coated or painted according to their mechanical function. Further information is available on request.
This treatment allows our detectors to be used under the following temperature and humidity conditions:

T° C	20	40	50
Relative humidity %	95	80	50

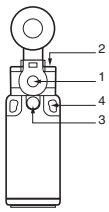
This treatment may thus be suitable for applications in tropical or equatorial climates where the equipment concerned is in an interior location sheltered from direct exposure to atmospheric conditions.
Other types of reinforced protection are possible for resistance to very severe environments. Please enquire.

➜ Mounting requirements

Electric shock protection.

The user should observe the mounting instructions relating to the mode of protection against electric shocks defined in the IEC/EN60 536.1 - EN 60204.1 - NFC 20030 standards:
Class I: earth circuit link. Protection via differential circuit-breaker.
Class II: double insulation.
Class III: very low safety voltage.

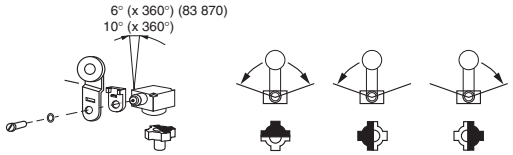
➜ Screw tightening torque:



1: Actuator tightening	**1.2 to 1.5 Nm**	
	Plastic body	*Metal body*
2: Head fixing screw	**0.7 to 0.8 Nm**	**0.8 to 1 Nm**
3: Body fixing screw	**0.7 to 0,8 Nm**	**0.8 to 1 Nm**
4: Fixing screw	**2 to -2.5 Nm**	

➜ Adjustment of rotary heads with momentary action to right and left:

For series:
83 850
83 851
83 854
83 855
83 861
83 863



➜ Degree of protection

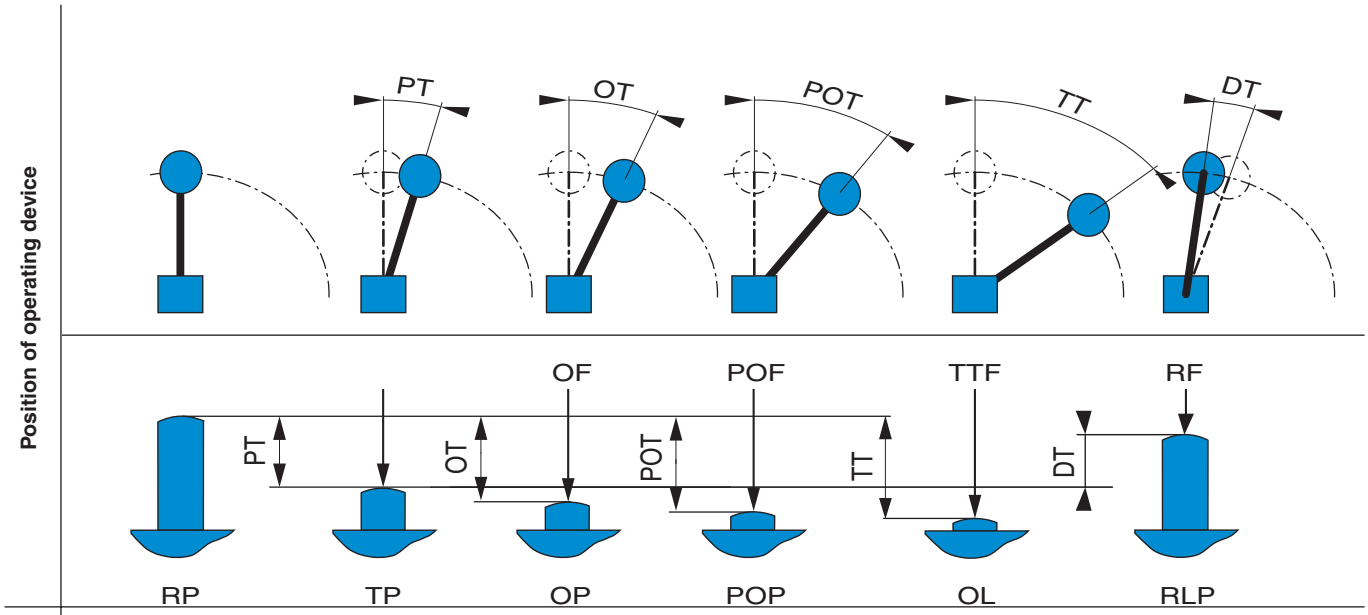
Under the IEC 529 or NFC 20010 classification scheme, standards employ an IP code to define the degree or class of protection which a position detector provides against access to live components and against the entry of solid foreign bodies and the entry of water.

1st numeral		
	Protection equipment provides against the entry of solid foreign bodies	*Protection for persons against access to dangerous parts*
0	(not protected)	(not protected)
4	diameter ≥ 1 mm	1 mm Ø wire
5	protected against dust	1 mm Ø wire
6	sealed against dust	1 mm Ø wire

2nd numeral			
Protection equipment provides against the entry of water			
0	(not protected)	**6**	high-pressure hosed water
4	splashed water	**7**	temporary immersion
5	hosed water	**8**	prolonged immersion

Terminology

➜ Forces - Positions - Travel



Forces

		OF Operating force	POF Positive opening force	TTF Total travel force	RF Release force
		Force which must be applied to the operating device to displace the rest position RP to the tripping point TP.	Operating force applied to the operating device to cause the positive opening action to take place.	Force applied to the operating device to move it through its total travel.	Level to which the operating force OF must be reduced to allow the mechanism to return to its release position RLP.

Positions

RP Rest position	TP Tripping point	OP Operating point	POP Positive opening point	OL Overtravel limit	RLP Release position
Position of the operating device when no external mechanical force is applied. Also described as «height at rest».	Position of the operating device in relation to its mounting (hole, face) at the moment when an operating force causes the snap action of the mechanism to trip.	Position of the operating device when the applied force has moved it to the point on its travel where mechanical and electrical operation of the detector can be relied on to occur.	Position of the operating device at the moment when a force produces the positive opening action.	Position of the operating device when the force applied has brought it to the effective end of its permitted travel without causing damage.	Position of the operating device at the moment when the snap-action mechanism trips on its return to its original position.

Travel

	PT Pre-travel	OT Operating travel	POT Positive opening travel	TT Total travel	DT Differential travel
	Distance between the rest position RP and the tripping point TP.	Distance between the rest position RP and the operating point OP.	Minimum movement of the operating device required to ensure that the opening contact is positively opened.	Distance between the rest position RP and the overtravel limit OL.	Distance between the tripping point TP and the release position RLP.

- Positive opening action : see IEC/EN 60947-5-1 chapter 3, § 2.2

N.B. : The max. and min. values quoted for each detector (min. operating force, max. total travel, etc.) are the maxima and minima users must allow for if they are to use our products under the proper conditions.

Universal limit switches

➜ Series 83 840 0 Standard

➜ Series 83 840 7 Positive break operation

General characteristics	
Conformity to standards	IEC 947-5-1, EN 60947-5-1, NFC 63140, NFC 63143, VDE 0660/200 for version with positive break operation
Version	Single-pole
Protection	IP66
Connections	
Saddle washer and screw	M3.5
Max. wire cross-section	2 mm^2
Electrical protection	Internal earth terminal
Connection	for No. 13 sealing gland, 20.4 Ø, 1.411 pitch (supplied with 2 screw plugs, not mounted)

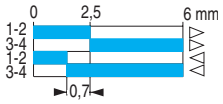
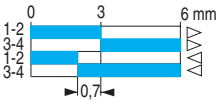
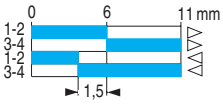
Universal limit switches

➜ Series 83 840 0 Standard

- **Adjustable metal head**
- **4 positions 90°**
- **Metal case**



Main specifications

		Steel plunger	Reinforced lever with plastic roller	Stepped adjustment roller lever
Housing	**Action**			
Metal	Snap action	**83 840 0**	**83 841 0**	**83 842 0**
General characteristics				
Function		NO+NC	NO+NC	NO+NC
Sequence Snap action				
Mechanical characteristics				
Minimum operating force (N)		10	15	8
Minimum operating force (cmN)		-	-	-
Minimum total travel force (N)		22	25	15
Minimum total travel force (cmN)		-	-	-
Mechanical life (operations)		10^7	10^7	10^7
Temperature limits use (°C)		-10 → +70	-10 → +70	-10 → +70
Weight (g)		310	310	310
Comments				
Accessories for 83 843 0 (see Dimensions - Mounting accessories) Galvanized, passivated steel lever Thermoplastic roller Supplied with nut, washer and locating block loose				

General characteristics

Assigned insulation voltage (Ui) V	600
Thermal current (Ith) A	10
Use category	AC 15 : A600 DC 13 : P300

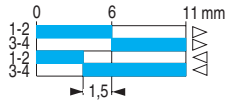
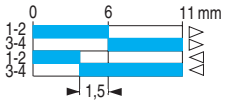
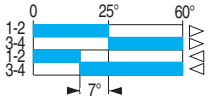
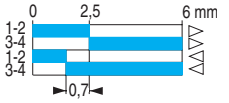
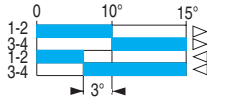
Product adaptations

- **Approvals : UL/CSA**

To order, see page 12





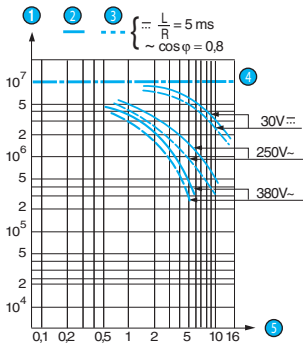
Adjustable roller lever	Adjustable lever with idle-return lever	Rotary head with momentary action Action to right and left	Top-mounted plunger with metal roller	Flexible metal lever
83 842 1	**83 842 2**	**83 843 0**	**83 845 0**	**83 846 0**
NO+NC	NO+NC	NO+NC	NO+NC	NO+NC
				
8	8	-	10	1.5
-	-	20	-	-
15	15	-	22	2.5
-	-	33	-	-
10^7	10^7	10^7	10^7	10^7
-10 → +70	-10 → +70	-20 → +70	-10 → +70	-10 → +70
310	310	310	300	310

Principles

Function
Four-terminal double break two-way contact element (form Za). The contacts must be of the same polarity.

Curves

Operating curve for standard version

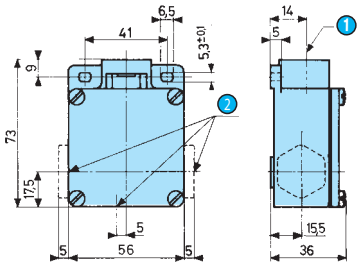


1. Number of operations
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

➜ Product

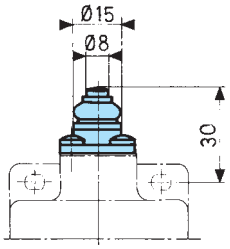
Body



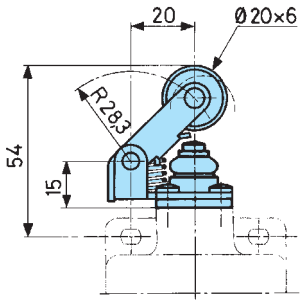
1 Axis of head rotation
2 No. 13 sealing gland

➜ Actuators

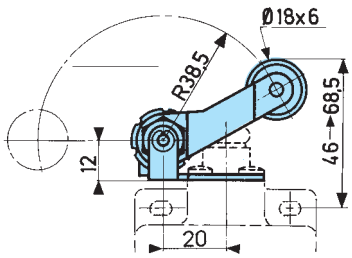
83 840 0



83 841 0

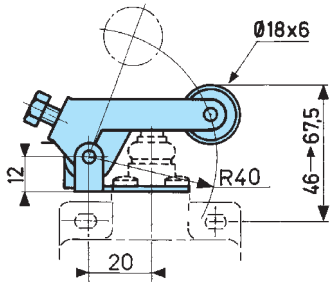


83 842 0

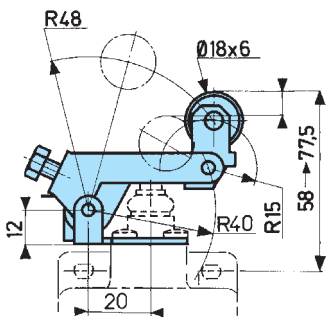


Min. angle between 2 successive adjustments 0°10

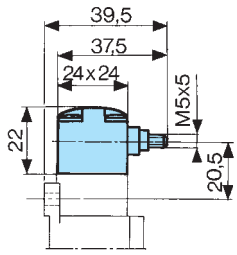
83 842 1



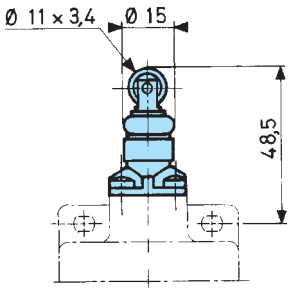
83 842 2



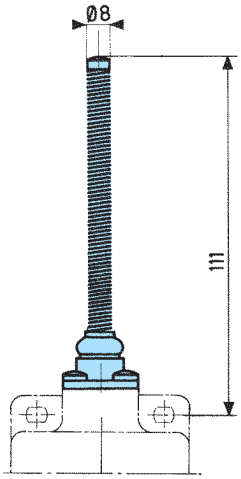
83 843 0



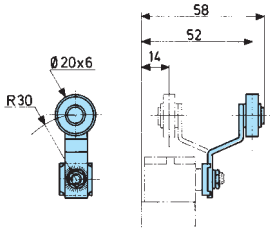
83 845 0



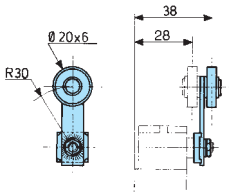
83 846 0



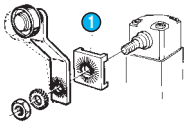
79 210 997 (for 83 843 0)



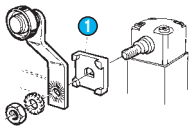
79 210 998 (for 83 843 0)



Lever settings or positions dictated by direction in which block 1 is fitted



1 Block 1
Adjustable in 6° steps



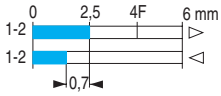
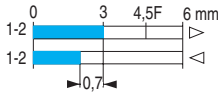
1 Block 1
Adjustable in 90° steps

Universal limit switches

➜ Series 83 840 7 Positive break operation

- **Adjustable metal head**
- **4 positions 90°**
- **Plastic or metal cases**

Main specifications

		Steel plunger	Reinforced lever with plastic roller
Housing	**Action**		
Metal	Snap action	**83 840 7**	**83 841 7**
General characteristics			
Function		NC	NC
Sequence Snap action			
Positive break operation			
Mechanical characteristics			
Minimum operating force (N)		10	15
Minimum operating force (cmN)		-	-
Minimum positive opening force (N)		10	15
Min. positive opening travel (cmN)		-	-
Minimum total travel force (N)		22	25
Minimum total travel force (cmN)		-	-
Mechanical life (operations)		10^7	10^7
Temperature limits use (°C)		-10 → +70	-10 → +70
Weight (g)		310	310

General characteristics

Assigned insulation voltage (Ui) V	600
Thermal current (Ith) A	2.5
Use category	AC 15 : C600 DC 13 : R 300
Short circuit test	Conforms to IEC 947.5.1 paragraph 8.34
Current peak	1000 A at 250 VAC 0.5 < cos φ < 0.7
Short circuit protection (SCPD)	Fuse 10 AgF

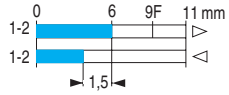
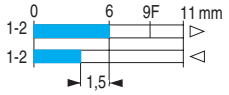
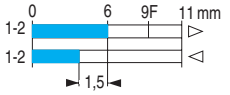
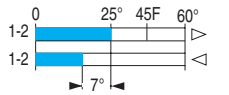
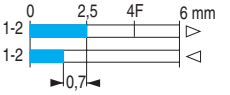
Product adaptations

- **Approvals : UL/CSA**

To order, see page 12

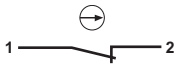




Stepped adjustment roller lever	Adjustable roller lever	Adjustable lever with idle-return lever	Rotary head with momentary action Action to right and left	Top-mounted plunger with metal roller
83 842 7	**83 842 8**	**83 842 9**	**83 843 7**	**83 845 7**
NC	NC	NC	NC	NC
				
8	8	8	-	10
-	-	-	20	-
10	10	10	-	10
-	-	-	20	-
15	15	15	-	22
-	-	-	33	-
10^7	10^7	10^7	10^7	10^7
-10 → +70	-10 → +70	-10 → +70	-20 → +70	-10 → +70
310	310	310	310	300

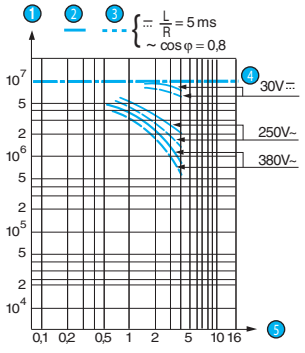
Principles

Function
Two-terminal double break contact element (form Y : normally closed contact) with positive break operation.



Curves

Operating curve for positive break version

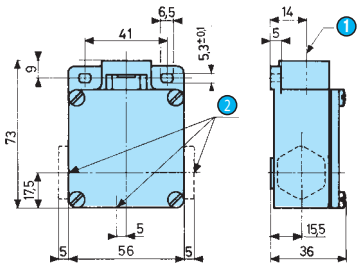


1. Number of operations
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

➜ Product

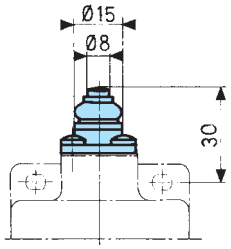
Body



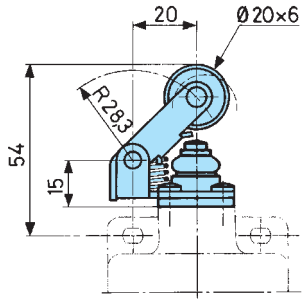
1 Axis of head rotation
2 No. 13 sealing gland

➜ Actuators

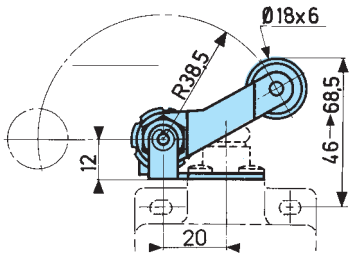
83 840 7



83 841 7

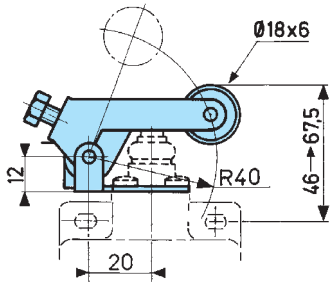


83 842 7

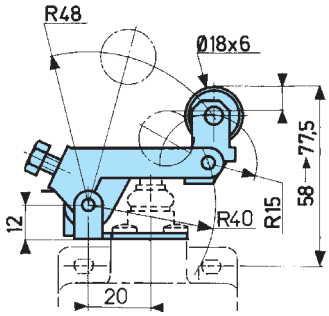


1 Min. angle between 2 successive adjustments 0°10

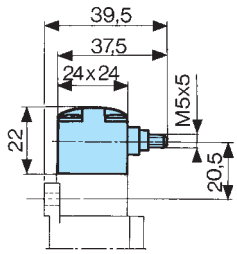
83 842 8



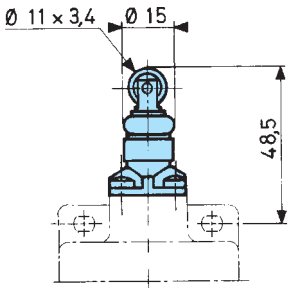
83 842 9



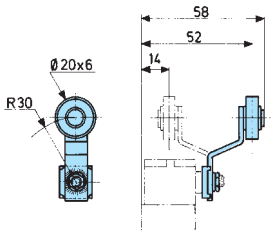
83 843 7



83 845 7



79 210 997 (for 83 843 7)



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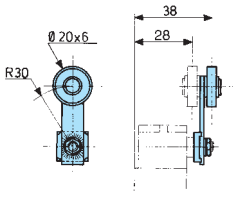
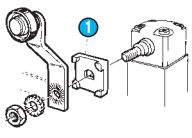




1 Block 1
Block 1 must not be mounted the other way round
Adjustable in 90° steps

Limit switch to standard EN 50047

- Series 83 850 with plunger/roller plunger
- Series 83 850 with roller lever
- Series 83 850 with adjustable roller lever
- Series 83 850 with special levers
- Series 83 854 with plunger/roller plunger with manual reset
- Series 83 854 with roller lever with manual reset
- Series 83 854 with adjustable roller lever with manual reset

Conformity to standards	
Conformity to standards	IEC 536-1, IEC 947-5-1, CSA C22.2 No. 14, EN 50047, EN 60947-5-1, EN 60204-1, NFC 20030 (class II for 83 850/class I for 83 851) , UL 508, VDE 0660/200
Protection	IP66
Version	Single-pole
Electrical characteristics	
Assigned insulation voltage (Ui) V	500
Thermal current (Ith) A	10
Use category	A300 - Q300 AC15=6 A/250 V - 1.9 A/380 V DC13=3 A/24 V
Short circuit test IEC 947.5.1	
Current peak	1000 A at 250 VAC 0.5 < cos φ < 0.7
Short circuit protection (SCPD)	fuse 10 A gF
Electrical protection by internal earth terminal (83 851 / 83 855)	•
Connections	
Saddle washer and screw	M 3.5
Max. wire cross-section	2 x 1.5 mm^2 / 1 x 2.5 mm^2
Connection	with sealing gland PG13
Approvals	83 850, 83 851 : UL listed A300 - Q300 CSA A300 - Q300 83 854, 83 855 : Slow break version NC + NO, UL/CSA please consult us

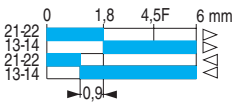
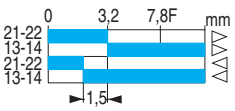
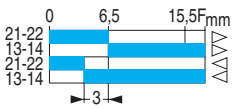
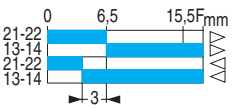
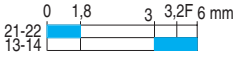
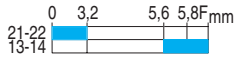
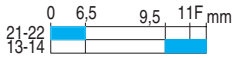
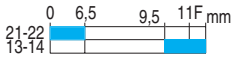
Limit switch to standard EN 50047

➜ Series 83 850 with plunger/roller plunger

- Adjustable metal head
- 4 positions 90°




Main specifications

Housing	Action	Steel plunger	Plunger with steel roller	Plunger + lever with vertical plastic roller	Plunger + lever with lateral plastic roller
Thermoplastic with double insulation	Snap action	**83 850 001**	**83 850 501**	**83 850 101**	**83 850 201**
Thermoplastic with double insulation	Dependent	**83 850 011**	**83 850 511**	**83 850 111**	**83 850 211**
Metal	Snap action	**83 851 001**	**83 851 501**	**83 851 101**	**83 851 201**
Metal	Dependent	**83 851 011**	**83 851 511**	**83 851 111**	**83 851 211**
General characteristics					
Special option - configuration EN 50047		B	C	E	-
Function		NC+NO	NC+NO	NC+NO	NC+NO
Sequence Snap action					
Sequence Dependent action					
Positive break operation					
Minimum operating force (N)		10	10	9	9
Minimum total travel force (N)		12	12	10	10
Min. positive opening travel (N)		25	25	20	20
Mechanical life (millions of operations) mini.		15	15	15	15
Temperature limits use (°C)		-25 → +80	-25 → +80	-25 → +80	-25 → +80
Temperature limits stored (°C)		-40 → +80	-40 → +80	-40 → +80	-40 → +80
Protection rating		IP 66	IP 66	IP 66	IP 66
Weight (plastic/metal) (g)		90/185	100/185	100/185	100/185

Product adaptations

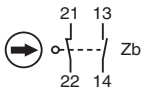
- Operating sequence
- Number of circuits
- Type of function
- Direction of head
- Connection via ISO sealing gland
- Special marking
- Pre-wiring option

To order, see page 12

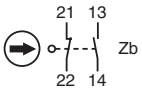
Principles

Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

Independent snap action contact 1 NO + 1 NC



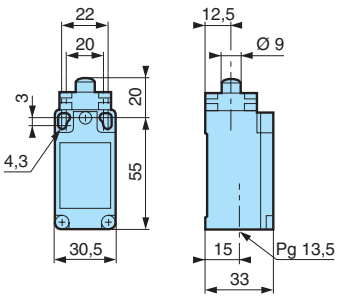
Dependent action contact 1 NO + 1 NC



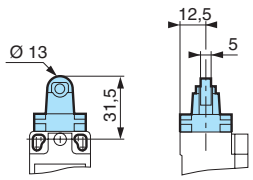
Dimensions

➜ Product

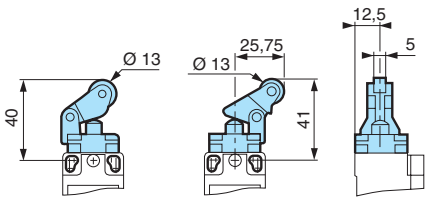
83 850 001/011
83 851 001/011



83 850 501/511
83 851 501/511



83 850 101/111 - 201/211
83 851 101/111 - 201/211



2

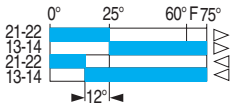
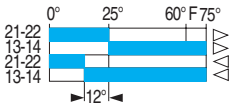
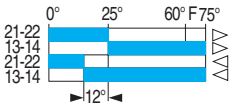
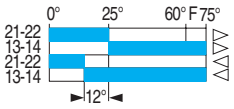
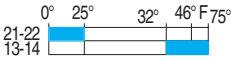
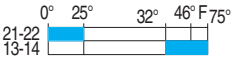
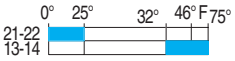
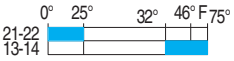
Limit switch to standard EN 50047

➜ Series 83 850 with roller lever

- Adjustable metal rotary head
- 4 positions 90°
- Momentary action
- Action to right and left
- Plastic or rubber roller




Main specifications

Housing	Action	With lever and plastic roller Ø22 offset 40	With lever and plastic roller Ø19 offset 53	With lever and rubber roller Ø50 offset 47	With lever and rubber roller Ø50 offset 53.5
Thermoplastic with double insulation	Snap action	**83 850 301**	**83 850 302**	**83 850 305**	**83 850 306**
Thermoplastic with double insulation	Dependent	**83 850 311**	**83 850 312**	**83 850 315**	**83 850 316**
Metal	Snap action	**83 851 301**	**83 851 302**	**83 851 305**	**83 851 306**
Metal	Dependent	**83 851 311**	**83 851 312**	**83 851 315**	**83 851 316**
General characteristics					
Special option - configuration EN 50047		-	A	-	-
Function		NC+NO	NC+NO	NC+NO	NC+NO
Sequence Snap action					
Sequence Dependent action					
Positive break operation					
Minimum operating force (cmN)		28	28	28	28
Minimum total travel force (cmN)		37	37	37	37
Min. positive opening travel (cmN)		75	75	75	75
Mechanical life (millions of operations) mini.		15	15	15	15
Temperature limits use (°C)		-25 → +80	-25 → +80	-25 → +80	-25 → +80
Temperature limits stored (°C)		-40 → +80	-40 → +80	-40 → +80	-40 → +80
Protection rating		IP 66	IP 66	IP 66	IP 66
Weight (plastic/metal) (g)		130/220	130/220	145/235	145/235

Product adaptations

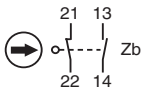
- Operating sequence
- Number of circuits
- Type of function
- Direction of head and lever
- Connection via ISO sealing gland
- Special marking
- Pre-wiring option
- Special levers

To order, see page 12

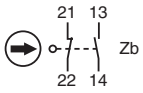
Principles

Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

Snap action contact 1 NO + 1 NC



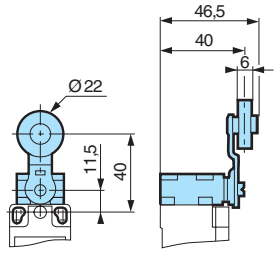
Dependent action contact 1 NO + 1 NC



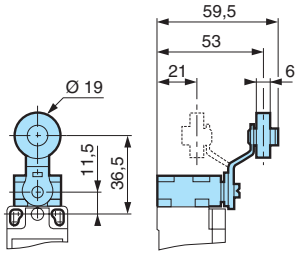
Dimensions

➜ Product

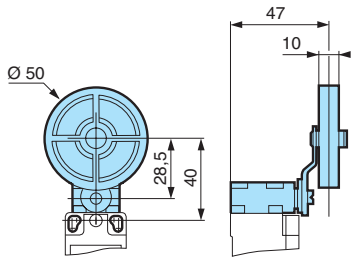
83 850 301/311
83 851 301/311



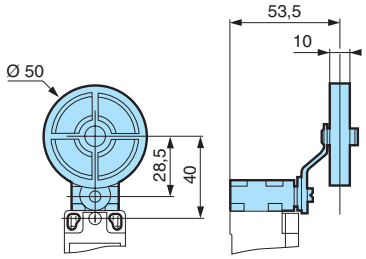
83 850 302/312
83 851 302/312



83 850 305/315
83 851 305/315



83 850 306/316
83 851 306/316



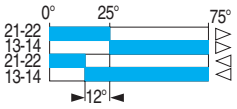
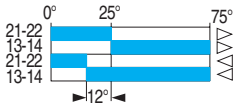
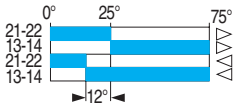
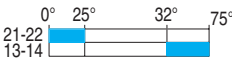
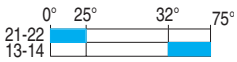
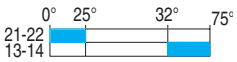
Limit switch to standard EN 50047

➜ Series 83 850 with adjustable roller lever

- Adjustable metal rotary head
- 4 positions 90°
- Momentary action
- Action to right and left
- Plastic or rubber roller



Main specifications

		With adjustable lever and plastic roller Ø22 offset 32.5 or 45	With adjustable lever and rubber roller Ø50 offset 46	With adjustable lever and rubber roller Ø50 adjustable offset 53.5 to 69.5
Housing	**Action**			
Thermoplastic with double insulation	Snap action	**83 850 303**	**83 850 307**	**83 850 308**
Thermoplastic with double insulation	Dependent	**83 850 313**	**83 850 317**	**83 850 318**
Metal	Snap action	**83 851 303**	**83 851 307**	**83 851 308**
Metal	Dependent	**83 851 313**	**83 851 317**	**83 851 318**
General characteristics				
Function		NC+NO	NC+NO	NC+NO
Sequence Snap action				
Sequence Dependent action				
Minimum operating force (cmN)		28	28	28
Minimum total travel force (cmN)		37	37	37
Min. positive opening travel (cmN)		75	75	75
Mechanical life (millions of operations) mini.		15	15	15
Temperature limits use (°C)		-25 → +80	-25 → +80	-25 → +80
Temperature limits stored (°C)		-40 → +80	-40 → +80	-40 → +80
Protection rating		IP 66	IP 66	IP 66
Weight (plastic/metal) (g)		150/240	165/255	165/255

Product adaptations

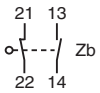
- Operating sequence
- Number of circuits
- Type of function
- Direction of head and lever
- Connection via ISO sealing gland
- Special marking
- Pre-wiring option

To order, see page 12

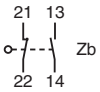
Principles

Function
Four-terminal double break two-way contact element (form Zb). The 2 moving contacts are electrically isolated from one another.
Units with adjustable levers do not conform to standard IEC/EN 60947-5-1

Snap action contact 1 NO + 1 NC



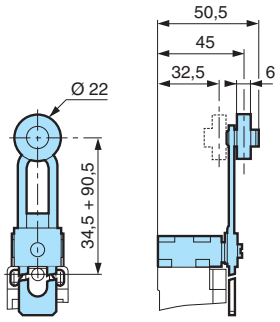
Dependent action contact 1 NO + 1 NC



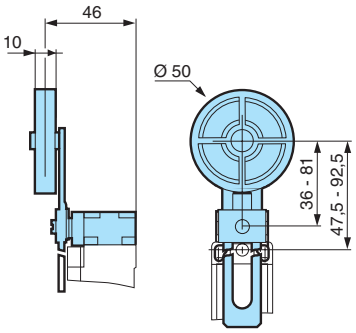
Dimensions

➜ Product

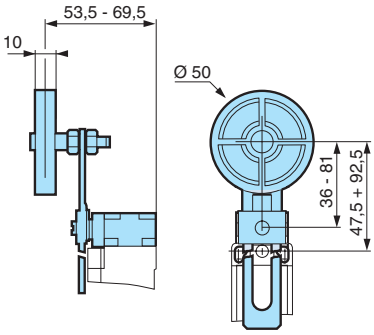
83 850 303/313
83 851 303/313



83 850 307/317
83 851 307/317



83 850 308/318
83 851 308/318

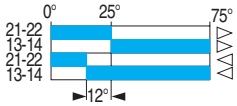
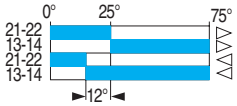
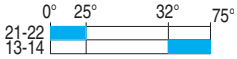
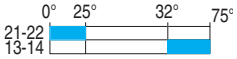


Limit switch to standard EN 50047

➜ Series 83 850 with special levers

- Adjustable metal rotary head
- 4 positions 90°
- Momentary action
- Action to right and left

Main specifications

		With adjustable polyamide rod actuator	Flexible metal lever
Housing	**Action**		
Thermoplastic with double insulation	Snap action	**83 850 304**	**83 850 601**
Thermoplastic with double insulation	Dependent	**83 850 314**	**83 850 611**
Metal	Snap action	**83 851 304**	**83 851 601**
Metal	Dependent	**83 851 314**	**83 851 611**
General characteristics			
Function		NC+NO	NC+NO
Sequence Snap action			
Sequence Dependent action			
Minimum operating force (cmN)		28	-
Minimum operating force (N)		-	3
Minimum total travel force (cmN)		37	-
Minimum total travel force (N)		-	4.5
Min. positive opening travel (cmN)		75	-
Mechanical life (millions of operations) mini.		15	15
Temperature limits use (°C)		-25 → +80	-25 → +80
Temperature limits stored (°C)		-40 → +80	-40 → +80
Protection rating		IP 66	IP 66
Weight (plastic/metal) (g)		150/240	150/240

Product adaptations

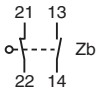
- Operating sequence
- Number of circuits
- Type of function
- Direction of head and lever
- Connection via ISO sealing gland
- Length of polyamide rod actuator
- Length of flexible lever
- Special marking
- Pre-wiring option

To order, see page 12

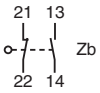
Principles

Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

Snap action contact 1 NO + 1 NC



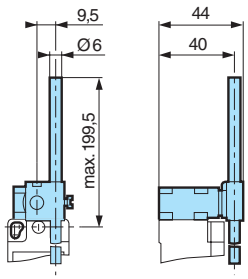
Dependent action contact 1 NO + 1 NC



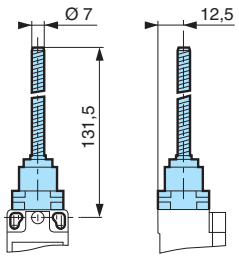
Dimensions

➜ Product

83 850 304/314
83 851 304/314



83 850 601/611
83 851 601/611



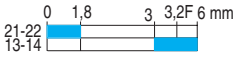
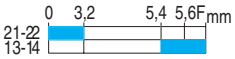
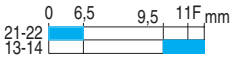
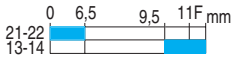
Limit switch to standard EN 50047

➜ Series 83 854 with plunger/roller plunger with manual reset

- Adjustable metal head
- 4 positions 90°
- Maintained action
- Manual reset




Main specifications

Housing	Action	Steel plunger	Plunger with steel roller	Plunger + lever with vertical plastic roller	Plunger + lever with lateral plastic roller
Thermoplastic	Dependent	83 854 011	83 854 511	83 854 111	83 854 211
Metal	Dependent	83 855 011	83 855 511	83 855 111	83 855 211
General characteristics					
Sequence Dependent action					
Positive break operation					
Minimum operating force (N)		10	9	9	9
Minimum total travel force (N)		12	10	10	10
Minimum positive operating force (N)		2.5	2.5	20	20
Mechanical life 10^6 operations mini.		1	1	1	1
Temperature limits use (°C)		-20 → +80	-20 → +80	-20 → +80	-20 → +80
Temperature limits stored (°C)		-40 → +80	-40 → +80	-40 → +80	-40 → +80
Protection rating		IP 66	IP 66	IP 66	IP 66
Weight (plastic/metal) (g)		145/230	155/240	150/240	150/240

Product adaptations

- Number of circuits
- Type of function
- Direction of head
- Connection via ISO sealing gland
- Special marking
- Pre-wiring option

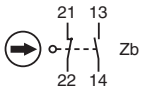
To order, see page 12

Principles

Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

- After actuation, the safety contact remains locked open in position "NC". It is unlocked by pressing the reset button.

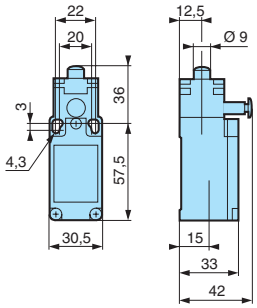
Dependent action contact 1 NO + 1 NC



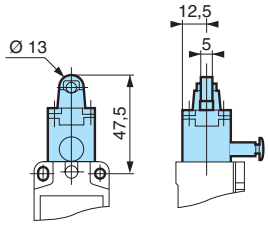
Dimensions

➜ Product

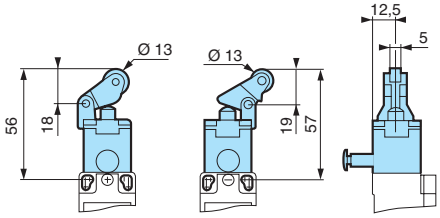
83 854 011
83 855 011



83 854 511
83 855 511



83 854 111/211
83 855 111/211



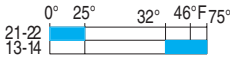
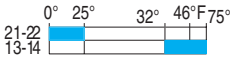
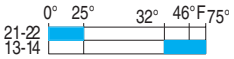
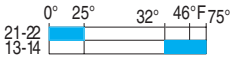
Limit switch to standard EN 50047

➜ Series 83 854 with roller lever with manual reset

- Adjustable metal head
- 4 positions 90°
- Momentary action
- Action to right and left
- Manual reset
- Plastic or rubber roller




Main specifications

Housing	Action	With lever and plastic roller Ø19 offset 21 or 53	With lever and plastic roller Ø22 offset 33.5 or 40	With lever and rubber roller Ø50 offset 47	With lever and rubber roller Ø50 offset 53.5
Thermoplastic	Dependent	**83 854 312**	**83 854 311**	**83 854 315**	**83 854 316**
Metal	Dependent	**83 855 312**	**83 855 311**	**83 855 315**	**83 855 316**
General characteristics					
Sequence Dependent action					
Positive break operation					
Minimum operating force (cmN)		28	28	28	28
Minimum total travel force (cmN)		37	37	37	37
Minimum positive operating force (cmN)		75	75	75	75
Mechanical life 10^6 operations mini.		1	1	1	1
Temperature limits use (°C)		-20 → +80	-20 → +80	-20 → +80	-20 → +80
Temperature limits stored (°C)		-40 → +80	-40 → +80	-40 → +80	-40 → +80
Protection rating		IP 66	IP 66	IP 66	IP 66
Weight (plastic/metal) (g)		190/270	190/270	190/270	190/270

Product adaptations

- Number of circuits
- Type of function
- Direction of head and lever
- Connection via ISO sealing gland
- Special marking
- Pre-wiring option
- Special levers

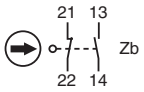
To order, see page 12

Principles

Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

- After actuation, the safety contact remains locked open in position "NC". It is unlocked by pressing the reset button.

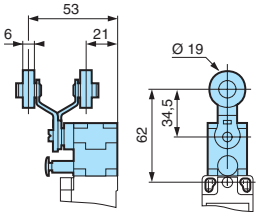
Dependent action contact 1 NO + 1 NC



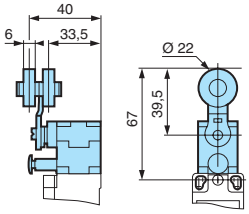
Dimensions

➜ Product

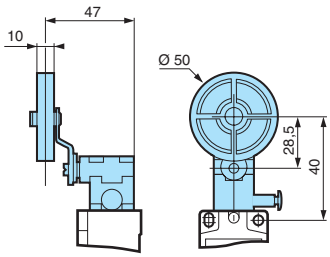
83 854 312
83 855 312



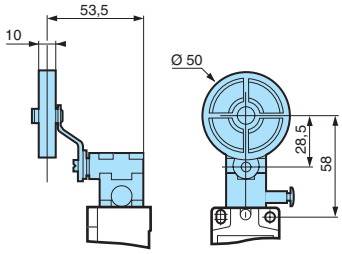
83 854 311
83 855 311



83 854 315
83 855 315



83 854 316
83 855 316

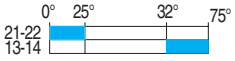
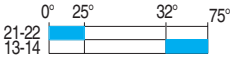
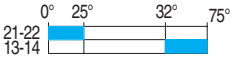


Limit switch to standard EN 50047

➜ Series 83 854 with adjustable roller lever with manual reset

- Adjustable metal head
- 4 positions 90°
- Maintained action
- Manual reset
- Plastic or rubber roller

Main specifications

Housing	Action	With adjustable lever and plastic roller Ø22 offset 32.5 or 45	With adjustable lever and plastic roller Ø50 offset 46	With adjustable lever and rubber roller Ø50 adjustable offset 53.5 to 69.5
Thermoplastic	Dependent	**83 854 313**	**83 854 317**	**83 854 318**
Metal	Dependent	**83 855 313**	**83 855 317**	**83 855 318**
General characteristics				
Sequence Dependent action				
Minimum operating force (cmN)		28	28	28
Minimum total travel force (cmN)		37	37	37
Mechanical life 10^6 operations mini.		1	1	1
Temperature limits use (°C)		-20 → +80	-20 → +80	-20 → +80
Temperature limits stored (°C)		-40 → +80	-40 → +80	-40 → +80
Protection rating		IP 66	IP 66	IP 66
Weight (plastic/metal) (g)		210/300	210/300	230/320

Product adaptations

- Number of circuits
- Type of function
- Direction of head and lever
- Connection via ISO sealing gland
- Special marking
- Pre-wiring option

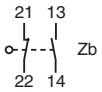
To order, see page 12

Principles

Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

- After actuation, the safety contact remains locked open in position "NC". It is unlocked by pressing the reset button.

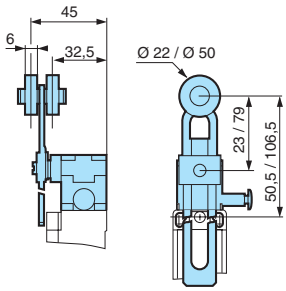
Dependent action contact 1 NO + 1 NC



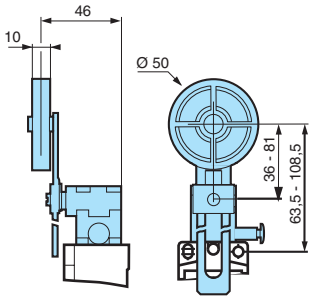
Dimensions

➜ Product

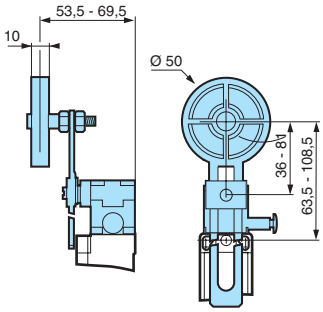
83 854 313
83 855 313



83 854 317
83 855 317



83 854 318
83 855 318



Limit switch to standard EN 50041

➜ Series 83 861 with plunger/roller plunger
➜ Series 83 861 with roller lever
➜ Series 83 861 with adjustable roller lever
➜ Series 83 861 with special levers
➜ Series 83 863 cable-operated with manual reset

Conformity to standards	
Conformity to standards	EN 5041, IEC 947-5-1, VDE 0660/200, UL 508, CSA C22.2 No. 14, IEC 536-1, EN 60204-1, NFC 20030 class I
Protection	IP66
Electrical characteristics	
Assigned insulation voltage (Ui) V	500
Thermal current (Ith) A	10
Use category	A300 - Q300 AC15=6 A/250 V - 1.9 A/380 V DC13=3 A/24 V
Short circuit test IEC 947.5.1	
Current peak	1000 A at 250 VAC 0.5 < cos φ < 0.7
Short circuit protection (SCPD)	fuse 10 A gF
Electrical protection by internal earth terminal	•
Connections	
Saddle washer and screw	M 3.5
Max. wire cross-section	2 x 1.5 mm^2 / 1 x 2.5 mm^2
Connection	with sealing gland PG13
Approvals	UL listed A300 - Q300 - CSA A300

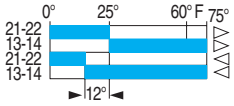
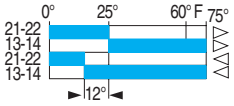
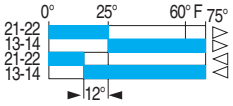
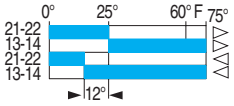
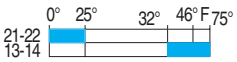
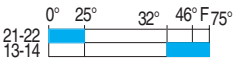
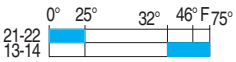
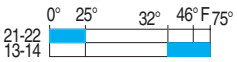
Limit switch to standard EN 50041

➜ Series 83 861 with roller lever

- Adjustable metal rotary head
- 4 positions 90°
- Momentary action
- Action to right and left
- Plastic or rubber roller




Main specifications

Housing	Action	With lever and plastic roller Ø22 offset 43.5	With lever and plastic roller Ø19 offset 56	With lever and rubber roller Ø50 offset 50.5	With lever and rubber roller Ø50 offset 57
Metal	Snap action	**83 861 301**	**83 861 302**	**83 861 305**	**83 861 306**
Metal	Dependent	**83 861 311**	**83 861 312**	**83 861 315**	**83 861 316**
General characteristics					
Special option - configuration EN 50041		-	A	-	-
Function		NC + NO	NC + NO	NC + NO	NC + NO
Sequence Snap action					
Sequence Dependent action					
Positive break operation					
Minimum operating force (cmN)		28	28	28	28
Minimum total travel force (cmN)		37	37	37	37
Min. positive opening travel (cmN)		75	75	75	75
Mechanical life (millions of operations) mini.		15	15	15	15
Temperature limits use (°C)		-25 → +80	-25 → +80	-25 → +80	-25 → +80
Temperature limits stored (°C)		-40 → +80	-40 → +80	-40 → +80	-40 → +80
Protection rating		IP 66	IP 66	IP 66	IP 66
Weight (plastic/metal) (g)		340/385	340/385	340/400	340/400

Product adaptations

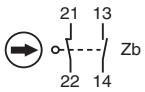
- Operating sequence
- Number of circuits
- Type of function
- Direction of head and lever
- Connection via ISO sealing gland
- Special marking
- Pre-wiring option

To order, see page 12

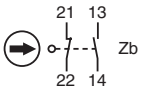
Principles

Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

Snap action contact 1 NO + 1 NC



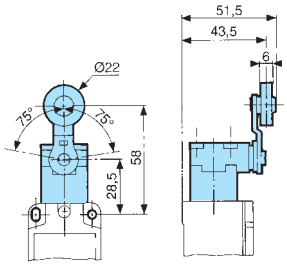
Dependent action contact 1 NO + 1 NC



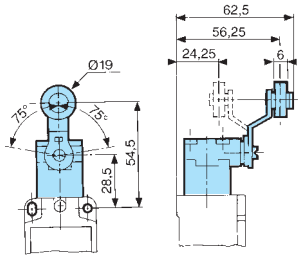
Dimensions

➜ Product

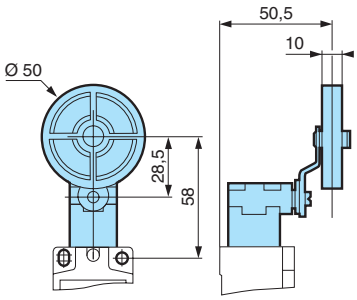
83 861 301 / 311



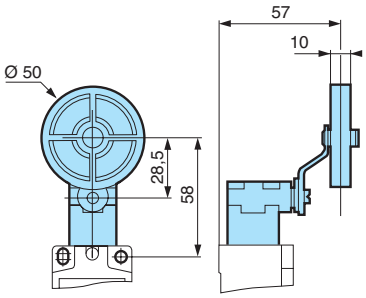
83 861 302 / 312



83 861 305 / 315



83 861 306 / 316



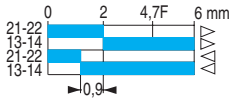
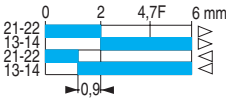
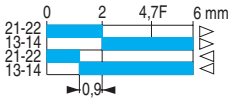
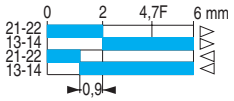
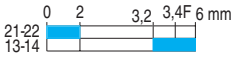
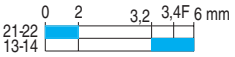
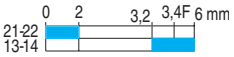
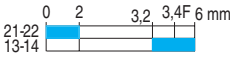
Limit switch to standard EN 50041

➜ Series 83 861 with plunger/roller plunger

- **Adjustable metal head**
- **4 positions 90°**
- **Metal case**




Main specifications

Housing	Action	Steel plunger	Plunger with steel roller	Plunger + lever with vertical plastic roller	Plunger + lever with lateral plastic roller
Metal	Snap action	**83 861 001**	**83 861 501**	**83 861 101**	**83 861 201**
Metal	Dependent	**83 861 011**	**83 861 511**	**83 861 111**	**83 861 211**
General characteristics					
Special option - configuration EN 50041		B	C	-	-
Function		NC + NO	NC + NO	NC + NO	NC + NO
Sequence Snap action					
Sequence Dependent action					
Positive break operation					
Minimum operating force (N)		10	10	9	9
Minimum total travel force (N)		12	12	10	10
Min. positive opening travel (N)		25	25	20	20
Temperature limits use (°C)		-25 → +80	-25 → +80	-25 → +80	-25 → +80
Temperature limits stored (°C)		-40 → +80	-40 → +80	-40 → +80	-40 → +80
Protection rating		IP 66	IP 66	IP 66	IP 66
Weight (plastic/metal) (g)		215/340	215/350	215/360	215/365

Product adaptations

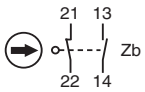
- **Operating sequence**
- **Number of circuits**
- **Type of function**
- **Direction of head**
- **Connection via ISO sealing gland**
- **Special marking**
- **Pre-wiring option**

To order, see page 12

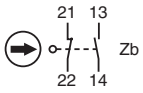
Principles

Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

Snap action contact 1 NO + 1 NC



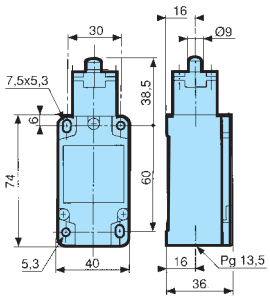
Dependent action contact 1 NO + 1 NC



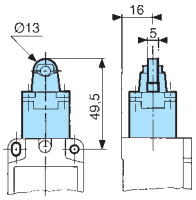
Dimensions

➜ Product

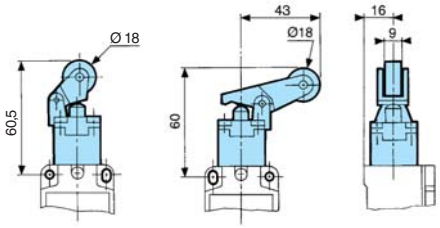
83 861 001 / 011



83 861 501 / 511



83 861 101 / 111 / 201 / 211

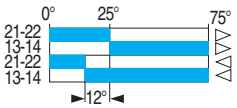
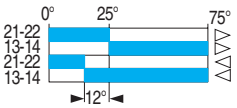
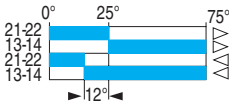
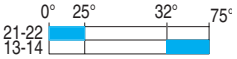
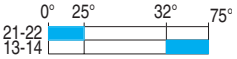
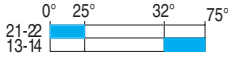


Limit switch to standard EN 50041

➜ Series 83 861 with adjustable roller lever

- Adjustable metal rotary head
- 4 positions 90°
- Momentary action
- Action to right and left
- Plastic or rubber roller

Main specifications

Housing	Action	With adjustable lever and plastic roller Ø22 offset 36 or 48	With adjustable lever and rubber roller Ø50 offset 49	With adjustable lever and rubber roller Ø50 adjustable offset 57 to 73
Metal	Snap action	**83 861 303**	**83 861 307**	**83 861 308**
Metal	Dependent	**83 861 313**	**83 861 317**	**83 861 318**
General characteristics				
Function		NC + NO	NC + NO	NC + NO
Sequence Snap action				
Sequence Dependent action				
Minimum operating force (cmN)		28	28	28
Minimum total travel force (cmN)		37	37	37
Min. positive opening travel (cmN)		75	75	75
Temperature limits use (°C)		-25 → +80	-25 → +80	-25 → +80
Temperature limits stored (°C)		-40 → +80	-40 → +80	-40 → +80
Protection rating		IP 66	IP 66	IP 66
Weight (plastic/metal) (g)		365/405	365/420	365/420

Product adaptations

- Operating sequence
- Number of circuits
- Type of function
- Direction of head and lever
- Connection via ISO sealing gland
- Special marking
- Pre-wiring option

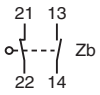
To order, see page 12

Principles

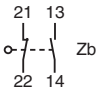
Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

- Units with adjustable levers do not conform to standard IEC/EN 60947-5-1.

Snap action contact 1 NO + 1 NC



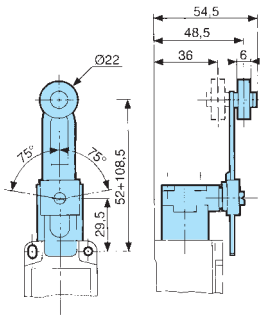
Dependent action contact 1 NO + 1 NC



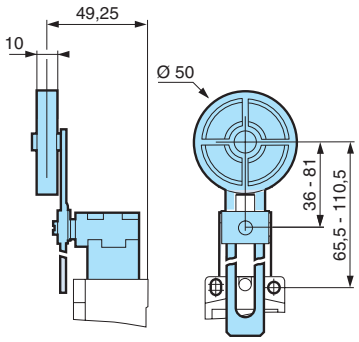
Dimensions

➜ Product

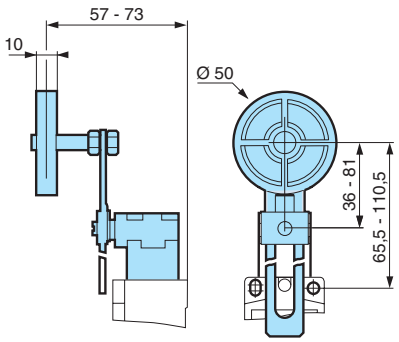
83 861 303 / 313



83 861 307 / 317



83 861 308 / 318

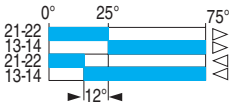
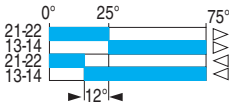
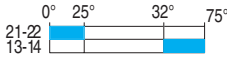
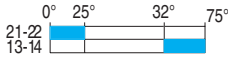


Limit switch to standard EN 50041

➜ Series 83 861 with special levers

- **Adjustable metal rotary head**
- **4 positions 90°**
- **Momentary action**
- **Action to right and left**

Main specifications

Housing	Action	With adjustable polyamide rod actuator	Flexible metal lever
Metal	Snap action	**83 861 304**	**83 861 601**
Metal	Dependent	**83 861 314**	**83 861 611**
General characteristics			
Special option - configuration EN 50041		D	D
Function		NC + NO	NC + NO
Sequence Snap action			
Sequence Dependent action			
Minimum operating force (cmN)		28	3
Minimum total travel force (cmN)		37	4.5
Min. positive opening travel (cmN)		75	-
Temperature limits use (°C)		-25 → +80	-25 → +80
Temperature limits stored (°C)		-40 → +80	-40 → +80
Protection rating		IP 66	IP 66
Weight (plastic/metal) (g)		360/405	335/375

Product adaptations

- **Operating sequence**
- **Number of circuits**
- **Type of function**
- **Direction of head and lever**
- **Connection via ISO sealing gland**
- **Length of polyamide rod actuator**
- **Length and Ø of flexible lever**
- **Special marking**
- **Pre-wiring option**

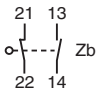
To order, see page 12

Principles

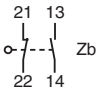
Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

- Units with adjustable levers or flexible levers do not conform to standard IEC/EN 60947-5-1.

Snap action contact 1 NO + 1 NC



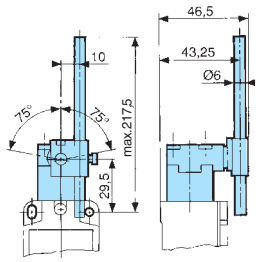
Dependent action contact 1 NO + 1 NC



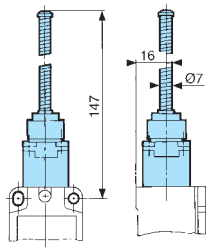
Dimensions

➜ Product

83 861 304 / 314



83 861 601 / 611

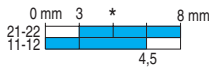


Limit switch to standard EN 50041

➜ Series 83 863 cable-operated with manual reset

- **Cable-operated limit switches are safety devices used to cut the electrical power circuit and ensure the safety of both personnel and machinery.**
- **Certain applications require safety checks over a long distance. For such applications the operator must be able to interrupt the system immediately by pulling on the cable, irrespective of his position in relation to the machine.**

Main specifications

		Dependent action
Housing	**Action**	
Metal	Dependent	**83 863 001**
General characteristics		
Function		NO + NC
Sequence Dependent action		
Positive break operation		
Initial force (N)		50
Minimum operating force (N)		60
Minimum operating travel (mm)		4
Differential travel (mm)		2
Maximum total travel (mm)		8
Mechanical life 10^6 operations		30
Temperature limits use (°C)		-20 → +80
Temperature limits stored (°C)		-40 → +80
Protection rating		IP 66
Cable length (m)		6
Weight (g)		430
Comments		
* Setting point		

Product adaptations

- **Type of function**
- **Accessories**
- **Special operation**
- **Special marking**
- **Pre-wiring option**

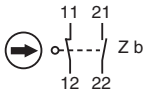
To order, see page 12

Principles

Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

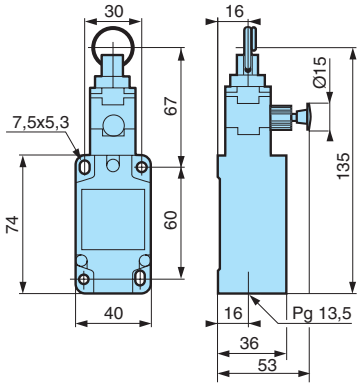
- After actuation, the safety contact remains locked open in position "NC". It is unlocked by pressing the reset button.

Dependent action contact with overlap 1 NO + 1 NC

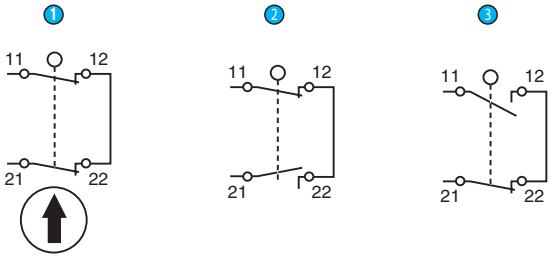


Dimensions

➜ Product



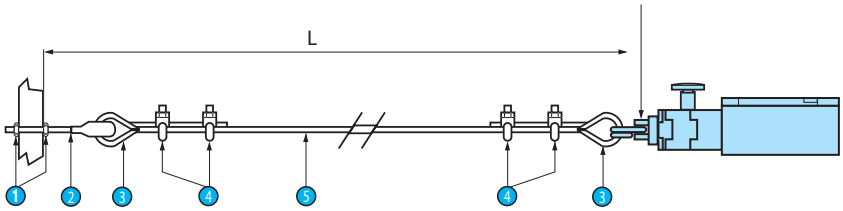
Connections



1. Cable taut in standby position
2. Cable broken
3. Cable pulled

Note : contacts 11-12 and 21-22 must be wired in series.

Applications



1. Hexagonal nut BM 10 DIN 439
2. Threaded ring BM 10 DIN 439
3. 5 mm B cable eyelet DIN 6899
4. 5 mm cable clamp DIN 1480
5. Steel cable, red PVC sheath Ø 5

In standby position, the wire must be sufficiently taut for the groove on the head to be showing, and contacts 11-12 and 21-22 to be closed.
L : Free length of cable (6 m max.)

Compact limit switch conforming to NFC 63 145

➜ Series 83 870 with cable output
➜ Series 83 870 with connector output
➜ Series 83 870 with low level cable or connector output
➜ Series 83 880 with cable output

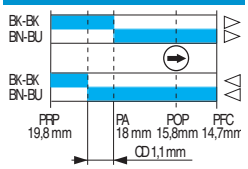
General characteristics	
Conformity to standards	IEC/EN 60947.5.1 Dimensional conformity : NFC 63145 Low voltage directive : 73/23/EEC and 93/68/EEC Declaration of incorporation in accordance with Machinery directive 89/392/EEC/IEC/EN : 60204.1
Protection against electric shocks	NFC 20030 or IEC 60536 class 1, degree of pollution 3
Degree of protection IEC 60529	IP 66/67
Degree of protection according to NEMA 250	Type 1, 3, 4, 6, 13
Electrical characteristics	
Connections	5-core cable (UL) , 0.75 mm² AWG19, ext. Ø 7.3 mm
Operating temperature (°C)	-25 → +70°C

Compact limit switch conforming to NFC 63 145

➜ Series 83 870 with cable output

- **IP 66/67**
- **Metal case**
- **cUL approval**

Main specifications

Characteristics	Type of output	Metal plunger
Standard	Cable length 1 m	**83 870 101**
Standard	Cable length 2 m	**83 870 102**
Standard	Cable length 3 m	**83 870 103**
Standard	Cable length 6 m	**83 870 106**
Plunger with 90° roller	Cable length 1 m	-
Plunger with 90° roller	Cable length 2 m	-
Plunger with 90° roller	Cable length 3 m	-
Plunger with 90° roller	Cable length 6 m	-
Mechanical characteristics		
Sequence Snap action		
Minimum operating force (N)		10
Minimum operating force (Nm)		-
Minimum total travel force (N)		30
Minimum total travel force (Nm)		-
Min. positive opening travel (N)		28
Min. positive opening travel (Nm)		-
Mechanical life millions of operations		10
Vertical approach speed		1 mm/min → 0.5 m/s
Horizontal approach speed (30° cam)		-
Weight (g)		170

General characteristics

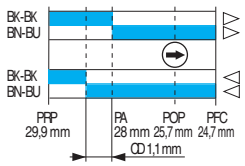
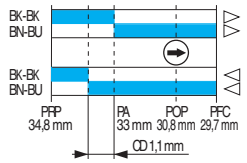
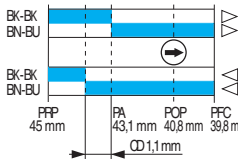
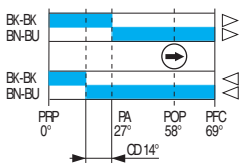
Assigned impulse voltage (Uimp) - V	2500
Assigned insulation voltage (Ui) V	500
Thermal current (Ith) A	10
Low-load switching - Minimum voltage (V)	10
Low-load switching - Minimum current (mA)	100
Assigned working characteristics (EN 60 947.5.1, UL 508)	A300 = AC15 240 V 3 A / 120 V 6 A Alternating current Q150 = DC13 125 V 0.55 A Direct current
Electrical life according to IEC 947-5-1 appendix C	250 V 3 A AC15 500.000 operations 24 V 8 W DC13 500.000 operations
Electrical protection	Integral protective earth conductor Short-circuit protection device : IEC/EN 60947-5-1 Fuse 6 AgG
Approvals	UL 508, UL 50

Product adaptations

- **Contact type**
- **Rear output**
- **Protective scraper seal**
- **Length of cable/connector/stripping**
- **Special marking**

To order, see page 12



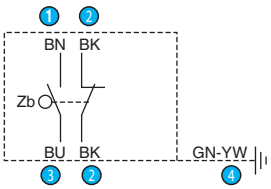

Metal roller plunger	Metal plunger with threaded barrel	Roller plunger - metal with threaded barrel	Metal roller lever (2 directions of attack)
83 871 101	**83 874 101**	**83 872 101**	**83 873 101**
83 871 102	**83 874 102**	**83 872 102**	**83 873 102**
83 871 103	**83 874 103**	**83 872 103**	**83 873 103**
83 871 106	**83 874 106**	**83 872 106**	**83 873 106**
83 875 101	-	**83 876 101**	-
83 875 102	-	**83 876 102**	-
83 875 103	-	**83 876 103**	-
83 875 106	-	**83 876 106**	-
			
10	10	10	-
-	-	-	0.15
30	30	30	-
-	-	-	0.35
30	28	28	-
-	-	-	0.15
10	10	28	10
1 mm/min → 0.5 m/s	1 mm/min → 0.5 m/s	1 mm/min → 0.5 m/s	-
1 mm/min → 0.3 m/s	-	1 mm/min → 0.3 m/s	1 mm/min → 1.5 m/s
180	200	200	210

Principles

Function

Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

Snap-action contact

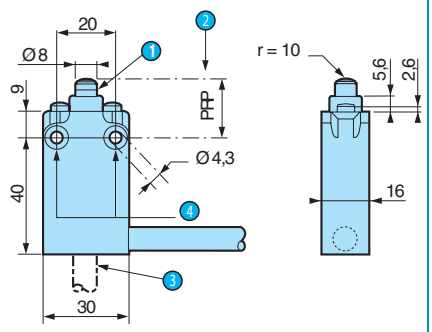


1 Brown
2 Black
3 Blue
4 Green-yellow

Dimensions

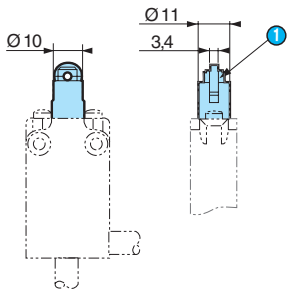
➜ Product

83 870 1



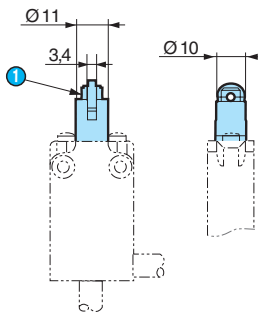
1. POP marking
2. See sequence diagram
3. Rear output on request
4. Ø 8 x 4.3 - 4 counterbores

83 871 1



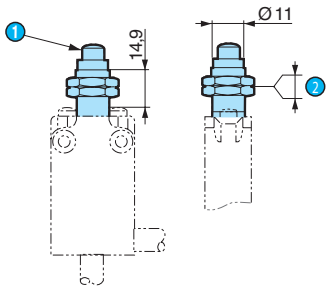
1. POP marking

83 875 1



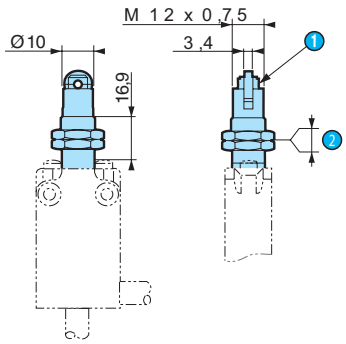
1. POP marking

83 874 1



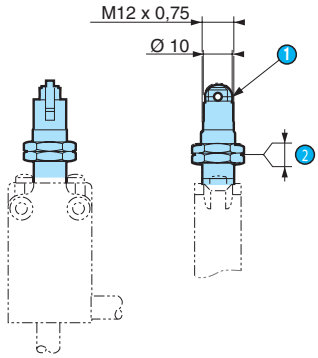
1. POP marking
2. Max. thickness 8.5 mm

83 872 1



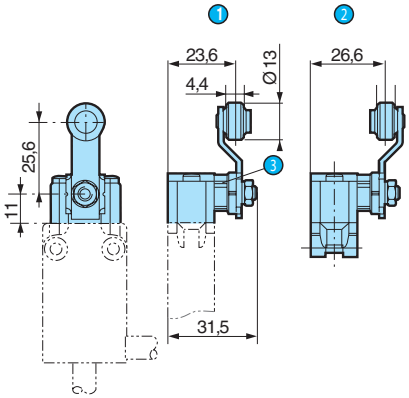
1. POP marking
2. Max.tightening thickness 10.5

83 876 1



1. POP marking
2. Max.tightening thickness 10.5

83 873 1



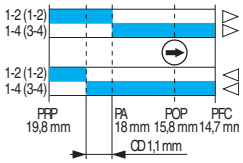
1. Offset A
2. Offset B (on request)
3. POP marking

Compact limit switch conforming to NFC 63 145

➜ Series 83 870 with connector output

- **IP 66/67**
- **Metal case**
- **cUL approval**

Main specifications

Characteristics	Type of output	Metal plunger
4-pin	Connector	**83 870 140**
4-pin 90°	Connector	-
5-pin	Connector	●
Mechanical characteristics		
Sequence Snap action		
Minimum operating force (N)		10
Minimum total travel force (N)		30
Min. positive opening travel (N)		28
Mechanical life millions of operations		10
Vertical approach speed		1 mm/min → 0.5 m/s
Horizontal approach speed (30° cam)		-
Weight (g)		90
Comments		
4-pin : 1-2 / 1-4 5-pin : (1-2) / (3-4)		

General characteristics

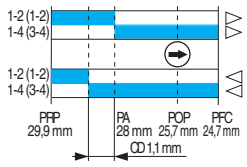
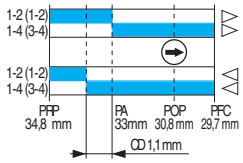
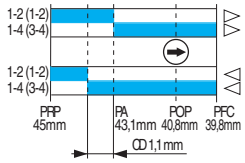
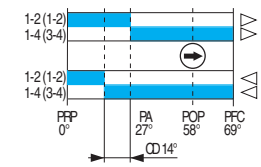
Assigned impulse voltage (Uimp) - V	2500 (5-pin : 1500)
Assigned insulation voltage (Ui) V	250 (5-pin : 60)
Thermal current (Ith) A	4
Low-load switching - Minimum voltage (V)	10
Low-load switching - Minimum current (mA)	100
Assigned working characteristics (EN 60 947.5.1, UL 508)	C 300/Ie = 4 A max/Ue = 250 V max (5-pin : Ie = 4 A max - Ue = 48 V max) Q 150
Electrical life according to IEC 947-5-1 appendix C	250 V 2.5 A AC15 500.000 operations 24 V 8 W DC13 500.000 operations
Electrical protection	Integral protective earth conductor Short-circuit protection device : IEC/EN 60947.5.1 Fuse 2 A gC
Approvals	UL 508 (4 pins C300 - Q 150) , (5 pins 48 V AC/DC 4 A)

Product adaptations

- **Contact type**
- **Rear output**
- **Protective scraper seal**
- **Cable length**

To order, see page 12

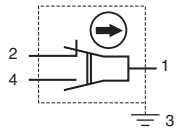



Metal roller plunger	Metal plunger with threaded barrel	Roller plunger - metal with threaded barrel	Steel metal roller lever (2 directions of attack)
83 871 140	**83 874 140**	**83 872 140**	**83 873 140**
83 875 140	-	**83 876 140**	-
●	●	●	●
			
10	10	10	15
30	30	30	35
28	28	28	15
10	10	10	10
1 mm/min → 0.5 m/s	1 mm/min → 0.5 m/s	1 mm/min → 0.5 m/s	-
1 mm/min → 0.3 m/s	-	1 mm/min → 0.3 m/s	1 mm/min → 1.5 m/s
100	120	120	130

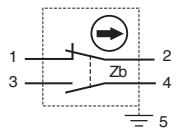
Principles

Function
Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another (5-pin version).

Snap-action contact
4-pin



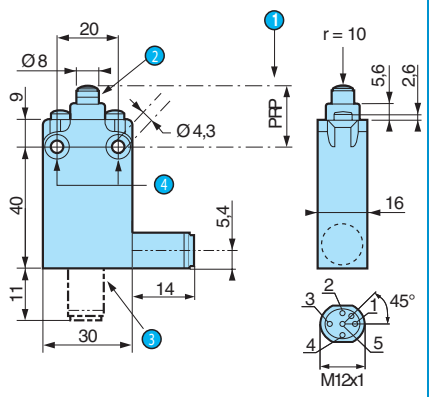
5-pin



Dimensions

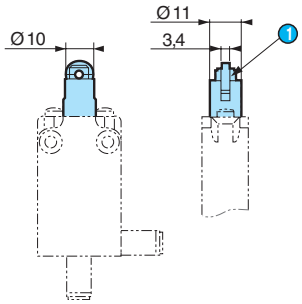
➜ Product

83 870 1



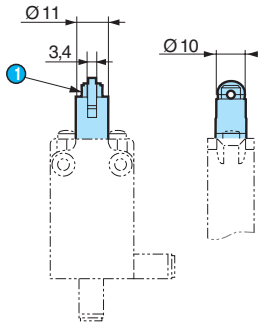
1. See sequence diagram
2. POP marking
3. Rear output on request
4. Ø 8 x 4.3 - 4 counterbores

83 871 1



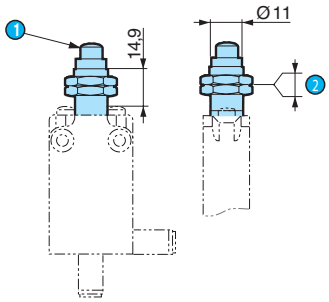
1. POP Marking

83 875 1



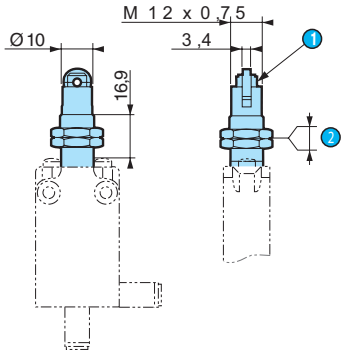
1. POP Marking

83 874 1



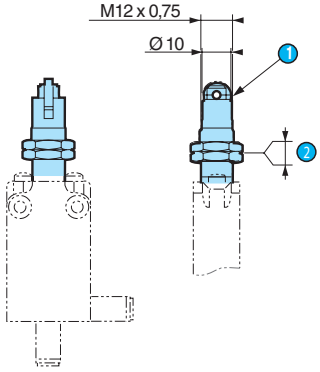
1. POP marking
2. Max.tightening thickness 8.5

83 872 1



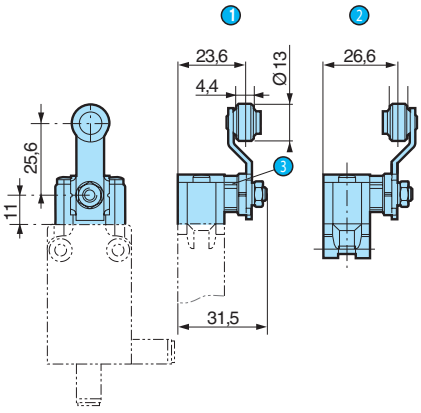
1. POP marking
2. Max.tightening thickness 10.5

83 876 1



1. POP marking
2. Max.tightening thickness 10.5

83 873 1



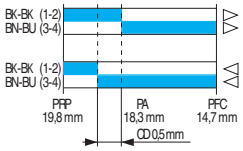
1. Offset A
2. Offset B (by request)
3. POP Marking

Compact limit switch conforming to NFC 63 145

➜ Series 83 870 with low level cable or connector output

- **IP 66/67**
- **Metal case**
- **UL approval**
- **Reduced differential travel**
- **Reduced pre-travel (83 873 only)**

Main specifications

Characteristics	Type of output	Metal plunger
Standard	Cable 1 m long	**83 870 301**
Standard	Connector	**83 870 320**
Plunger with 90° roller	Cable 1 m long	-
Plunger with 90° roller	Connector	-
Mechanical characteristics		
Sequence Snap action		
Minimum operating force (N)		10
Minimum total travel force (N)		30
Min. positive opening travel (N)		28
Mechanical life millions of operations		10
Vertical approach speed		1 mm/min → 0.5 m/s
Horizontal approach speed (30° cam)		-
Weight (g)		170
Comments		
Cable : BK-BK/BN-BU Connector : (1-2) / (3-4)		

General characteristics

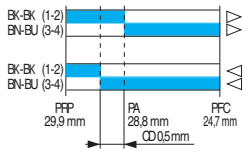
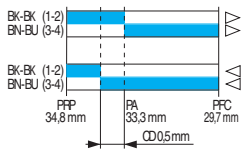
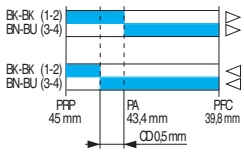
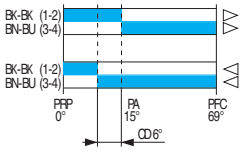
Assigned impulse voltage (Uimp) - V	2500
Assigned insulation voltage (Ui) V	250
Operating voltage	4 to 30 V
Operating current	1 to 100 mA
Resistance (Ω)	≤ 100 mΩ
Electrical protection	Integral earth wire Short-circuit protection device : IEC/EN 60947-5-1 Fuse 6 AgG
Approvals	UL 508, 30 V AC/DC : 0.14

Product adaptations

- **Contact type**
- **Rear output**
- **Protective scraper seal**
- **Length of cable/connector/stripping**

To order, see page 12

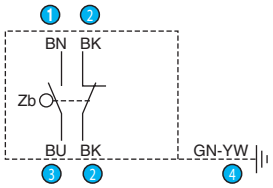



Metal roller plunger	Metal plunger with threaded barrel	Roller plunger - metal with threaded barrel	Steel metal roller lever (2 directions of attack)
83 871 301	**83 874 301**	**83 872 301**	**83 873 301**
83 871 320	**83 874 320**	**83 872 320**	**83 873 320**
83 875 301	-	**83 876 301**	-
83 875 320	-	**83 876 320**	-
			
10	10	10	15
30	30	30	35
28	28	28	15
10	10	10	10
1 mm/min → 0.5 m/s	1 mm/min → 0.5 m/s	1 mm/min → 0.5 m/s	-
1 mm/min → 0.3 m/s	-	1 mm/min → 0.3 m/s	1 mm/min → 1.5 m/s
180	200	200	210

Principles

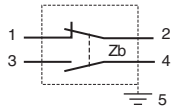
Function
Four-terminal double break two-way contact element (form Zb). The 2 moving contacts are electrically isolated from one another.

Snap-action contact
Cable



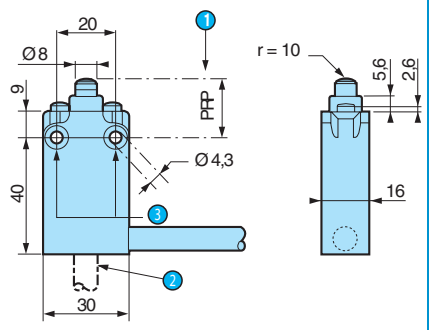
1 Brown
2 Black
3 Blue
4 Green-yellow

Connector



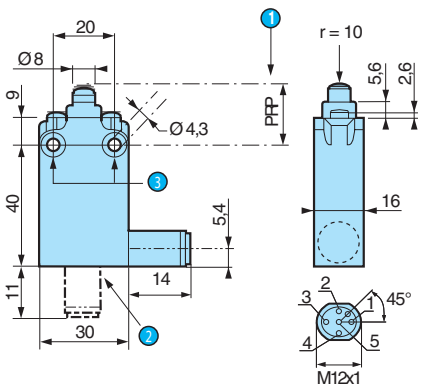
➜ Product

83 870 3/Cable output



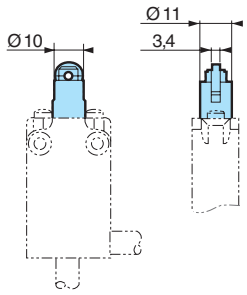
1 See sequence diagram
2 Rear output on request
3 Ø 8 x 4.3 - 4 counterbores

83 870 3/Connector output

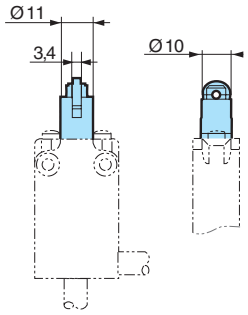


1 See sequence diagram
2 Rear output on request
3 Ø 8 x 4.3 - 4 counterbores

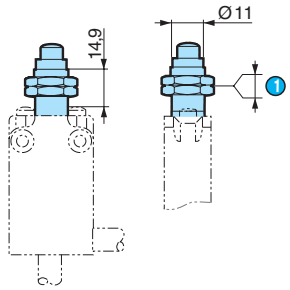
83 871 3



83 875 3

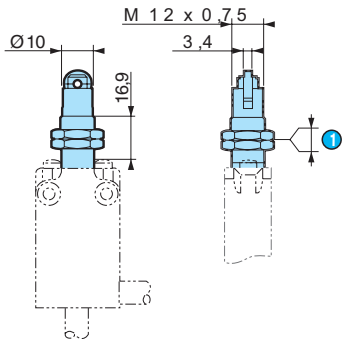


83 874 3



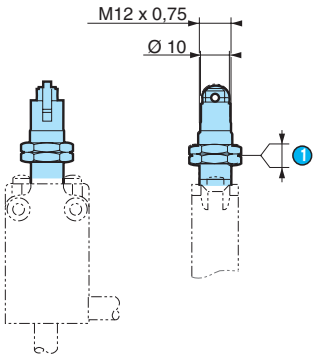
1 Max.tightening thickness 10.5

83 872 3



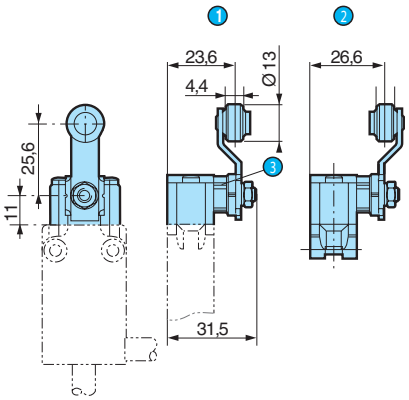
1 Max.tightening thickness 10.5

83 876 3



1 Max.tightening thickness 8.5

83 873 3



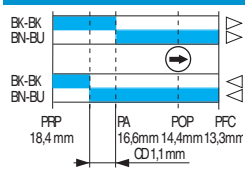
1 Offset A
2 Offset B

Compact limit switch conforming to NFC 63 145

➜ Series 83 880 with cable output

- IP 66/67
- Metal case
- cUL approval

Main specifications

Characteristics	Type of output	Metal plunger
Standard	Cable length 1 m	83 880 101
Standard	Cable length 2 m	83 880 102
Standard	Cable length 3 m	83 880 103
Standard	Cable length 6 m	83 880 106
Plunger with 90° roller	Cable length 1 m	-
Plunger with 90° roller	Cable length 2 m	-
Plunger with 90° roller	Cable length 3 m	-
Plunger with 90° roller	Cable length 6 m	-
Mechanical characteristics		
Sequence Snap action		

Minimum operating force (N)	10
Minimum operating force (Nm)	-
Minimum total travel force (N)	30
Minimum total travel force (Nm)	-
Min. positive opening travel (N)	28
Min. positive opening travel (Nm)	-
Mechanical life millions of operations	10
Vertical approach speed	1 mm/min → 0.5 m/s
Horizontal approach speed (30° cam)	-
Weight (g)	190

General characteristics

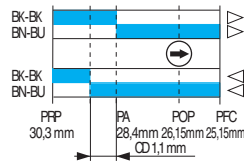
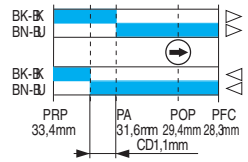
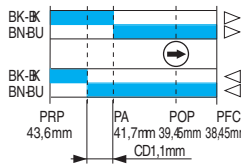
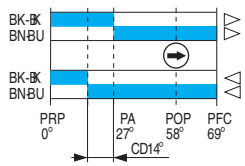
Assigned impulse voltage (Uimp) - V	2500
Assigned insulation voltage (Ui) V	500
Thermal current (Ith) A	10
Low-load switching - Minimum voltage (V)	10
Low-load switching - Minimum current (mA)	100
Assigned working characteristics (EN 60 947.5.1, UL 508)	A300 = AC15 250 V 6 A Q150 = DC13 24 V 8 A
Use category according to IEC 947.5.1	AC15=250 V/6 A DC13=24 V/8 A
Use category according to UL 508	A300 - Q150
Electrical protection	Integral earth wire Short-circuit protection device : IEC/EN 60947.5.1 Fuse 6 AgC
Approvals	UL 508, UL 50

Product adaptations

- Contact type
- Rear output
- Protective scraper seal
- Length of cable/connector/stripping
- Connector output
- Low level contact

To order, see page 12



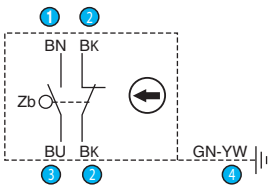

Metal roller plunger	Metal plunger with threaded barrel	Roller plunger - metal with threaded barrel	Steel metal roller lever (2 directions of attack)
83 881 101	**83 884 101**	**83 882 101**	**83 883 101**
83 881 102	**83 884 102**	**83 882 102**	**83 883 102**
83 881 103	**83 884 103**	**83 882 103**	**83 883 103**
83 881 106	**83 884 106**	**83 882 106**	**83 883 106**
83 885 101	-	**83 886 101**	-
83 885 102	-	**83 886 102**	-
83 885 103	-	**83 886 103**	-
83 885 106	-	**83 886 106**	-
			
10	10	10	-
-	-	-	0.15
30	30	30	-
-	-	-	0.35
28	28	28	-
-	-	-	0.15
10	10	10	10
1 mm/min → 0.5 m/s	-	1 mm/min → 0.5 m/s	1 mm/min → 0.5 m/s
1 mm/min → 0.3 m/s	1 mm/min → 0.3 m/s	1 mm/min → 0.3 m/s	-
200	220	220	230

Principles

Function

Four-terminal double break two-way contact element (form Zb) with positive opening NC contacts. The 2 moving contacts are electrically isolated from one another.

Snap-action contact

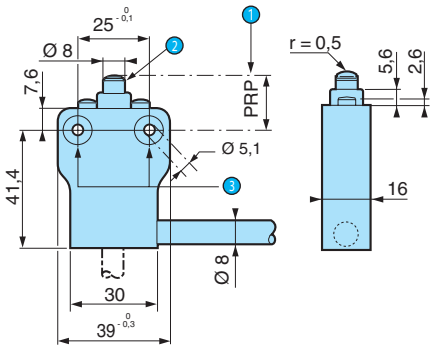


1. Brown
2. Black
3. Blue
4. Green-yellow

Dimensions

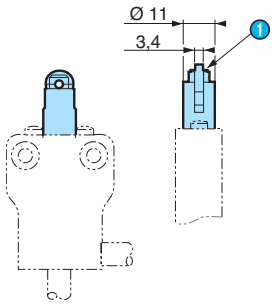
➜ Product

83 880 1



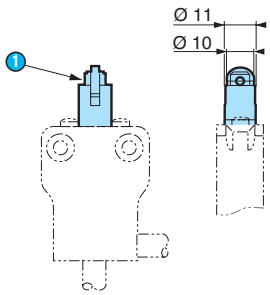
1. See sequence diagram
2. POP marking
3. Ø 10 x 5.1 - 4 counterbores

83 881 1



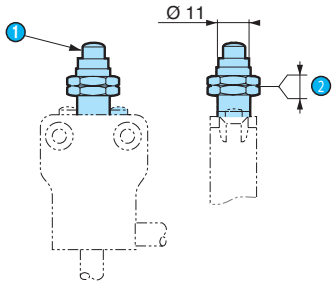
1. POP marking

83 885 1



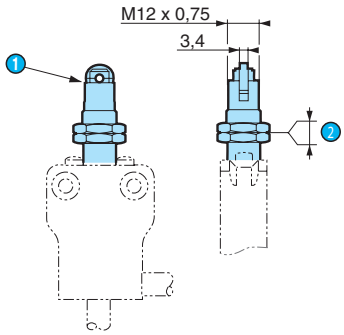
1. POP marking

83 884 1



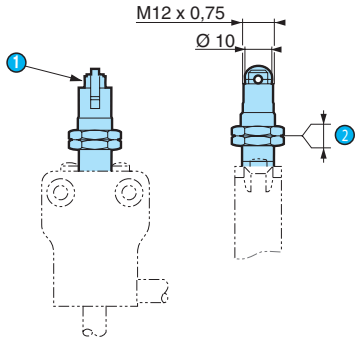
1. POP marking
2. Max.tightening thickness 8.5

83 882 1



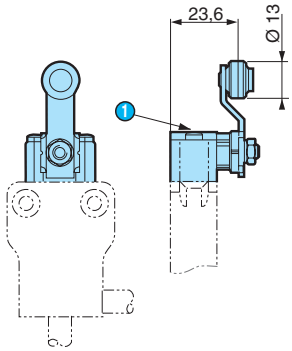
1. POP marking
2. Max.tightening thickness 10.5

83 886 1



1. POP marking
2. Max.tightening thickness 10.5

83 883 1



1. POP marking

Miniature protected limit switch

➜ Series 83 581

- Compact dimensions
- Contact element : IP67

Main specifications

Features	Function	Telescopic top-mounted plunger	Plunger with axial roller	Plunger with 90° roller
Standard	I (Changeover)	**83 581 0**	**83 581 1**	●
Dual-current	I (Changeover)	**83 581 8**	**83 581 9**	●
Mechanical characteristics				
Minimum operating force (N)		5	5	5
Minimum total travel force (N)		20	20	20
Differential travel (mm)		1	1	1
Minimum operating travel mm		2.5	2.5	2.5
Maximum total travel mm		5	5	5
Mechanical life (operations)		10^5	10^5	10^5
Operating temperature (°C)		-20 → +85	-20 → +85	-20 → +85
Weight (g)		40	45	45
Connections				
Wire output on right		D	D	D
Wire output on left		G	G	G
Cable output		C	C	C

General characteristics

General characteristics	
Conformity to standards	NFC 20030 class II
Degree of protection IEC 60529	Outer casing : IP57 Contact element : IP67
Electrical characteristics	
Assigned operating current (Ie)	Standard : 8 A - 250 VAC Bi-niveau : 0.1 A - 250 VAC
Electrical endurance - Standard (operations)	8 A - 250 VAC : 40000 5 A - 250 VAC : 100000
Electrical endurance - Dual-current	This version is designed to operate both on dual-current (1 mA 4 V minimum) and medium-current (5A) circuits. However, a given product should only be used to switch one type of circuit during its working life.
Connections	
Connection	Flexible leads : PVC 3x1 mm^2 - Length 0.50 m - ext. Ø 2 mm (on the right or left) Cable : 3x0.75 mm^2 - Length 0.50 m - ext. Ø 5 mm (on left only)

Product adaptations

- Length of cable/connector
- Approvals

To order, see page 12

Principles

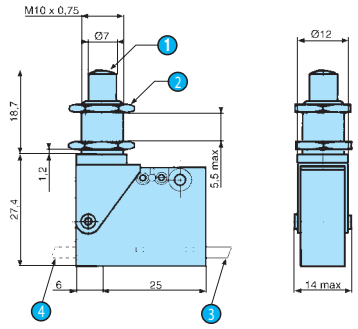
Function
Single break two-way contact element (form C : changeover)

1. Black (common)
2. Brown (NC)
4. Blue (NO)

Dimensions

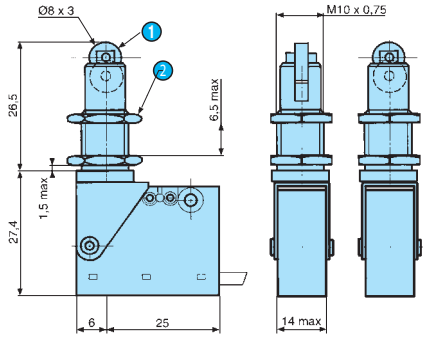
➜ Product

83 581 0 / 83 581 8



1. R10 spherical
2. Nuts 14 across flats Thickness 2
3. Output on right
4. Output on left

83 581 1 / 83 581 9



1. Roller is straight (standard) or at 90°
2. Nut 14 across flats
   Thickness 2

Limit switch for severe environments

➜ Series 83 589

■ **Press button protected by O-ring and scraper seal**

Main specifications

Housing	Features	Top-mounted plunger
Thermoplastic	Standard	**83 589 031**
Thermoplastic	Dual-current	**83 589 801**
Mechanical characteristics		
Minimum operating force (N)		10
Minimum total travel force (N)		15
Minimum operating travel (mm)		2
Differential travel (mm)		0.1
Maximum total travel (mm)		4.5
Mechanical life (millions of operations) mini.		10^7
Operating temperature (°C)		-40 → +85
Protection rating		IP66/67
Weight (g)		80

General characteristics

Conformity to standards	NFC 20030 class I (the plunger is operated manually by an earthed metal part, or by an insulated part which provides additional insulation).
Version	Single-pole
Protection	IP66 resistant to hydrocarbons and saline mist (400 hours)
Electrical characteristics	
Electrical endurance	Standard : 8 A 250 VAC : 30.000 operations 200 mA 24 V DC relay load L / R = 3 ms 10^7 operations Dual-current : 1 mA 4 VAC : 10^7 operations 200 mA 24 V DC relay load L / R = 3 ms 5 x 10^6 operations 5 A 250 VAC : 30.000 operations
Dual-current	This version is designed to operate both on dual-current (1 mA 4 V minimum) and medium-current (5A) circuits. However, a given product should only be used to switch one type of circuit during its working life.
Connections	
Cable	PVC Ø5 - 3 x 0.75 mm² Length 0.50 m Conforming to NFR 13414/13415
Mounting	Max. tightening torque 9 Nm

Principles

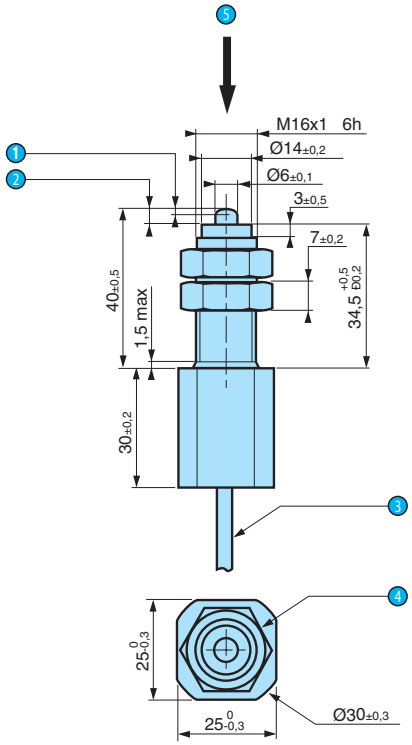
Function
Single break two-way contact element (form C : changeover)

1. Black (common)
2. Grey (NC)
4. Blue (NO)

To order, see page 12

Dimensions

➜ Product



1. Operating travel
2. Total travel
3. Cable Ø5 - 3 x 0.75 mm²
   Length 0.50 m
4. 21 across flats
5. Direction of operation

Precision limit switch

➜ Series 83 731/83 732/83 733

■ **Adjustable threaded barrel fixing**

Main specifications

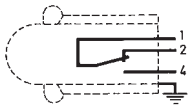
	Top-mounted plunger	Top-mounted plunger with roller	Top-mounted plunger
Version			
Single-pole	**83 731 3**	**83 732 3**	**83 733 3**
General characteristics			
Minimum operating force (N)	15	15	6
Minimum total travel force (N)	35	35	25
Differential travel (mm)	2	2	1.5
Minimum operating travel (mm)	0.2	0.2	0.2
Maximum total travel (mm)	6	6	4
Mechanical life (millions of operations) mini.	10^6	10^6	10^6
Operating temperature (°C)	-5 → +70	-5 → +70	-5 → +70
Protection °C	IP66	IP56	IP56
Weight (g)	110	120	70

General characteristics

Conformity to standards	NFC 20030 : Class I (the plunger is operated manually by an earthed metal part or by an insulated part which provides additional insulation).
Protection	IP 56 - IP 66 depending on type
Version	Single-pole
Function	3-terminal single break two-way contact element (form C : changeover)
Electrical characteristics	
Assigned operating current (Ie)	5 A / 250 V
Thermal current (Ith) A	12
Connections	
Cable	PVC (A05 - VV - F) , length 0.50 m 3 conductors cross-section 0.75 mm² Sheathed ext. Ø : 7.6 mm
Electrical protection	Earthing terminal for version 83 731 and 83 732
Approvals	CSA

Principles

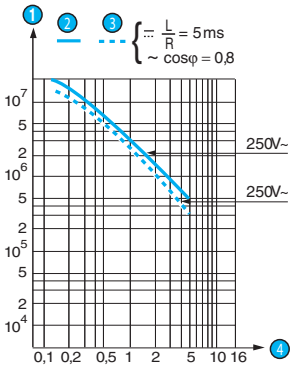
Function
3-terminal single break two-way contact element (form C : changeover).



1. Black (common)
2. Brown (NC)
4. Blue (NO)

To order, see page 12

Curves

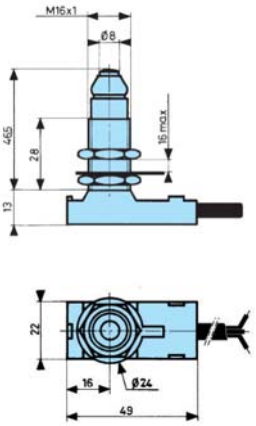


1. Number of operations
2. Resistive circuit
3. Inductive circuit
4. Current in Amps

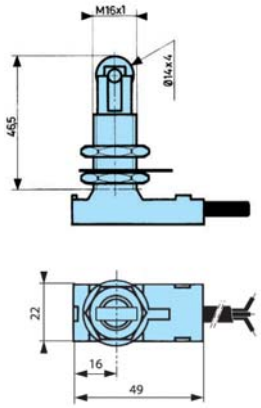
Dimensions

➜ Product

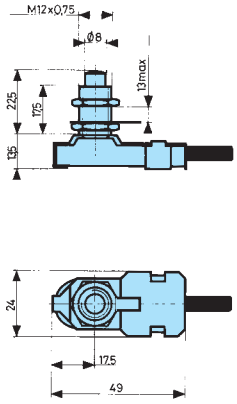
83 731 3



83 732 3



83 733 3



Miniature limit switch

➜ Series 83 800 with plug-in body

- **Thermoplastic case**
- **Compact dimensions**

Main specifications

Housing	Features	Top-mounted plunger	Top-mounted plunger with roller, threaded barrel	Rotary head, momentary action to right and left
Thermoplastic	Plug-in body	**83 800 101**	**83 802 001**	**83 803 001**
General characteristics				
Minimum operating force (N)		10	10	7
Minimum total travel force (N)		22	22	18
Minimum operating travel (mm)		1.5	1.5	15
Differential travel (mm)		0.4	0.4	6
Maximum total travel (mm)		5	5	60
Mechanical life (millions of operations) mini.		10^7	10^7	10^7
Operating temperature (°C)		-10 → +70	-20 → +70	-20 → +70
Protection rating		IP65	IP55	IP55
Weight (g)		50	57	60

General characteristics

Conformity to standards	NFC 20030 class I IEC 356.1 - EN 60204.1
Protection	Single-pole
Electrical characteristics	
Assigned insulation voltage (Ui) V	250
Thermal current (Ith) A	10
Assigned operating current (Ie)	5
Connections	
Cable	On connector : W1 screw terminals - max. wire cross-section 2.5 mm²
Connection	For No. 9 sealing gland, 15.2 Ø, 1.411 pitch
Approvals	UL/CSA please consult us

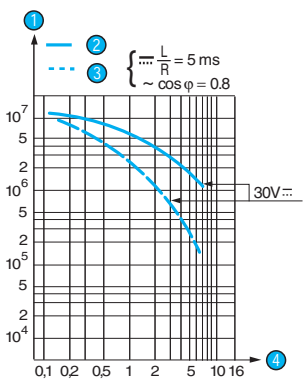
Principles

Function
Four-terminal double break two-way contact element (form Za). The contacts must be of the same polarity.

A - For 83 803

B - Other types

Curves



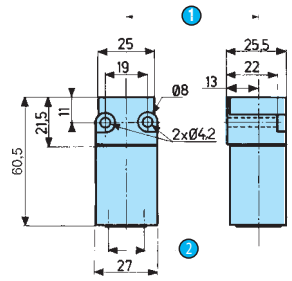
1. Number of operations
2. Resistive circuit
3. Inductive circuit
4. Current in Amps

To order, see page 12

Dimensions

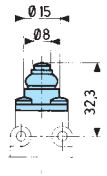
➜ Product

Casing

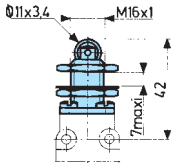


1 Axis of head rotation
2 For No. 9 sealing gland

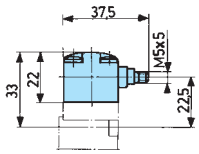
83 800 1



83 802

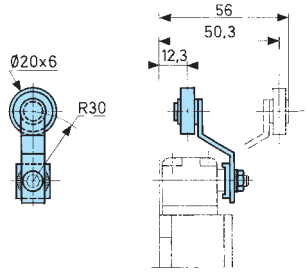


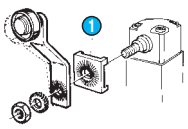
83 803



➜ Mounting accessories

79 210 997 (for 83 803)

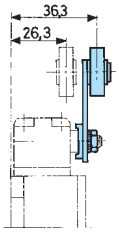


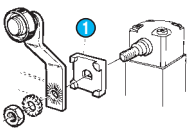


1 Block 1

Lever settings or positions dictated by direction in which block 1 is fitted

79 210 998 (for 83 803)





1 Block 1

Other information

Accessories for 83 803
Galvanized, passivated steel lever
Thermoplastic roller
Supplied with nut, washer and locating block loose

Safety limit switch

➜ Series 83 893 plastic safety interlock switch, no locking
➜ Series 83 893 plastic solenoid locking switch
➜ Series 83 894 metal interlock switches
➜ Series 83 893 plastic, for hinged guards
➜ Series 83 894 metal without locking

Environment	
Conforming to standards Products	IEC 947-5-1, EN 60 947-5-1, UL 508, CSA C22-2 no. 14, JIS C4520 (cf. 3/4)
Conforming to standards Machine assemblies	IEC 204-1, EN 60 204-1, EN 1088, EN 292
Certifications	UL, CSA
Protective treatment in normal operation	"TC"
Temperature Use (°C)	-25 → +70
Storage temperature (ºC)	-40 → +70
Vibration resistance according to IEC 68-2-6	5 gn (10...500 Hz)
Schok resistance according to IEC 28-2-27	10 gn (duration 11 ms)
Degree of protection according to IEC 529 and IEC 947-5-1	IP 67
Cable entry	Sealing gland 11
Electrical characteristics	
Assigned working characteristics	AC 15 A 300 Ue = 240 V, Ie = 3A or Ue = 120 V, Ie = 6 A DC 13 Q 300 Ue = 250 V, Ie = 0.27 A or Ue = 125 V, Ie = 0.55 A
Assigned insulation voltage according to IEC 947-5-1	Ui = 500 V
Assigned insulation voltage according to UL 508, CSA C22-2 no.14	Ui = 300 V
Assigned impulse voltage according to IEC 947-5-1	Uimp = 6 KV
Thermal rating according to IEC 947-5-1	Ithe = 10 A
Electric shock protection Class 2 according to IEC 536	•
Resistance between terminals according to IEC 954-5-4	≤ 30 mΩ
Protection against short circuits	Cartridge fuse 10 A gG (gI)
Connection Screw clamp terminals	•
Clamping capacity with or without ferrule	min 1x0.5 mm^2, max ex 1.5 mm^2
Electrical life according to IEC 947-5-1 appendix C	•

Safety limit switch

➜ Series 83 893 plastic safety interlock switch, no locking

- **Key-operated safety interlock switches for monitoring moving guards**
- **Plastic bodies and heads**
- **Heads have 4 possible positions**
- **Positive opening contacts**

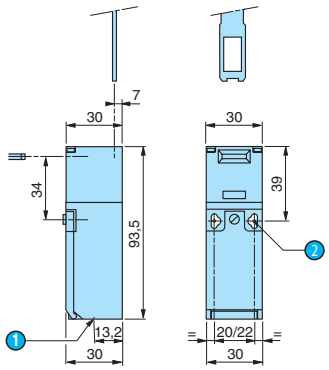
Main specifications

		83 893 0 2-pole	83 893 1 3-pole
Type of contacts	**Action**		
NC+NO break before make	Slow action	**83 893 001**	-
NC+NC	Slow action	**83 893 010**	-
NC+NO+NO (2NO break before make)	Slow action	-	**83 893 120**
NC+NC+NO (NO break before make)	Slow action	-	**83 893 130**
General characteristics			
Maximum actuation speed		0.5 m/s	0.5 m/s
Minimum actuation speed		0.01 m/s	0.01 m/s
Resistance to removal of key		10 N	10 N
Mechanical life (operating cycles)		10^{6}	10^{6}
Minimun operating frequency (operating cycles per hour)		600	600
Minimum positive opening force		15 N	15 N
Cable entry according to NFC 68 300		1 PG 11	2 PG 11
Thermal current (Ith) A		10	10
Assigned insulation voltage (Ui) V		500	500
Weight (g)		110	160

Dimensions

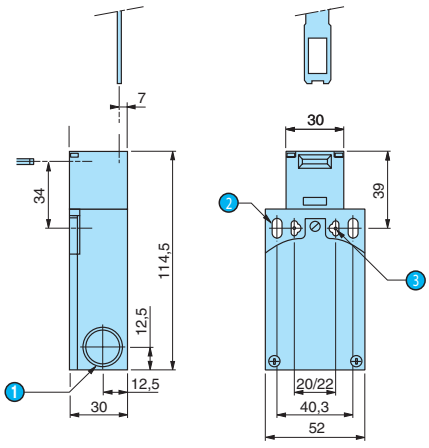
➜ Product

83 893 0



1. 1 threaded hole for cable gland 11
2. 2 slots Ø 4.3 x 8.3 fixing centres 22
   2 holes Ø 4.3 fixing centres 20

83 893 1

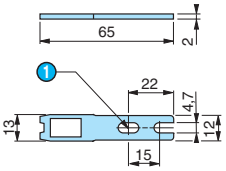


1. 2 threaded holes for cable gland
2. 2 slots Ø 5.3 x 13.3
3. 2 slots Ø 4.3 x 8.3 fixing centres 22
   2 slots Ø 4.3 fixing centres 20

To order, see page 12

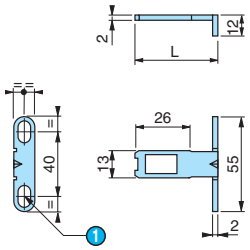
➜ Actuators

Straight key
79 214 581



1 2 slots Ø 4.7 x 10

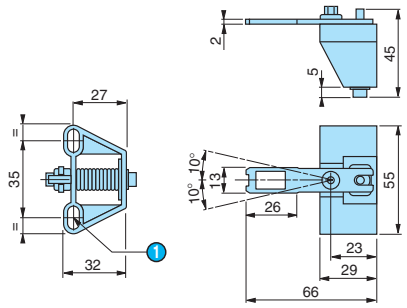
Key with wide fixing bar
79 214 582 / 585



1 2 slots Ø 4.7 x 10

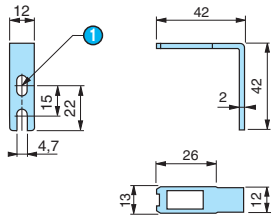
Type 79 214 582 : L = 40 mm
Type 79 214 585 : L = 29 mm

Flexible key
79 214 583



1 2 slots Ø 4.7 x 10

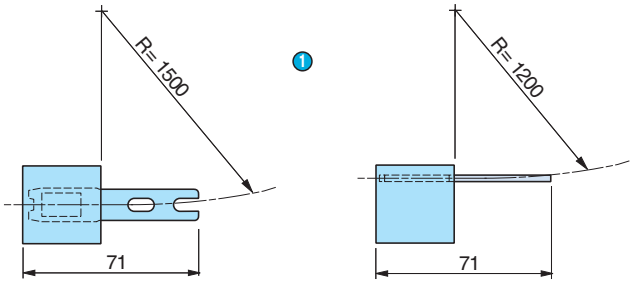
Angled key
79 214 584



1 1 slot Ø 4.7 x 10

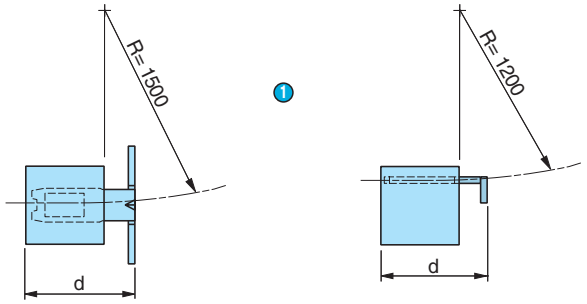
➜ Operating radius

79 214 581



1 R = min. radius

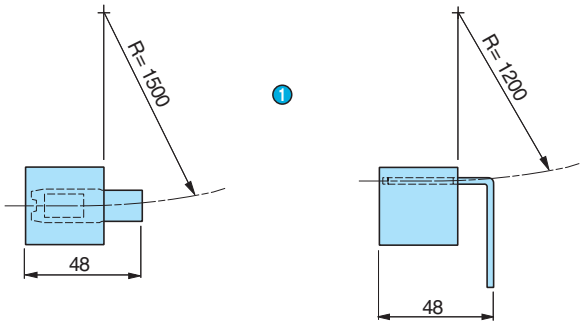
79 214 581



1 R = min. radius

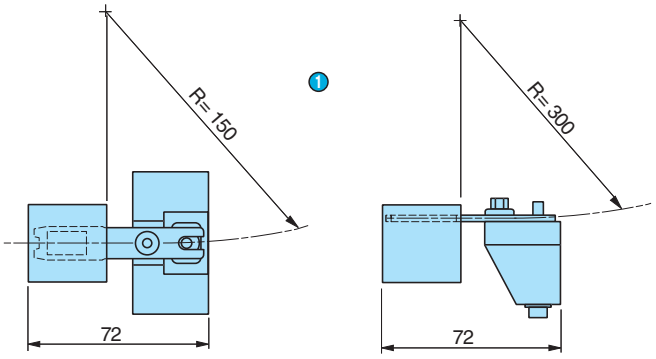
Type 79 214 582 : d = 46 mm
Type 79 214 585 : d = 35 mm

79 214 584



1 R = min. radius

79 214 583



1 R = min. radius

Safety limit switch

➜ Series 83 893 plastic solenoid locking switch

- **Monitoring of moving guards for machines with a stopping time which is greater than the time taken to access the danger zone**
- **Locked by removing the voltage, unlocked by applying voltage to the electromagnet**
- **Plastic heads and bodies**
- **Heads have 4 possible positions at 90°**
- **Positive opening contacts**

Main specifications

		83 893 2 2-pole	83 893 2 2-pole	83 893 2 2-pole
Type of contacts	**Action**			
NC+NO break before make	Slow action	**83 893 201**	**83 893 202**	**83 893 203**
General characteristics				
Electromagnet supply voltage (50/60 Hz in AC)		24 V AC/DC	120 V AC/DC	230 V AC/DC
Maximum actuation speed		0.5 m/s	0.5 m/s	0.5 m/s
Minimum actuation speed		0.01 m/s	0.01 m/s	0.01 m/s
Resistance to removal of key		500 N	500 N	500 N
Mechanical life (operating cycles)		10^6	10^6	10^6
Minimun operating frequency (operating cycles per hour)		600	600	600
Minimum positive opening force		15 N	15 N	15 N
Cable entry according to NFC 68 300		1 PG 11	1 PG 11	1 PG 11
Weight (g)		360	360	360

General characteristics

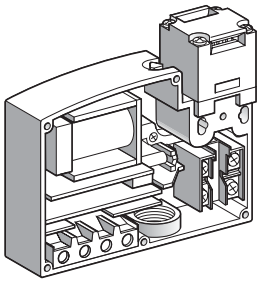
Assigned working characteristics	AC 15 B300 Ue = 240 V, Ie = 1.5 A or Ue = 120 V, Ie = 3A, DC 13 Q300 Ue = 250 V, Ie = 0.27 A or Ue = 125 V, Ie = 0.55 A
Assigned impulse voltage according to IEC 947-5-1	Uimp = 4 KV
Thermal rating according to IEC 947-5-1	Ithe = 6 A

2

To order, see page 12

Principles

Locking/Unlocking using an electromagnet

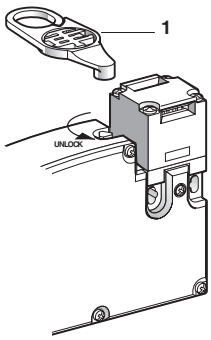


Type 83 893 2 safety switches are fitted with an electromagnet for locking/unlocking the guard.

With the guard locked, the force required to remove the key is **50 daN.**

In addition to the 2-pole contact element actuated by the key, type 83 893 2 limit switches also have a positive break type **"NC" contact** element, **actuated by the electromagnet.**
The "NC" contact is integrated in the machine safety circuit.

Unlocking using a special tool



Type 83 893 2 safety switches are supplied with a tool (1) which can be used to unlock the moving guard, bypassing the electromagnet.

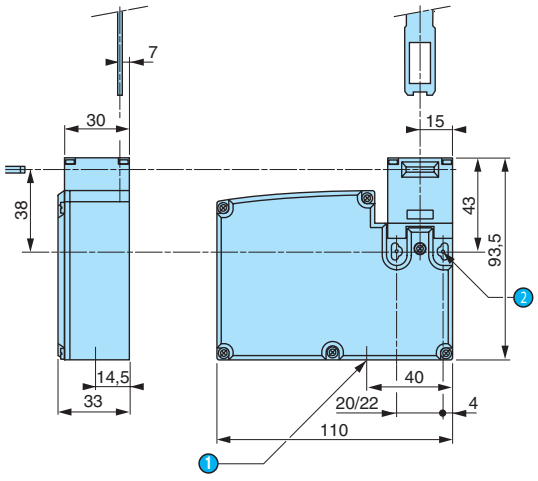
Unlocking using a tool is recommended in the following cases :
- machine maintenance (if the tool is in the "UNLOCK" position and then removed, this will prevent the machine from restarting accidentally, therefore ensuring the safety of maintenance personnel).
- mains failure
- problem with unlocking (locking cannot be released : fail-safe condition). Unlocking by applying power to the electromagnet always takes priority over unlocking using a tool. The "NC" contact is integrated in the machine safety circuit.

Power supply for the electromagnet on 83 893 2
The electromagnet for type 83 893 2 safety switches is supplied by an electronic circuit which increases its service life. As the 24 V version is protected by a **bridge rectifier**, an A.C. or D.C. supply can therefore be used. The 120 V and 230 V versions are A.C. only.
It is also protected against voltage surges.

Dimensions

➜ Product

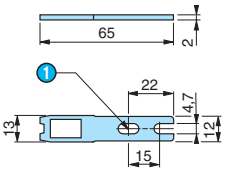
83 893 2



1 1 threaded hole for cable gland 11
2 2 slots Ø 4.3 x 8.3 fixing centres 22 ;
2 holes Ø 4.3 fixing centres 20

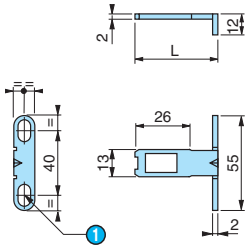
➜ Actuators

Straight key
79 214 581



1 2 slots Ø 4.7 x 10

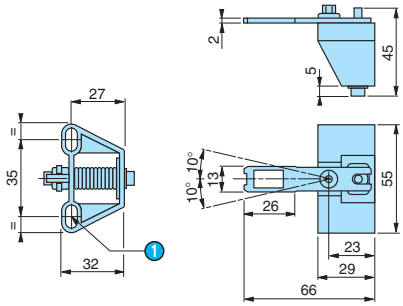
Key with wide fixing bar
79 214 582 / 585



1 2 slots Ø 4.7 x 10

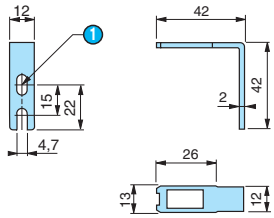
Type 79 214 582 : L = 40 mm
Type 79 214 585 : L = 29 mm

Flexible key
79 214 583



1 2 slots Ø 4.7 x 10

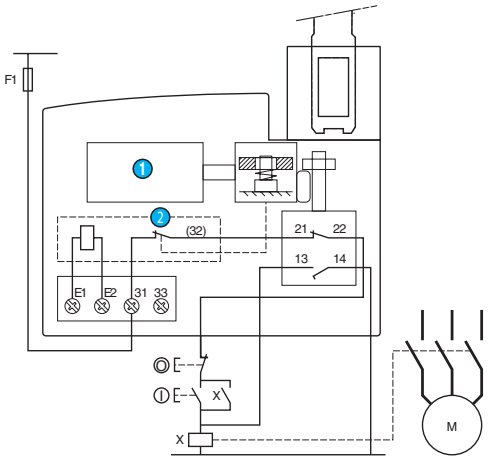
Angled key
79 214 584



1 1 slot Ø 4.7 x 10

Connections

Category 1 connection according to EN 954-1



1 Electromagnet
2 Auxiliary contact
E1-E2 : Power supply for electromagnet
13-14 : Safety contact for redundancy or signalling

Examples of wiring diagrams with a fuse to provide protection against short-circuits in the cable or tampering.

Locked by removal of voltage 83 893 2

Safety limit switch

➜ Series 83 893 plastic, for hinged guards

- Door hinge safety switches for monitoring guards or rotating housings on small machinery
- Plastic bodies and heads
- Stainless steel lever and fixing accessories
- Heads have 4 possible positions at 90°
- Positive opening contacts

Main specifications

Type of contacts	Action	Lever on right 2-pole	Lever in middle 2-pole	Lever on left 2-pole	Rotating shaft length 30 mm 2-pole
NC+NO break before make	Slow action	83 893 301	83 893 302	83 893 303	83 893 401
General characteristics					
Tripping angle		5°	5°	5°	5°
Minimum actuation torque (Nm)		0.1 Nm	0.1 Nm	0.1 Nm	0.1 Nm
Minimum positive opening torque (Nm)		0.25 Nm	0.25 Nm	0.25 Nm	0.25 Nm
Mechanical life (operating cycles)		10^6	10^6	10^6	10^6
Cable entry according to NFC 68 300		1 PG 11	1 PG 11	1 PG 11	1 PG 11
Weight (g)		145	145	145	145

General characteristics

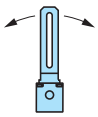
Environment	
Protective treatment in normal operation	"TC" and "TH"
Vibration resistance according to IEC 68-2-6	25 gn (10...500 HZ)
Cable entry	One threaded hole for cable gland 11
Electrical characteristics	
Assigned working characteristics	AC 15 A 300 Ue = 240 V, Ie = 3 A DC 13 Q 300 Ue = 250 V, Ie = 0.27 A
Minimum actuation speed	0.01 m/s

Principles

Lever movement
83 893 301 / 303

1 or

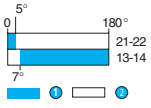
83 893 302



83 893 401

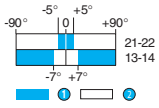
Curves

83 893 301 / 303



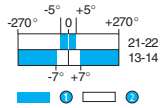
1 closed
2 open

83 893 302



1 closed
2 open

83 893 401



1 closed
2 open

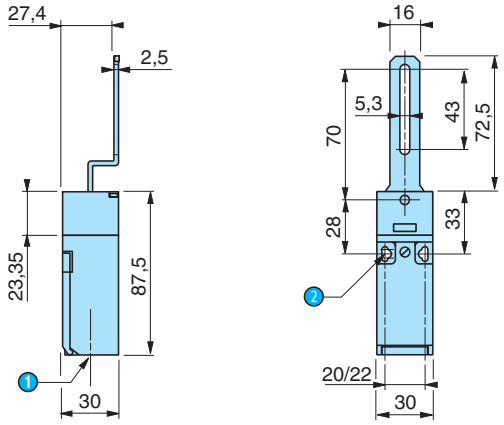
To order, see page 12

Crouzet

Dimensions

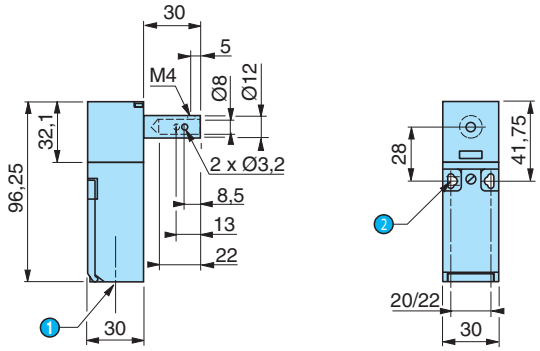
➜ Product

83 893 3



1 1 threaded hole for cable gland 11
2 2 slots Ø 4.3 x 8.3 fixing centres 22 ;
2 holes Ø 4.3 fixing centres 20

83 893 401



1 1 threaded hole for cable gland 11
2 2 slots Ø 4.3 x 8.3 fixing centres 22 ;
2 holes Ø 4.3 fixing centres 20

Safety limit switch

➜ Series 83 894 metal without locking

- **Safety limit switch with tongued key for detecting the moving guard**
- **Metal bodies and heads**
- **Heads have 4 possible positions at 90°**
- **Positive opening contacts**

Main specifications

Type of contacts	Action	83 894 0 3-pole
NC+NO+NO (2NO break before make)	Slow action	**83 894 020**
General characteristics		
Maximum actuation speed		0.5 m/s
Minimum actuation speed		0.01 m/s
Resistance to removal of key		10 N
Mechanical life (operating cycles)		1 million
Minimun operating frequency (operating cycles per hour)		10^6
Minimum positive opening force		20 N
Cable entry according to NFC 68 300		1 PG 13.5
Weight (g)		360

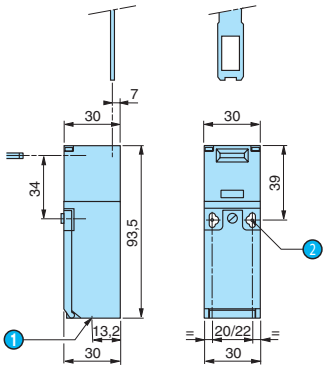
General characteristics

Cable entry according to NFC 68 300	One threaded hole for cable gland 13

Dimensions

➜ Product

83 894 0



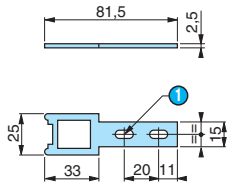
1 1 threaded hole for cable gland 13
2 2 slots Ø 7.3 x 5.3

To order, see page 12

Crouzet

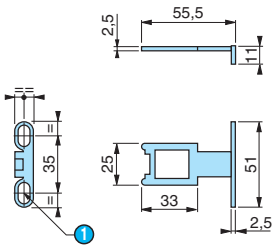
➜ Actuators

Straight key
79 214 578



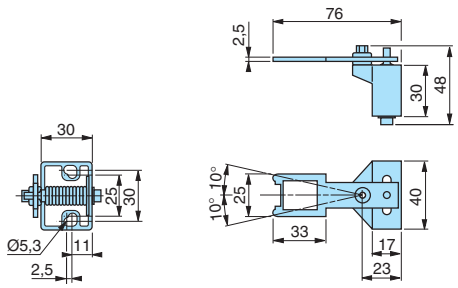
1 2 slots Ø 5.3 x 10

Wide key
79 214 579



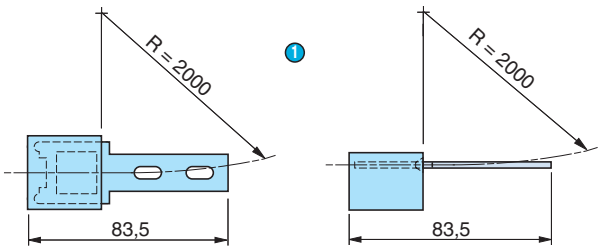
1 2 slots Ø 4.7 x 10

Flexible key
79 214 580



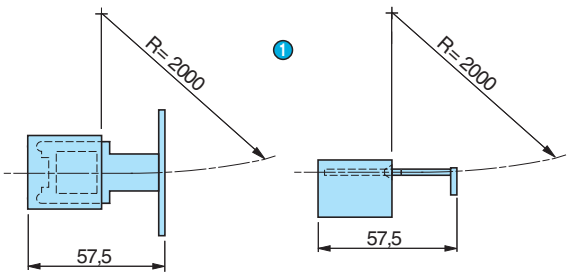
➜ Operating radius

79 214 578



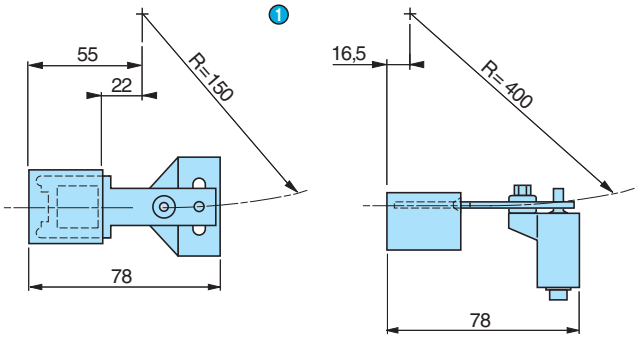
1 R = min. radius

79 214 579



1 R = min. radius

79 214 580



1 R = min. radius

Safety limit switch

➜ Series 83 894 metal interlock switches

- **Monitoring of moving guards for machines with a stopping time which is greater than the time taken to access the danger zone**
- **Locked by removing the voltage, unlocked by applying voltage to the electromagnet**
- **Metal bodies and heads**
- **Heads have 4 possible positions at 90°**
- **Positive opening contacts**

Main specifications

		83 894 120 / 83 894 130 3-pole	83 894 121 / 83 894 131 3-pole	83 894 122 / 83 894 132 3-pole
Type of contacts	**Action**			
NC+NO+NO (2NO break before make)	Slow action	**83 894 120**	**83 894 121**	**83 894 122**
NC+NC+NO (NO break before make)	Slow action	**83 894 130**	**83 894 131**	**83 894 132**
Environment				
Electromagnet supply voltage (50/60 Hz in AC)		24 V AC / DC	120 V AC / DC	230 V AC / DC
Maximum actuation speed		0.5 m/s	0.5 m/s	0.5 m/s
Minimum actuation speed		0.01 m/s	0.01 m/s	0.01 m/s
Resistance to removal of key		2000 N	2000 N	2000 N
Mechanical life (operating cycles)		$>10^6$	10^6	1 million
Minimun operating frequency (operating cycles per hour)		600	600	600
Minimum positive opening force		20 N	20 N	20 N
Cable entry according to NFC 68 300		2 PG 13	2 PG 13	2 PG 13
Weight (g)		1140	1140	1140
Electromagnet characteristics				
Operator factor		100 %	100 %	100 %
Voltage limits		-20 % < +10 %	-20 % < +10 %	-20 % < +10 %
Service life		20 000	20 000	20 000
Consumption Inrush		10 VA	10 VA	10 VA
Consumption Sealed		10 VA	10 VA	10 VA
Indicator characteristics				
Assigned insulation voltage according to IEC 947-5-1		50 V	250 V	250 V
Current consumption		7 mA	7 mA	7 mA
Assigned working voltage AC or DC		24 V	110 V / 240 V	110 / 240 V
Voltage limits AC or DC (including ripple)		20...52 V	95...264 V	95...264 V
Service life (h)		100 000	100 000	100 000
Protection against voltage surges		✓	✓	✓

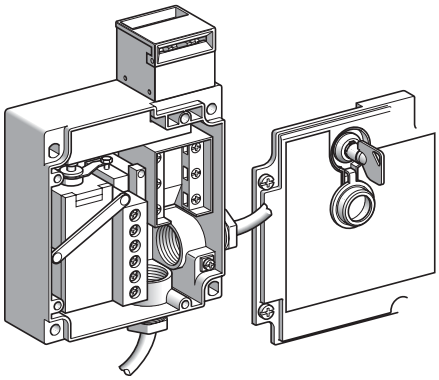
General characteristics

Environment	
Cable entry	One threaded hole for cable gland 13
Electrical characteristics	
Assigned working characteristics	AC 15 B300 Ue = 240 V, Ie = 1.5 A or Ue = 120 V, Ie = 3 A DC 13 Q300 Ue = 250 V, Ie = 0.27 A or Ue = 125 V, Ie = 0.55 A
Assigned impulse voltage according to IEC 947-5-1	Uimp = 4 KV
Thermal rating according to IEC 947-5-1	Ithe = 6 A

To order, see page 12

Principles

Locking/Unlocking using an electromagnet

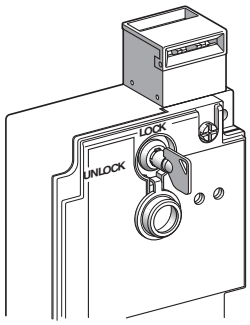


Type 83 894 1 safety switches are fitted with an electromagnet for locking/unlocking the guard.

With the guard locked, the force required to remove the key is **200 daN.**

In addition to the 3-pole contact element actuated by the key, 83 894 2 limit switches also have a positive break type **"NC + NO" contact** element, **actuated by the electromagnet.**
The "NC" contact is integrated in the machine safety circuit, and the "NO" contact indicates the position of the electromagnet.

Key-operated lock on 83 894 1



Type 83 894 1 safety switches are supplied with a key-operated lock which can be used to unlock the moving guard, bypassing the electromagnet.

Unlocking using a key-operated lock is recommended in the following cases :
- machine maintenance (if the key is turned to "UNLOCK" and then removed, this will prevent the machine from restarting accidentally, therefore ensuring the safety of maintenance personnel).
- mains failure
- problem with unlocking (locking cannot be released : fail-safe condition). Unlocking by applying voltage to the electromagnet always takes priority over unlocking using a key-operated lock.

The locking mechanism for standard devices allows the key to be removed in the "LOCK" and "UNLOCK" positions.

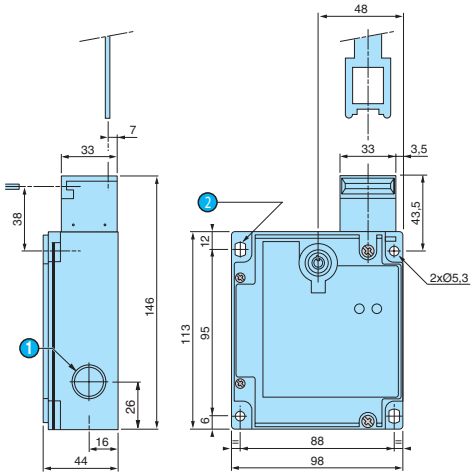
Power supply for the electromagnet on 83 894 1

The electromagnet for type 83 894 1 safety switches runs on D.C. and is therefore particularly reliable.
As it is protected by a **bridge rectifier** A.C. or D.C. supplies can be used (24 V, 48 V, 120 V or 230 V).
It is also protected against voltage surges.

Dimensions

➜ Product

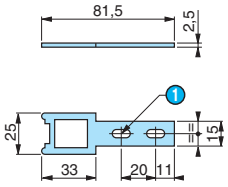
83 894 1



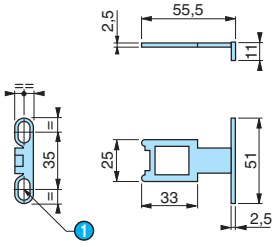
1 1 threaded hole for cable gland 13
2 2 slots Ø 7.3 x 5.3

➜ Actuators

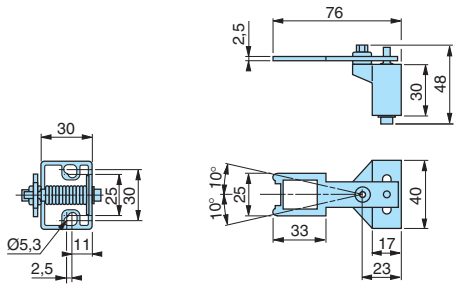
Straight key
79 214 578



Wide key
79 214 579

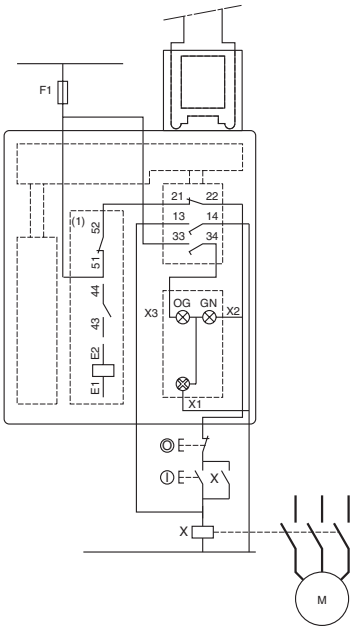


Flexible key
79 214 580



Connections

Category 1 in accordance with EN 954-1



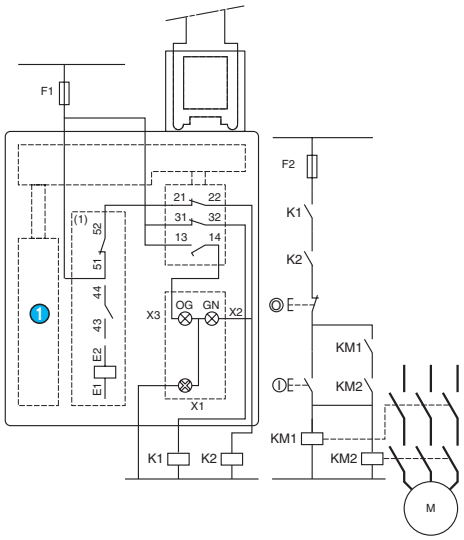
1 Electromagnet
2 Auxiliary contact

E1-E2 : Power supply for electromagnet
43-44 : Electromagnet signal contact
13-14 : Safety contact available for redundancy

Examples of wiring diagrams with a fuse to provide protection against short-circuits in the cable or tampering.

Locking by removal of voltage "NC+NO+NO" 83 894 12

Category 3 according to EN 954-1



1 Electromagnet

33-X1 : LED (orange) : key not inserted
51-X1 : LED (green) : key inserted and locked
21-52 : Safety pre-wiring compulsory

Examples of wiring diagrams with redundancy of the switch contacts, without monitoring.

Locking by removal of the voltage "NC+NC+NO" 83 894 13

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Index by part number

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Création - Conception: Communication Crouzet
Edition - Publication: Link to Business, 3C Evolution, Axess.
Photos - Illustrations: Ginko, Daniel Lattard, Schneider Electric
Impression: Imprimerie Des Deux Ponts

CRZ CP 03

11/2005

Ref. 67 200 05 EN Dépot légal en cours