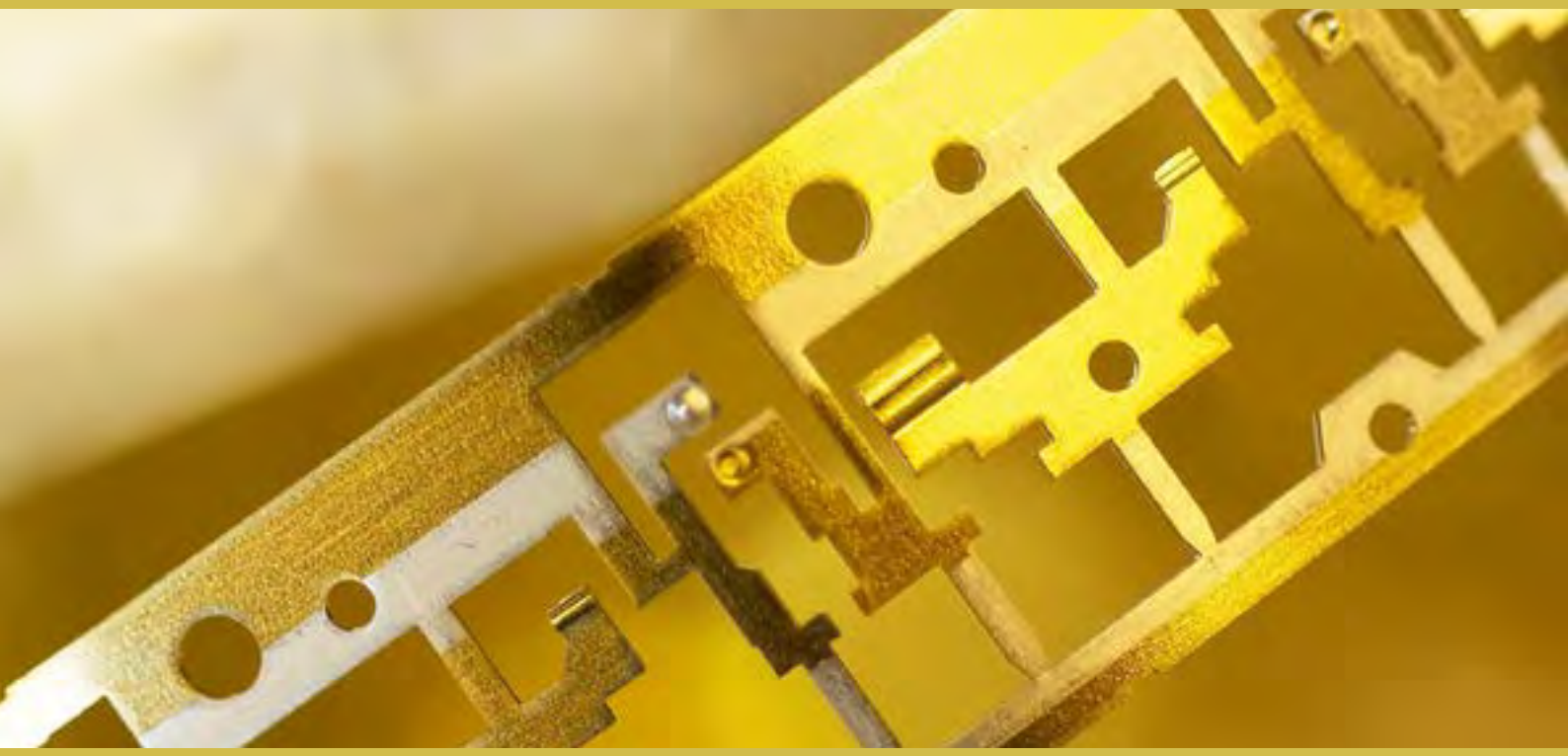
WWW.CROUZET-SWITCHES.COM

SCHALTER UND SENSOREN
PRODUKTÜBERSICHT



› Mikroschalter
› Positionsschalter
› Trim-Schalter und Näherungsschalter

CROUZET SWITCHES

A BRAND OF INNOVISTA SENSORS

SENTRONIC AG Produkte, Support und Service
Rugghölzli 2
CH - 5453 Busslingen
Tel. +41 (0)56 222 38 18
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mailbox@sentronic.com
www.sentronic.com

WER IST CROUZET SWITCHES

Crouzet Switches verfügt über mehr als 60 Jahre Erfahrung in äußerst anspruchsvollen Märkten, in denen Sicherheit und Zuverlässigkeit gefragt sind. Als Anbieter von elektrischen Sprungschalterlösungen bietet Crouzet Switches Entwicklungsingenieuren professionellen Produktsupport, umfassendes Know-How bezüglich anwendungstechnischer Beschränkungen sowie Unterstützung bei der Einhaltung von Normen und Zertifizierungen.

Crouzet Switches ist eine Marke von InnoVista Sensors™.

BRANCHEN

Seit Jahrzehnten beliefert Crouzet Switches Kunden, die Produkte für hochtechnische Anwendungen entwickeln und größten Wert auf überragende Qualität und Zuverlässigkeit sowie die Einhaltung nationaler und internationaler Vorschriften legen. Die Schalter und Sensoren von Crouzet kommen in vielfältigen Anwendungsbereichen zum Einsatz:

› Ventile und Stellglieder
› Kerntechnik
› Elektrische Schaltanlagen
› Schienenverkehr
› Spezialfahrzeuge

INNOVISTA SENSORS

InnoVista Sensors™: Ihr zuverlässiger Partner, mit dem Sie die industriellen Herausforderungen von heute und von morgen meistern.

InnoVista Sensors™ ist ein weltweit tätiger Spezialist für Sensoren, Steuerungen und Aktuatoren für Automationssysteme. Unter den Markennamen Crouzet Aerospace, Crouzet Automation, Crouzet Control, Crouzet Motors, Crouzet Switches und Systron Donner Inertial liefert InnoVista Sensors™ ein breites Sortiment von zuverlässigen, effizienten und anpassbaren Komponenten für die Bereiche Luftfahrt- und Verteidigung, Transport und Industrie.

Basierend auf der anerkannten Kompetenz und Innovationskraft seiner Teams stellt InnoVista Sensors™ seinen Kunden weltweit leistungssteigernde Lösungen zur Verfügung.

www.innovistasensors.com

Entwickelt & Produziert

Sensors | Controls | Actuators

Für

Luftfahrt- und Verteidigung | **Transport** | **Industrie**

Unter Den Markennamen

CROUZET AEROSPACE | CROUZET AUTOMATION | CROUZET CONTROL
CROUZET MOTORS | CROUZET SWITCHES | SYSTRON DONNER INERTIAL

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MIKROSCHALTER UND POSITIONSSCHALTER

	MIKROSCHALTER													POSITIONSSCHALTER								
	Miniatur						Subminiatur			Sub-Subminiatur				Anspruchsvolle Umgebungen			Miniatur					
Serie	*PBX* 8324	83139	83123	*V3S* 83169	83106 83154	*V3/V3D* 83160/260 83161/261	*V4S* 8318	83133	*V4/V4D* 83170/270	*V5S* 8320	83141	83228 83229	83151	8384	SP4522	SP3941 SP3969	8387 8388	83589	8380	83731	SP4863 SP4816	SP4813
Max. Nennstrom bei 250 VAC (A)	10A	6A	10A	8A	16A	25A	10A	6A	12A	4A	5A	5A	5A	10A	1A	1A	10A	8A	6A	10A	1A	1A
Ausführung für niedrige Last	I(mA)	I(mA)		I(mA)	I(mA)	I(mA)	I(mA)	I(mA)	I(mA)	I(mA)	I(mA)	I(mA)	I(mA)		I(mA)	I(mA)	I(mA)	I(mA)	I(mA)		I(mA)	I(mA)
Schutzart	IP65 IP67	IP66 IP67	IP66 IP67 IP69	IP67 IP69			IP67 IP69			IP67 IP69			Hermetisch	IP66	Hermetisch	IP67	IP66 IP67 IP69	IP66 IP67 IP69	IP65	IP66 IP69	Hermetisch	Hermetisch
Doppelunterbrechung	Zb*	Za*			Za*			Za*						Za*			Zb*		Za*			
Bistabil (Rastend)																						
Hochtemperatur (> 125°C)						200°C		150°C	150°C		150°C	140°C	250°C		250°C	200°C					250°C	250°C
Niedrigtemperatur (< -40°C)	-50°C					-60°C					-55°C	-55°C	-55°C		-55°C						-55°C	-55°C
Zwangsöffnung																						
Hohe DC-Schaltleistung Blasmagnet																						
Explosionssicher																						
Zulassung für Kernkraftwerke																						
Hochdruckumgebung Bis 6 bar																						
Zulassungen * anstehend ** fragen Sie uns																						

Za*: Schaltelement mit Doppelunterbrechung und 4 Anschlussklemmen. Die Kontakte haben die gleiche Polarität.

Zb*: Schaltelement mit Doppelunterbrechung und 4 Anschlussklemmen. Die beiden beweglichen Kontakte sind elektrisch getrennt.

NÄHERUNGSSCHALTER

Das umfassende Sortiment an Crouzet Switches Näherungsschaltern reicht von Standardmodellen für die Industrie bis hin zu Hochleistungsschaltern:

- 2- oder 3-Draht-Konfiguration
- Integration zweiteiliger Sensoren mit Fernüberwachungs-elektronik
- MTBF: 300.000 Betriebsstunden
- Temperaturbereich: -65 °C bis +125 °C
- Wasserdichte oder hermetisch abgedichtete Ausführungen
- Betrieb bei hohen Drücken

TRIM-SCHALTER

Crouzet Switches liefert Trim-Schalter mit unterschiedlichen Drucktastern und Schaltkonfigurationen sowie optionale wasserdichte Ausführungen. Die Schalter sind für Luftfahrt- und Militäranwendungen zertifiziert.

- 2 A Nennstrom
- 2, 4 oder 5 Wege
- Ein- oder zweipolig, gemeinsamer oder getrennter Bezugsleiter
- Temperaturbereich: -55 °C bis +85 °C
- Wasserdicht (optional)

DAS RAD DER ANPASSUNG

Anpassung im Dienst des Kunden
Um die Kundenwünsche und Marktanforderungen innerhalb kürzester Zeit zu erfüllen hat Crouzet Switches seine Prozesse so strukturiert, dass verschiedene Arten von Produktkategorien verfügbar sind: Standardprodukte, Produkte mit Mehrwert, angepasste Produkte und Sonderprodukte.
Daraus entstand unsere Produktphilosophie: „das Rad der Anpassung“.

1 STANDARDPRODUKTE

Ein umfassendes Sortiment an verfügbaren Schaltern, wie: Mikroschalter, Endschalter und manuell betätigte Schalter, die sofort zur Verfügung stehen.
Damit können unsere Kunden ihr System schnellstmöglich verwirklichen.

2 PRODUKTE MIT MEHRWERT

Alle unsere Standardprodukte können zusätzliche, werkseitig montierte Hilfs-oder Zubehörteile, einschließlich Anschlüssen, Leitungen, Spezialklemmen, Befestigungen, Hebel usw. erhalten. Nahtlose Integration in die Anwendung heißt: Kunden profitieren von vereinfachter Logistik und optimaler Systemzuverlässigkeit.

3 ANGEPASSTE PRODUKTE

Von Beginn eines Projekts an arbeiten Experten von Crouzet Switches eng mit dem Team des Kunden zusammen, um dessen Spezifikationen umzusetzen.
Alle unsere Entwicklungs-, Industrialisierungs-und Genehmigungskompetenzen fließen in die Entwicklung maßgeschneiderter Lösungen ein.

4 SONDERPRODUKTE

Komplette Koordination zwischen dem Projektteam des Kunden und unseren Spezialisten. Diese kundenspezifischen Produkte haben genau die passende Performance und Funktionalität, die für die Anwendung benötigt werden.

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WER SIND WIR?

Crouzet Switches bietet mit seiner Spezialisierung auf die Schnappschalter-Technologie hochwertige Schalt- und Erfassungslösungen in Form von Mikroschalter, Positionsschalter, handbetätigter Schalter und Sensoren an.

Crouzet Switches ist Hauptlieferant der wichtigsten Hersteller und Zulieferer sowie Wartungsdienstleister großer nationaler und internationaler Unternehmen und garantiert als solcher die Lieferung von Bauteilen während der gesamten Lebensdauer der Anlagen.

Die Mikroschalter und Positionssensoren von Crouzet Switches sind in verschiedenen Bordgeräten der Fahrzeuge zu finden sowie in bestimmten Steueranlagen. Als echte sicherheitskritische Bauteile erfassen sie sicher Positionen und schalten hohe und geringe Ströme innerhalb der Anwendungen.

Sie wurden für den Einsatz in anspruchsvollsten Umgebungsbedingungen entwickelt und entsprechen den Bahnnormen im Hinblick auf die Brand- und Rauchfestigkeit, die Stoßfestigkeit, Schwingungen und elektrische Ermüdung.

Crouzet Switches ist weltweit im Bahnsektor vertreten und passt seine Produkte an die Besonderheiten der Lastenhefte seiner Kunden unter Berücksichtigung der strengsten Qualitätsanforderungen und Normenänderungen an.

CROUZET SWITCHES IST MITGLIED DES VERBANDES DER FRANZÖSISCHEN EISENBAHNINDUSTRIE (FIF) UND DEM US-AMERIKANISCHEN «RAILWAY SUPPLIER INSTITUTE» (RSI).

fédération des industries ferroviaires "Les voies du progrès"

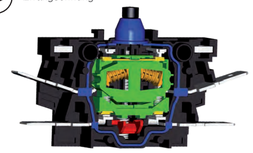
RAILWAY SUPPLY INSTITUTE

PBX secure

Schalter mit Zwangsöffnung

Die Schalter mit Zwangsöffnung PBX Secure wurden für die Anforderungen der Bereiche Industrie und Bahnwesen entwickelt und sind für den langfristigen Einsatz in erschwerter Umgebung geeignet.

Zwangsöffnung



EIN ZUVERLÄSSIGER MECHANISMUS

Der patentierte und bewährte Zwangsöffnungs-mechanismus des PBX (EP 11227362) entspricht der Norm IEC 60947-5-1, Anhang K.

SNCF

Die Schalter PBX Secure sind von der französischen Bahn (SNCF) für Bahnanwendungen zugelassen. (Referenzunterlagen: 10-5312 235)

TECHNISCHE DATEN

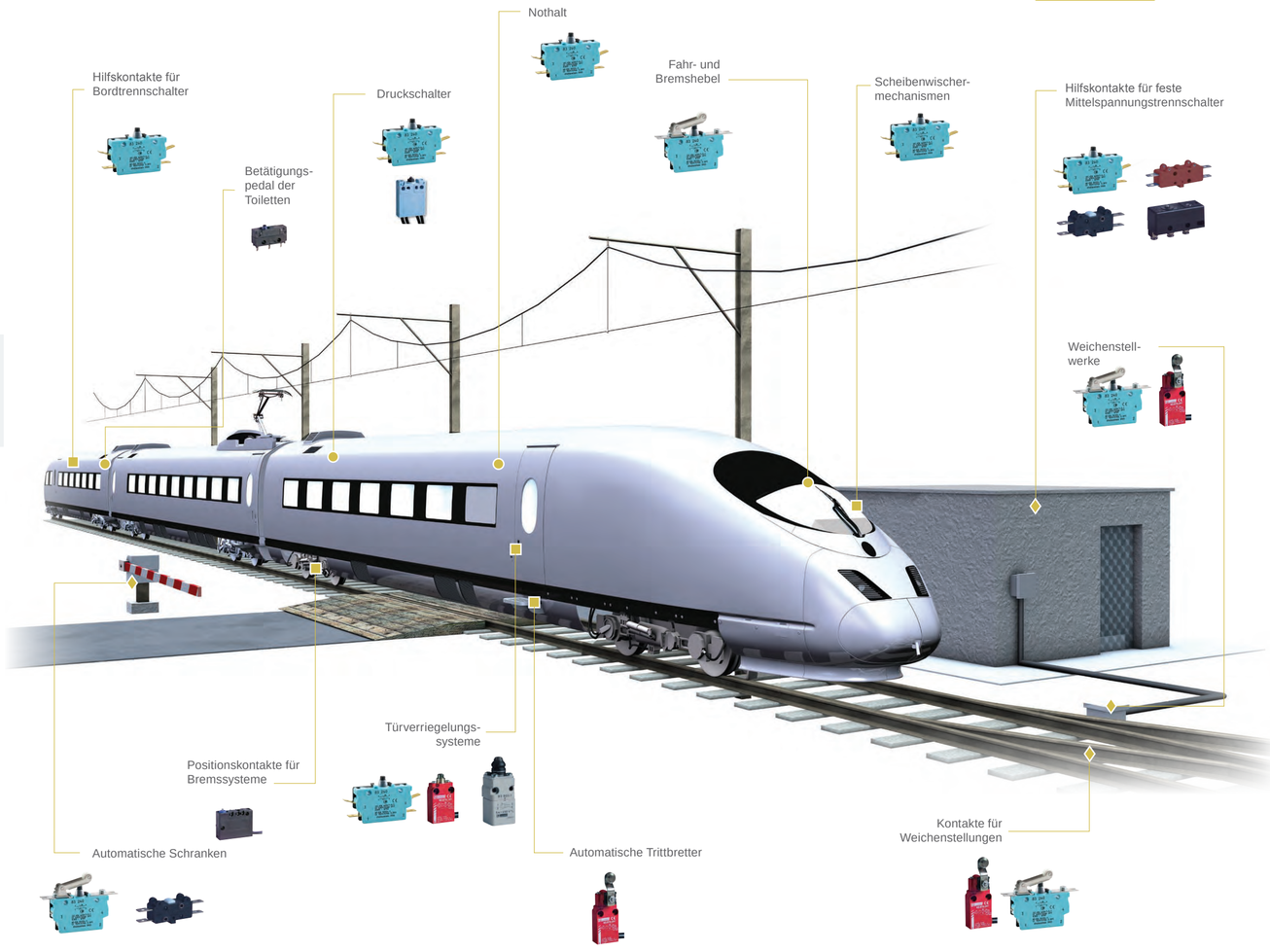
- Umschalter 1 NO + 1 NC galvanisch getrennt (Form Zb) mit Zwangsöffnung
- Fire/smoke EN 45545, NFF 16/101/102 (I3/F1)
- Ausführungen in IP40 bzw. IP67/IP65
- Betriebstemperatur von -50 °C bis +85 °C
- Großer Nachlaufweg nach der Zwangsöffnungsposition
- Standard-Ausführung oder Ausführung mit niedriger Schaltleistung (10 mA / 24 V DC)

CROUZET SWITCHES

A BRAND OF INNOVISTA SENSORS

DAS SCHALTER-ANGEBOT VON CROUZET FÜR DAS BAHNWESEN...

- Karosserie
- Fahrgastzelle
- Infrastruktur



AUSWAHL AN SPRUNGSCHALTERN

MIKROSCHALTER

■ ● ♦ PBX Secure 8324x - Doppelte Unterbrechung, Zwangsöffnung

› Max. Schaltvermögen 10 A bei 250 VAC
› Umschalter mit doppelter Unterbrechung (SPDT-Form Zb) und Zwangsöffnung Separate NO/NC-Kreise
› Schutzart IP67/IP65. Ausführung mit niedriger Schaltleistung
› Steckanschlüsse (Litzenanschluss EN5306: auf Anfrage). Hebel. Montageplatten

♦ 83106 - Doppelte Unterbrechung, Tast- oder Rastfunktion

› Max. Schaltvermögen 10 A bei 250 VAC
› Umschalter mit doppelter Unterbrechung (SPDT-Form Za)
› Mehrpolige Ausführungen auf Metallplatten
› Breite Auswahl an Stelliedern für symmetrische Montage

● 83139 - Doppelte Unterbrechung, Schutzart IP67, Draht-/Kabelausgang

› Max. Schaltvermögen 6 A bei 250 VAC
› Umschalter mit doppelter Unterbrechung (SPDT-Form Za)
› Zweipolige Ausführung (DPDT-Form Za)
› Auf Anfrage: Us Halogenfreie Kabel oder Litzen nach EN 50306

♦ 83118 - Hochempfindlich

› Max. Schaltvermögen 10 A bei 250 VAC
› Kurzer Differenzweg: max. 0,09 mm
› Geringe Betätigungskraft: max. 1,5 N
› Große Auswahl an Betätigungszubehör

■ V3S 83169 - Miniatur, Schutzart IP67, Draht-/Kabelausgang

› Max. Schaltvermögen 8 A bei 250 VAC
› Ausführung mit Bl-Niveau von 1 mA 4 VDC bis 5 A 250 VAC
› Ausführung mit kurzem Differenzweg, Teleskop-Stößel, Hebel...
› Auf Anfrage: Us Halogenfreie Kabel oder Litzen nach EN 50306

♦ 83154 - Doppelte Unterbrechung, hohes Schaltvermögen bei Gleichspannung

› Max. Schaltvermögen 5 A bei 250 VDC
› Umschalter mit doppelter Unterbrechung (SPDT-Form Za) mit Blasmagnet
› Mehrpolige Ausführungen auf Metallplatten
› Große Auswahl an Betätigungszubehör

● V4S 8318x - Subminiatur, Schutzart IP67

› Max. Schaltvermögen 10 A bei 250 VAC
› Ausführung mit Bl-Niveau von 1 mA 4 VDC bis 5 A 250 VAC
› Sondermodelle: einfache Installation, flexible Hebel,...
› Steckanschlüsse oder Litzen-/Kabelausgänge (halogenfrei auf Anfrage)
› Große Auswahl an Betätigungszubehör für 2 verschiedene Befestigungspositionen

POSITIONSSCHALTER

■ ♦ 8387x und 8388x - Kabelausgang, Zwangsöffnung

› Max. Schaltvermögen 10 A bei 250 VAC. Niedrige Schaltleistung
› Umschalter mit doppelter Unterbrechung (SPDT-Form Zb) und Zwangsöffnung. Separate NO/NC-Kreise
› IP66/67 Metallgehäuse
› Große Auswahl an Betätigungszubehör
› Auf Anfrage: Us Halogenfreie Kabel oder Litzen nach EN 50306

■ 8380x - Steckschalter

› Max. Schaltvermögen 5 A bei 250 VAC
› Umschalter mit doppelter Unterbrechung (SPDT-Form Za)
› IP65 Kunststoffgehäuse
› Große Auswahl an Betätigungszubehör
› Kundenspezifische Anpassung: halogenfreier Kabelausgang

** Zulassung ausstehend*

Als Hilfskontakte sorgen die Mikroschalter von Crouzet Switches in verschiedenen Geräten wie Trennschaltern, Überlastschaltern und Sicherungseinsätzen für die Anzeige elektrischer Zustandsänderungen oder das Senden von Informationen darüber. Sie übermitteln dem Wartungspersonal oder Überwachungszentren den aktuellen Gerätestatus.

Egal, ob in Hoch-, Mittel- oder Niederspannungsanwendungen: Die Mikroschalter von Crouzet Switches arbeiten zuverlässig und gewährleisten während der gesamten Lebensdauer der Anlagen einen sicheren Betrieb.

In Abhängigkeit der geschalteten Ströme und des erforderlichen Sicherheitsgrads erfüllen die Produkte die technischen und normativen Anforderungen der Elektrogeräte (Blasmagnet, Zwangsöffnung, UL-/CCC-Zulassung).

DAS RAD DER ANPASSUNG

Crouzet Switches hat ein beträchtliches Fachwissen bezüglich der Produktanpassung auf Basis seiner Standardbaureihen angesammelt sowie große Kompetenz für Vorprojekte zu neuen Programmen entwickelt.

SONDERPRODUKTE

Komplette Koordination zwischen dem Projektteam des Kunden und unseren Spezialisten. Diese kundenspezifischen Produkte haben genau die passende Performance und Funktionalität, die für die Anwendung benötigt werden.

STANDARDPRODUKTE

Ein umfassendes Sortiment an verfügbaren Schaltern, wie: Mikroschalter, Endschalter und manuell betätigte Schalter, die sofort zur Verfügung stehen.

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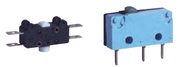

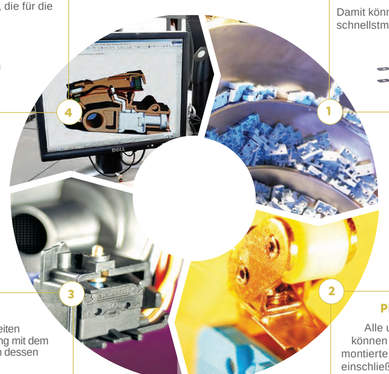

ANGEPASSTE PRODUKTE

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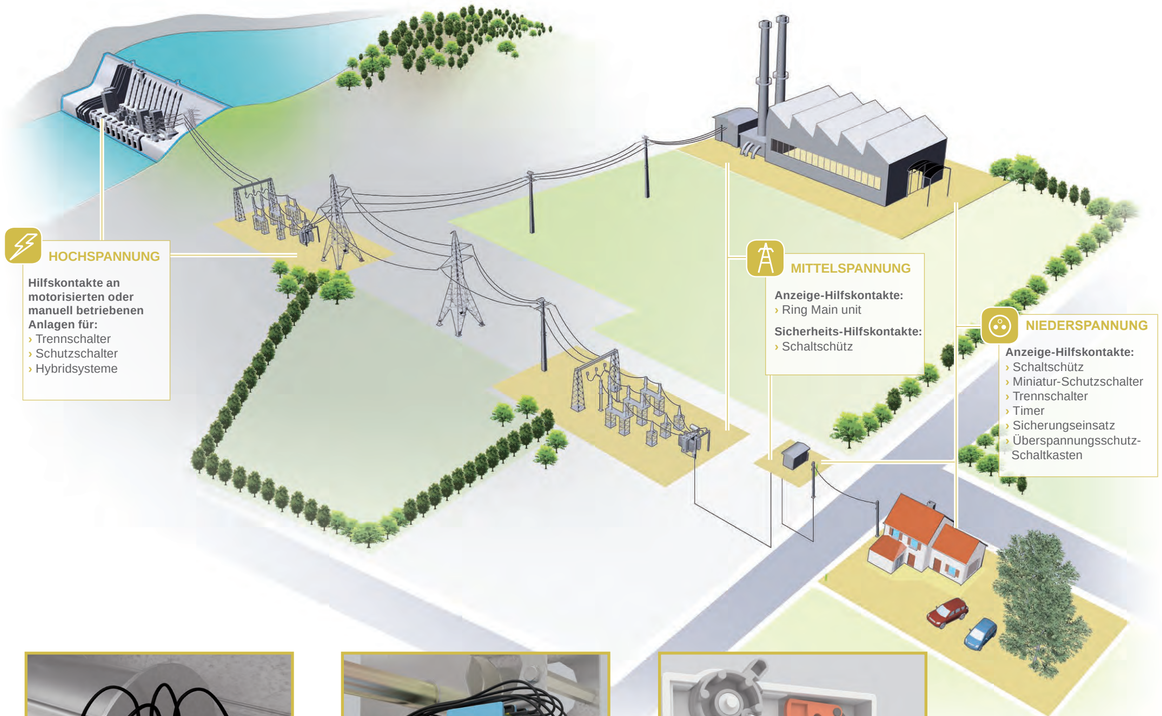
PRODUKTE MIT MEHRWERT

Alle unsere Standardprodukte können zusätzliche, werkseitig montierte Hilfs-oder Zubehörteile, einschließlich Anschlüssen, Leitungen, Spezialklemmen, Befestigungen, Hebel usw. erhalten. Nahtlose Integration in die Anwendung heißt: Kunden profitieren von vereinfachter Logistik und optimaler Systemzuverlässigkeit

SCHALTER UND SENSOREN VON CROUZET IN DER WELT DER ELEKTROGERÄTE



HOCHSPANNUNG

Hilfskontakte an motorisierten oder manuell betriebenen Anlagen für:
› Trennschalter
› Schutzschalter
› Hybridsysteme

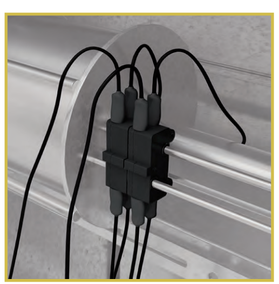
MITTELSPANNUNG

Anzeige-Hilfskontakte:
› Ring Main unit

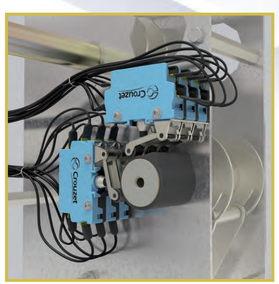
Sicherheits-Hilfskontakte:
› Schaltschütz

NIEDERSPANNUNG

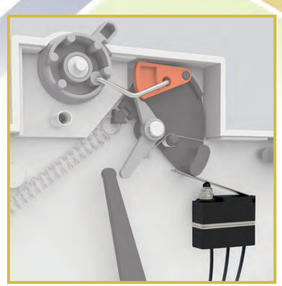
Anzeige-Hilfskontakte:
› Schaltschütz
› Miniatur-Schutzschalter
› Trennschalter
› Timer
› Sicherungseinsatz
› Überspannungsschutz-Schaltkasten



Hilfskontakt (83106) für motorisiertes Steuergehäuse des Hochspannungstrennschalters



Hilfskontakt (PBX) auf Befehlssteuerungs-mechanismus verbunden mit einer Ring Main Unit



Anzeigekontakt (V5E) für Miniatur-Niederspannungsschutzschalter

MIKROSCHALTER MIT SPRUNGMECHANISMUS – AUSWAHL

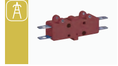
8329 - Miniatur, Betätigungskraft 0,5 bis 4 N. Dichtigkeitsklasse IP 67

› Max Schaltvermögen 10 A 250 VAC
› Steckkontakte & Lötkontakte wahlweise
› 4 mm & 7 mm breite Flachhebel optional

83106 - Doppelte Unterbrechung, bistabil

› Leistung max. 10 A 250 VAC
› Umschalter mit doppelter Unterbrechung (SPDT-Form Za)
› Multipolare Version auf Metallplatten
› Große Auswahl an Betätigungszubehör bei symmetrischer Montage

83154 - Doppelte Unterbrechung, hohes Schaltvermögen bei Gleichspannung



› Leistung max. 5 A 250 VDC
› Umschalter mit doppelter Unterbrechung (SPDT-Form Za) mit Blasmagnet
› Multipolare Version auf Metallplatten
› Große Auswahl an Betätigungszubehör

PBX 8324 - Doppelte Unterbrechung, Zwangsöffnung

› Leistung max. 10 A 250 VAC
› Umschalter mit doppelter Unterbrechung (SPDT-Form Za) mit Zwangsöffnung. Umschalter NO/NC getrennt
› Ausführung mit Abdeckung IP67/IP65 oder Ausführung mit niedriger r Schaltleistung
› Ausgang über Anschlüsse oder Litze. Hebel. Montageplatten

V3 83161 & 83160 - Miniatur, Betätigungskraft zwischen 0,15 und 5 N

› Leistung max. 20 A 250 VAC
› Ausführung mit Bi-Niveau von 1 mA 4 VDC bis 5 A 250 VAC
› Ausführung mit hohem Schaltvermögen bei Gleichspannung mit Blasmagnet
› Ausführung mit Zwangsöffnung
› Betätigungszubehör für verschiedene Befestigungspositionen

V4 83170 - Subminiatur, Betätigungskraft zwischen 0,6 und 2,2 N

› Leistung max. 12 A 250 VAC
› Ausführung mit Bi-Niveau von 1 mA 4 VDC bis 5 A 250 VAC
› Ausführung mit Pilzbetätiger für Betätigung aus mehreren Richtungen (bis zu 45 °)
› Betätigungszubehör für 2 Ankerpositionen

V4E 8318 - Subminiatur, dicht lt. IP 67

› Leistung max. 10 A 250 VAC
› Ausführung mit Bi-Niveau von 1 mA 4 VDC bis 5 A 250 VAC
› Spezielle Ausführungen zur schnellen Befestigung
› Ausgang über Anschlüsse, Litze oder Kabel
› Betätigungszubehör für 2 Ankerpositionen

V5E 8320 - Sub-Subminiatur, dicht lt. IP 67

› Leistung max. 4 A 250 VAC
› Ausführung mit niedriger Leistung von 1 bis 50 mA 4 bis 14 V
› Sehr großer Nachlaufweg: > 2 mm
› Bedienung aus mehreren Richtungen (bis zu 45 °)
› Ausgang über Anschlüsse oder Litze

Anwendungsspezifische Mikroschalter: die optimale Reaktion

› Gemäß Pflichtenheft entwickelte Produkte
› Vollständige Integration in die Anwendung
› Kenndaten nach Bedarf angepasst
› Klemmleiste integriert
› Bewährte oder innovative Mechanismen

** beantragt*

THE CROUZET SWITCHES OFFER FOR VALVES & ACTUATORS

Crouzet Switches has worked closely with its customers for many years in the design and production of switching and detection components.

With a presence in the valves field, Crouzet Switches makes its technical and industrial expertise available to its customers, that is based on a wide range of microswitches and limit switches. These are for use in the most demanding systems, in explosive atmospheres (ATEX/IECEx) and in nuclear environments (K1/K2/K3) complying with RCCE regulations.

From adapted components to specific products, Crouzet Switches has just the solution for the technical and economic requirements of applications ranging from switching high currents to integration into the latest generation mechatronic modules to the development of robust products for severe environments.

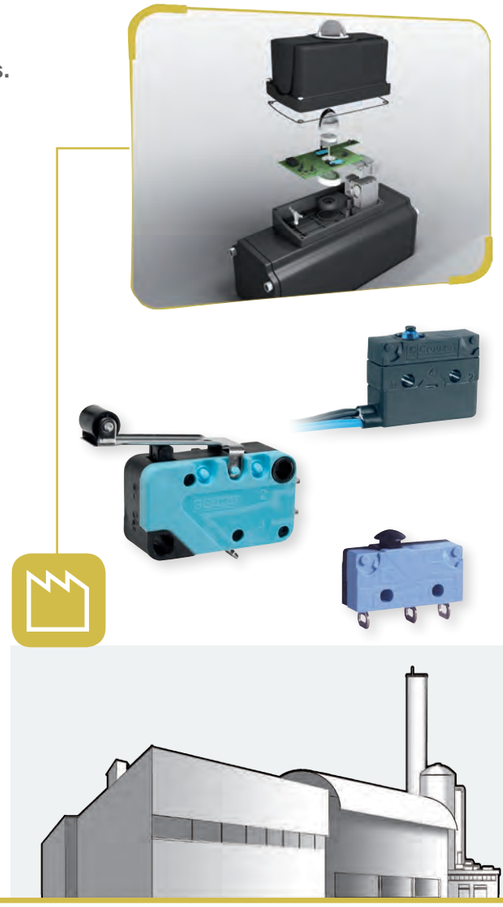
Throughout the lifetime of the application, Crouzet Switches conducts qualification/approval tests and monitors the characteristics of its products.

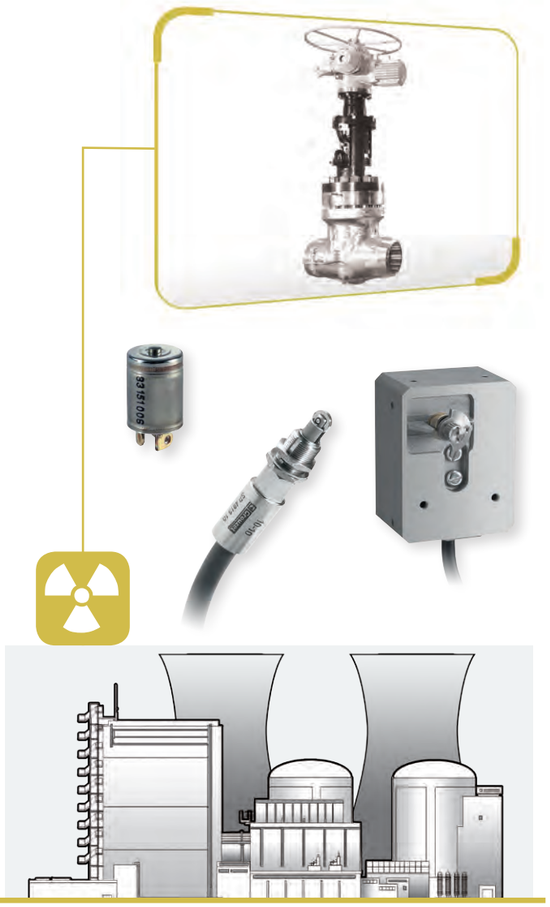
The Crouzet Switches laboratory is compliant with NF EN ISO 17025.

It is certified:

- CTDP (Client Test Data Program) by Underwriters Laboratory (UL) for electical tests in accordance with UL1054 standard and CSA C22.2N°55.
- SMT (Supervised Manufacturer's Testing) by Laboratoire Central des Industries Electriques (LCIE) for electrical tests in accordance with EN 61058-1 and IEC 61058-1.

Crouzet Switches currently supplies electromechanical components to more than 60 valve and actuator manufacturers worldwide, including the market leaders.





VALVES AND ACTUATORS

The application areas (industrial, explosive atmospheres, nuclear, etc.) require very high quality levels. Crouzet Switches products comply with the standards and certifications established by national and international bodies.

MICROSWITCHES FOR INDUSTRIAL APPLICATIONS

83106	Double break bi-stable microswitch	cULus, CCC*
83133	Double break bi-stable microswitch	cULus, CCC*
83161	V3 standard miniature microswitch	cULus, K1/08
831607	V3 miniature microswitch with positive opening action	cULus, CCC*
83170	V4 standard subminiature microswitch	cULus, K1/08
83181	V4 sealed subminiature microswitch	cULus, K1/09
83200	V5 sealed sub-subminiature microswitch	cULus, CCC*
831395	Low temperature sealed double break microswitch	cULus, CCC
831392	Double insulated sealed double break microswitch	cULus, CCC
831398	2-pole synchronised switching microswitch	–

** Approval pending*

LIMIT SWITCHES FOR EXPLOSIVE ATMOSPHERES

831391	Sealed double break microswitch	Ex, IECEx
8399 Ex	**Family**	Ex, IECEx
	SP3941 Aluminium & bronze limit switches	Ex, IECEx
	SP3969 Aluminium & bronze limit switches	Ex, IECEx
	SP3990 Stainless steel limit switch	Ex, IECEx

LIMIT SWITCHES FOR NUCLEAR ENVIRONMENTS

83151	Hermetically sealed cell	CCC*
8399 Nuc	**Nuclear family**	CCC*
	SP4522 Nuclear limit switch, aluminium or bronze	CCC*
	SP4813 Nuclear limit switch, cylindrical with cable output	CCC*
	SP4863 Nuclear limit switch	CCC*

** Approval pending*

DETECTION FOR INDUSTRIAL
VALVES & ACTUATORS

There are several types of industrial valves:

› **Pneumatic**

› **Electric**

› **Hydraulic**

› **Manual valves**

For electrical operation totally integrated in the valve body, the position of the motorized device is detected mechanically by microswitches and their function is to directly cut the phases of the motor (for example, an asynchronous motor).

Regardless of the type of operation used, some valves are equipped with a positioning unit that is used to display the open/closed state of the valve and send this information electrically to its actuator control, and also to perform supervisory functions.

It is therefore necessary to have very precise detection. The switching directly effects the kinematics of the valve, and thus the flow of the fluid.

Crouzet Switches microswitches are designed to perform snap-action switching.

The switching from one state to another takes place in a few milliseconds, over several million cycles with excellent repeatability.

DETECTION/SWITCHING FOR ELECTRIC VALVE ACTUATORS

For electric geared motors, Crouzet Switches offers mainly the 83139 microswitch and its variants.
With its special format and variety of fixings, it is easy to integrate in a mechanism that may require maintenance.

This microswitch can switch high currents (6 A max.), and has a dust and liquid proof casing.

› IP 67

› Double break switching

› Low temperature version (-40 °C)

› Double insulated version

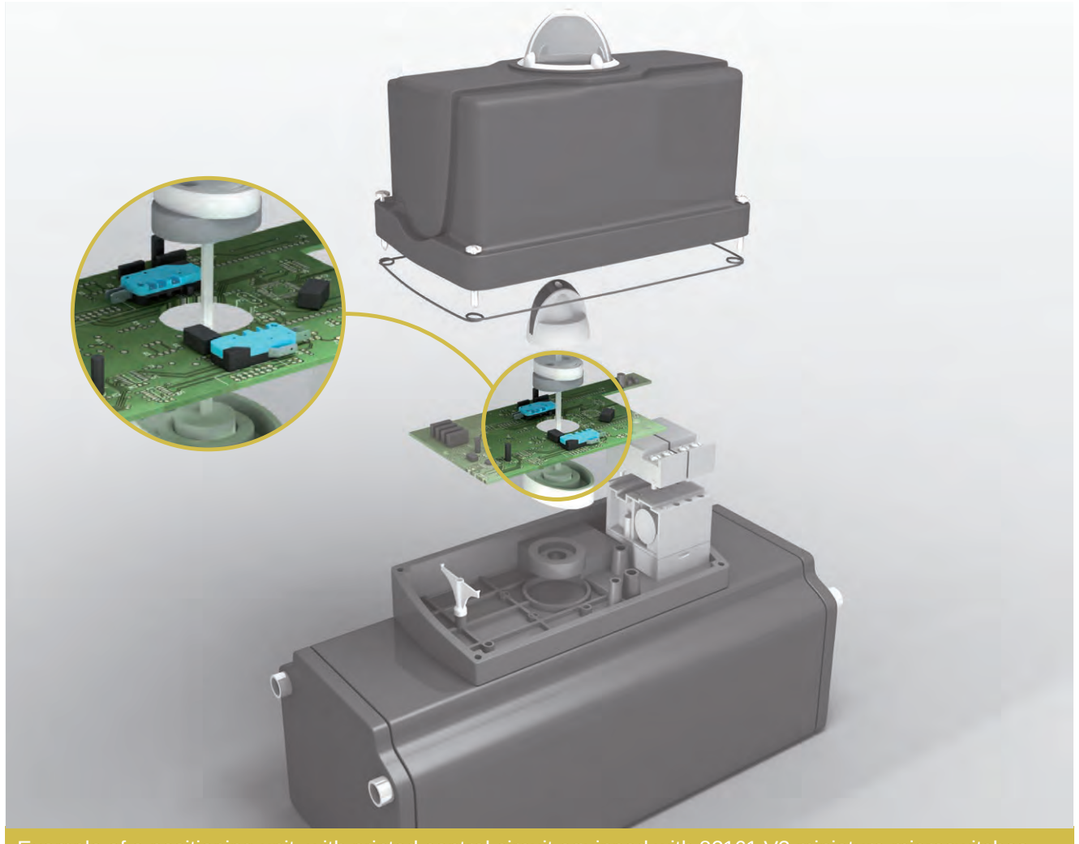
› 2-pole version with synchronized switching

831395 low temperature

831392 double insulated

831398 2-pole with synchronized switching

VALVES AND ACTUATORS



Example of a positioning unit, with printed control circuit equipped with 83161 V3 miniature microswitches

DETECTION/SWITCHING UNITS FOR POSITIONING

For positioning units, Crouzet Switches offers a range of compact microswitches and several connection configurations specially designed for electronic boards and wave soldering.

Crouzet Switches products have been qualified over millions of cycles to ensure their switching reliability even after many years of operation.

› Compact size

› Special connections for printed circuits

› Wide range of levers

› IP 67 sealed versions

› UL approved, EN 60947-5-1 compliant

NON-CONTACT DETECTION TECHNOLOGY

Crouzet Switches also offers detection components with non-contact action for even longer service lives.

› Microswitches

83106

83133

V3 83161

83181

83170

83200

› Sensors

Inductive proximity sensors

DETECTION FOR EXPLOSIVE ATMOSPHERES

VALVES & ACTUATORS

The family of 8399 Ex limit switches have been developed and certified for use in potentially explosive atmospheres, taking into account the standards:

› EN60079-0 - EN60079-1 for the European zone (ATEX)

› IEC 60079-0 and IEC 60079-1 for international area (IECEx).

It comes in three different types: SP3941, SP3969 and SP3990.

All types are built with the same hermetically sealed microswitch encapsulated in a sealed box and called a «hermetic cell».

All products have the same electrical characteristics. The mechanical properties vary depending on the type of SP.

Variations between each type of SP include:

› Material: Stainless steel, aluminium and bronze

› Typical operating style: linear or rotary

› Typical output: wires or cable

› The temperature ranges: different for ATEX and IECEx see tables on the right.

All materials can be combined with all models of operating and output connections. In these combinations, you can add different wires and cables that can be installed on the products.

8399 Ex LIMIT SWITCHES FOR EXPLOSIVE ATMOSPHERES

› **Electrical characteristics**
Rating: 30VDC – 3A, 140VDC – 4mA, 250VAC – 1A

› **Certification**
The 8399 Ex family is:
ATEX certified by: LCIE 02 ATEX 6159X and marked:
CE 0081 II 2 G Ex d IIC T(*) Gb

IECEx certified by: IECEx LCIE 14.0032X and marked:
Ex d IIC T(*) Gb

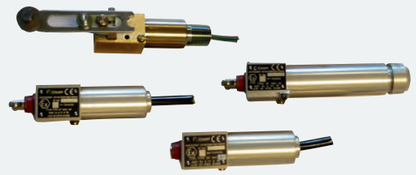
(*) Temperature value by product, see appropriate ambient temperature table below.

› **Table for ATEX certification:**

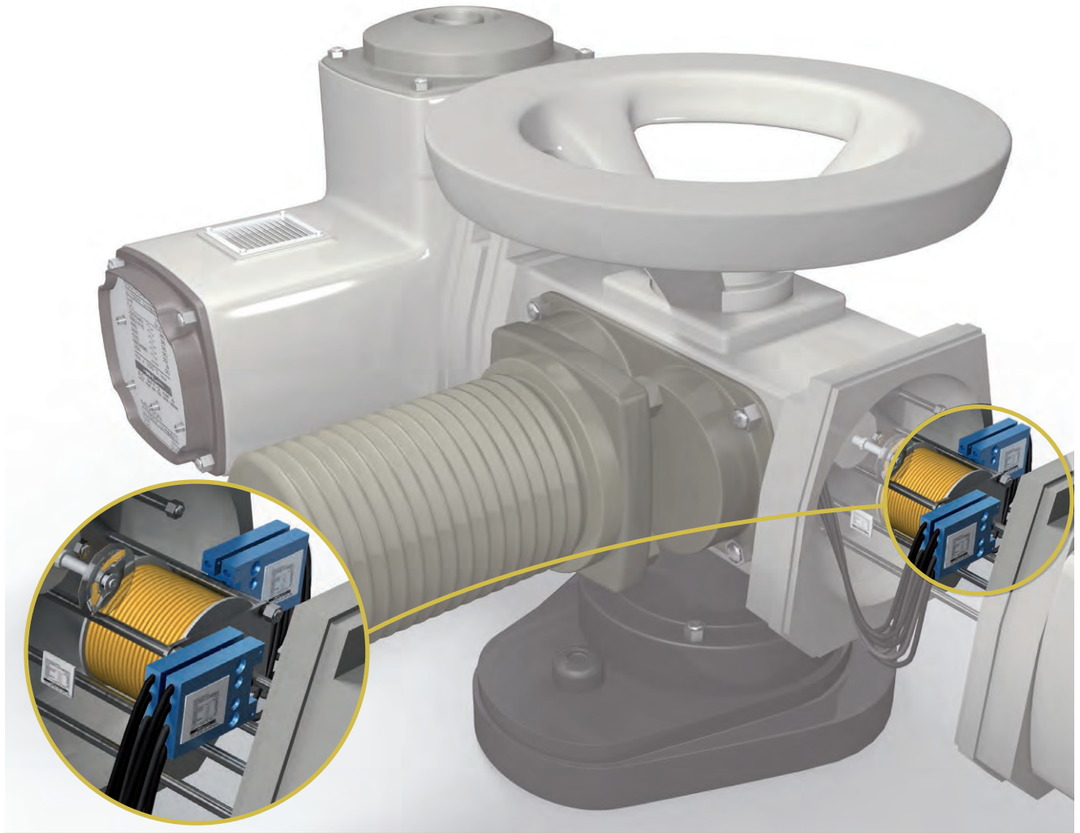
Ambient Temperature	Temperature Class
-40 °C to +60 °C	T6
-40 °C to +75 °C	T6
-40 °C to + 90 °C	T5
-40 °C to + 125 °C	T4
-40 °C to + 190 °C	T3
-40 °C to + 200 °C	T 210 °C

› **Table for IECEx certification:**

Ambient Temperature	Temperature Class
-40 °C to +60 °C	T6
-40 °C to +75 °C	T6
-40 °C to + 90 °C	T5
-40 °C to + 125 °C	T4



8399 Ex limit switches ATEX family
CE test certificate LCIE 02 ATEX 6159X



Example of 1/4 turn ATEX valve, equipped with 831391 ATEX microswitches on the electric geared motor to detect intermediate positions.

DETECTION/SWITCHING FOR ATEX ELECTRIC VALVE ACTUATORS

For valves equipped with an electric geared motor subject to ATEX regulations, Crouzet Switches offers the 831391 ATEX microswitch and its variants.

› IP 67

II 2 G Ex d IIC Gb

› ATEX certificate N°: LCIE 02 ATEX 0034 U

› IECEx certificate N°: IECEx LCIE 13.0035 U

› Ambient temperature: -40 °C up to 70 °C

› CCC certificate: 2011010304487383

› Version cURus approved available

› ROHS compliant

831391 with flat lever

831391 with threaded barrel and metal roller

DETECTION FOR NUCLEAR ENVIRONMENTS

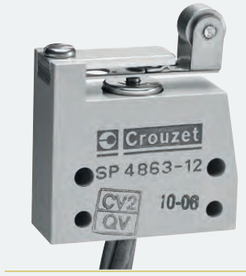
VALVES & ACTUATORS

Crouzet Switches has been involved in the nuclear industry for 35 years, and offers a range of special limit switches. Classified as Electrical Safety Systems, these products are certified in accordance with the RCCE regulations (rules regarding the design and construction of electrical equipment for nuclear islands).

The limit switches comprise a hermetically sealed microswitch (83151) which combines a snap-action switching system, and a high degree of resistance to shocks and vibration. The hermetically sealed microswitch filled with an inert gas (hydrogenated nitrogen) protects the contacts and allows the limit switches to be used in low level circuits and also at higher currents.

This technology enables Crouzet Switches limit switches to be approved for severe environments inside and outside the reactor containment and to meet the requirements of the associated specific tests: Thermal ageing, relative humidity, seismic tests, irradiation ageing tests (K2), irradiation accident tests (K1), resistance tests to thermodynamic and chemical accident conditions (K1).

LIMIT SWITCHES FOR VALVE MOTORIZATION IN K3 ENVIRONMENTS

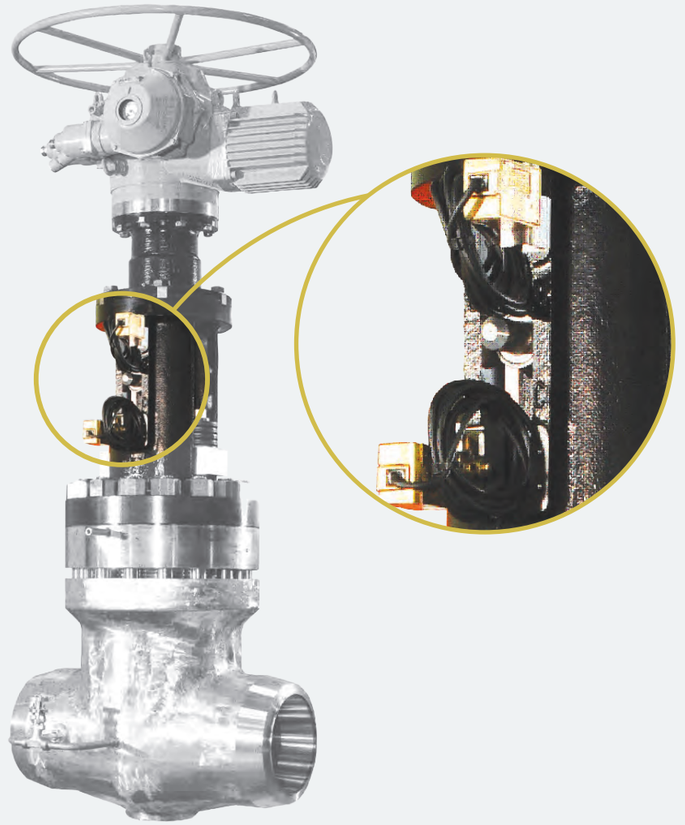


SP 4863 limit switch

- Operates up to a pressure of 1 bar
- Mechanically very robust
- Flexible roller lever fixed to the body
- High seismic resistance
- Operating temperature -55 °C to +105 °C

CLASSIFICATION SUMMARY

8399 Nuc	K1-K2	K3	KBE-EP-154
SP4522	• Bronze	• Aluminium	
SP4813		•	
SP4863		•	
SP4816	•		
83999033			•



Example of a valve located close to a nuclear reactor, equipped with K1 SP4522 certified limit switches

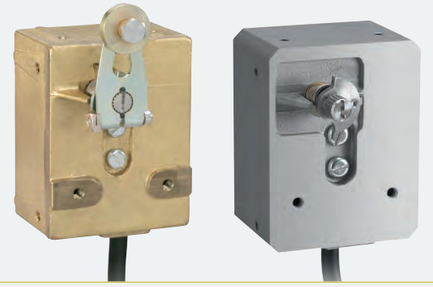
POSITION DETECTION ON THE MAIN VALVE SHAFT IN K1/K2/K3 ENVIRONMENTS

8399 Nuc (nuclear family) limit switches are mounted on the valve frame to detect the positions of the main shaft.

That includes 3 valve positions (open, closed, intermediate) which will provide a very high level of reliability.

SP4816 and SP4813 limit switches

- Operates up to a pressure of 6 bar
- Mechanically very robust with stainless steel body
- Plunger or roller lever that is spring returned to rest position, providing excellent resistance to vibration



SP4522 limit switches

- Single-pole or 2-pole circuit
- Lever adjustable over 360°
- Special cables
- Operates within pressures of between 1 and 6 bar
- CW / CCW actuation

BASIC TECHNICAL CONCEPTS

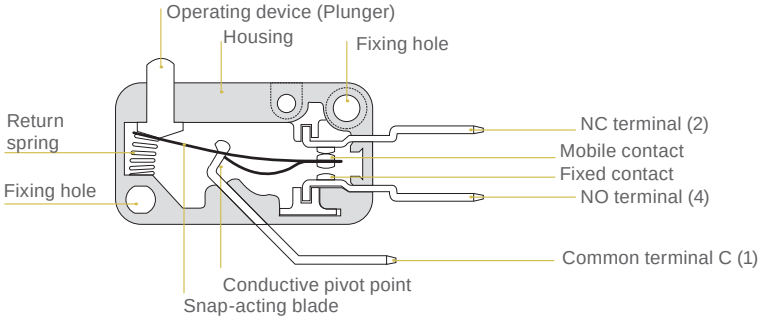
INTRODUCTION

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

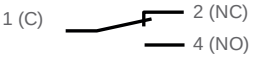
- Fast and reliable switching largely independent of actuating speed
- High electrical ratings but small dimensions
- High repeat accuracy of switching points and forces
- Low operating force
- Short pre-travel but large overtravel
- Very long service life
- Extensive range of connections, fixing means and actuators for easy adaptation to numerous applications.

MICROSWITCH CONSTRUCTION - ELECTRICAL FUNCTIONS

› Single-break changeover SPDT Microswitch (e.g. *V3* 83161)



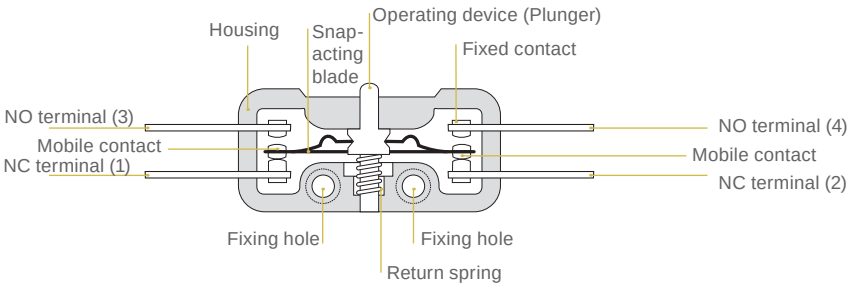
Changeover SPDT (Form C)



Normally Closed SPST-NC (Form B)

Normally Open SPST-NO (Form A)

› Double-break changeover SPDT Microswitch (e.g. 83132)



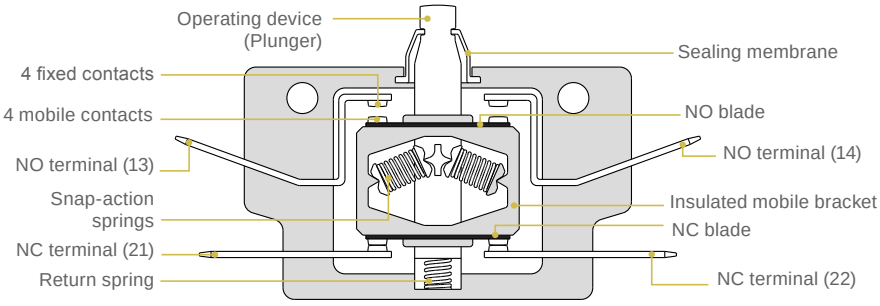
NO and NC circuits must be used at same polarity.

Changeover SPDT (Form Za)

Normally closed SPST-NC (Form Y)

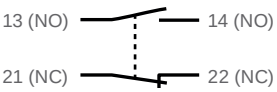
Normally open SPST-NO (Form X)

› Double-break changeover SPDT Microswitch with separated circuits (e.g. *PBX* 8324)



NO and NC circuits are electrically separated, and can be used at opposite polarities.

Changeover SPDT (Form Zb)



› Positive (or direct) opening operation according to IEC 60947-5-1 Annex K (depending on models)

An additional internal mechanism, made of non-resilient parts, forces the opening of NC contacts in case of accidental welding (overload, short-circuit, …) or snap-action mechanism failure.

Models fitted with this function are particularly suitable for safety related applications according to ISO 13849-1 or EN 60204-1.

To ensure proper functioning of positive opening operation, the operating device must be depressed up to the positive opening position.

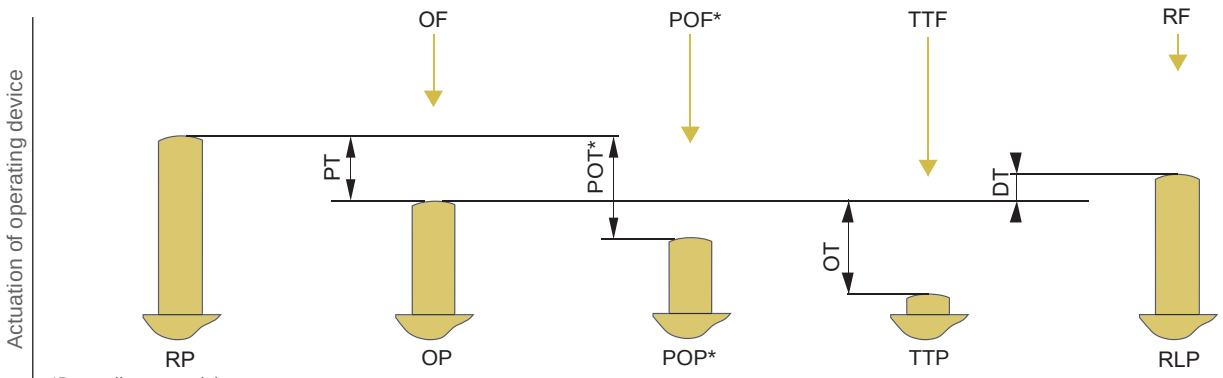
› Maintained action / Bistable reset variants

Double-break microswitches (Form Za, X, Y and Zb) are particularly suitable for achieving this kind of “mechanical memory” function. Return spring is removed, and operating device has special shape for push/pull actuation.

Typical applications are level regulation, manual reset and position contacts for bistable electromagnets.

MECHANICAL CHARACTERISTICS

› Terminology: Forces - Positions - Travels



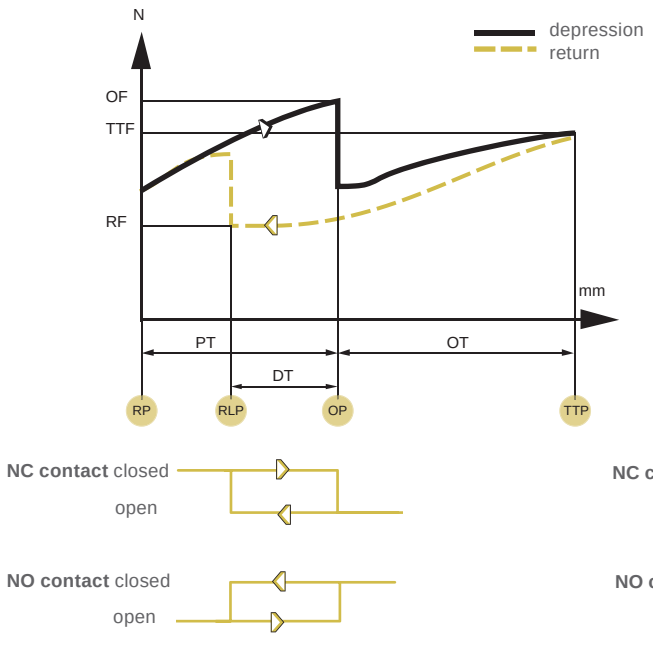
*Depending on models

Forces	**OF Operating force** Force required to move the operating device from the rest position RP to the operating position OP	**POF Positive opening force*** Force to be applied to the operating device to achieve the positive opening operation	**TTF Total travel force** Force required to reach total travel position TTP (only specified when higher than operating force OF) **AOF Allowable overtravel force** Maximum force which can be applied to the operating device without incurring deterioration	**RF Release force** The level to which the applied force must be reduced to allow the snap-action mechanism to return to its release position RLP
Positions	**RP Rest position** Position of the operating device when no external mechanical force is applied	**OP Operating position** Position of the operating device at which the snap-action mechanism trips.	**POP Positive opening position*** Position of the operating device where the positive opening of the NC contacts is guaranteed	**TTP Total travel position** Position of the operating device when the applied force has moved it to the effective end of the available travel	**RLP Release position** Position of the operating device at which the snap-action mechanism trips back to its original position
Travels		**PT Pretravel** Distance between the rest position RP and the operating position OP	**POT Positive opening travel*** Distance between the rest position RP and the positive opening position POP	**OT Overtravel** Distance between the operating position OP and the total travel position TTP	**DT Differential travel** Distance between the operating position OP and the release position RLP

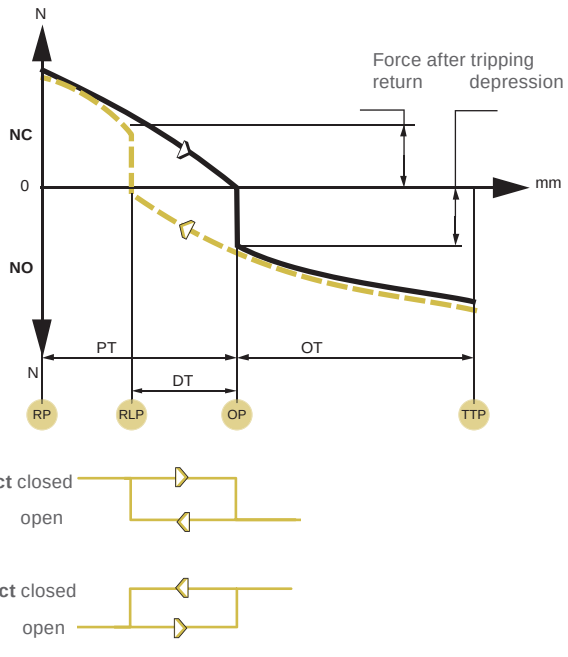
The reference point for the figures given for travels and forces is a point F located on the top of the plunger in the case of a plain microswitch, or, generally, 3 mm in from the end of a flat lever. The reference point for the positions is one of the fixing holes, unless otherwise indicated.

› Force - Travel diagrams

On operating device



On contacts

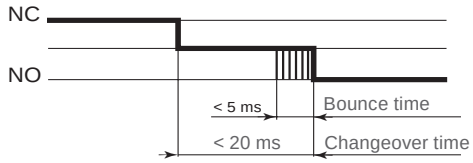


MECHANICAL CHARACTERISTICS

› 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 time less than 5 ms).

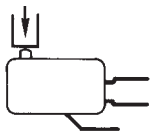


› Actuating speed - Rate of operation

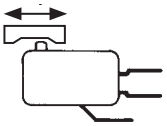
Our microswitches are suitable for actuating speeds varying over a very wide range: typically from 1 mm/min to 0,5 m/s.

The maximum rate of operation with a low electrical load may be as high as 10 cycles / second.

› Direct actuation on plunger

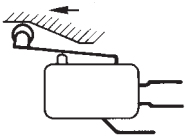


The plunger should preferably be actuated along its axis (front actuation). However, the majority of our microswitches can accept lateral approach provided the angle of actuation is not more than 45°.

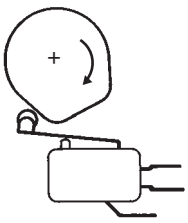


The actuating device shall not limit the plunger travel to the operating position (OP). It must always depress the plunger through at least 0.5 times the defined overtravel (OT), or up to the positive opening position (POP) if applicable. Steps must also be taken to ensure that it does not exceed the total travel position (TTP) nor the allowable overtravel force (AOF).

› Operation by auxiliary actuator (lever)

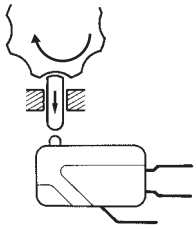


When the roller lever is laterally approached, force should preferably be applied in the direction shown.



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

› Mechanical durability



This is an indicative value of the number of possible operating cycles without an 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.

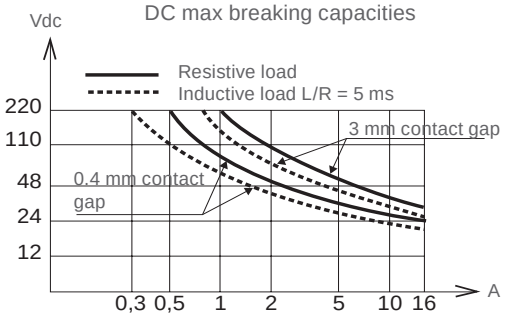
ELECTRICAL CHARACTERISTICS

› Max rating / Making & Breaking capacities

This is the max current the microswitch is capable of making and breaking for at least 6000 cycles.

On DC current, the breaking capacity is extremely dependent on the voltage, the contact gap and the nature of the load being switched. There is a risk of prolonged or permanent arcing if the following limits are exceeded:

DC max breaking capacities



DC breaking capacity can be significantly increased by using different means, if necessary in combination:

- Arc reduction device (see «Electrical recommendations»)
- Double-break microswitch
- Microswitch with magnetic blow-out
- Use of several microswitches connected in series and operated simultaneously

For making and breaking capacities according to utilization categories AC12, AC13, AC14, AC15 and DC12, DC13,DC14 defined by IEC/EN 60947-5-1: refer to our datasheets.

For special applications, please consult us.

› Nominal rating

This is the current the microswitch is capable of making and breaking, for a given number of cycles (typically 100 000 cycles). Nominal rating generally corresponds to the highest ampere rating shown on the operating curve.

› Thermal rating

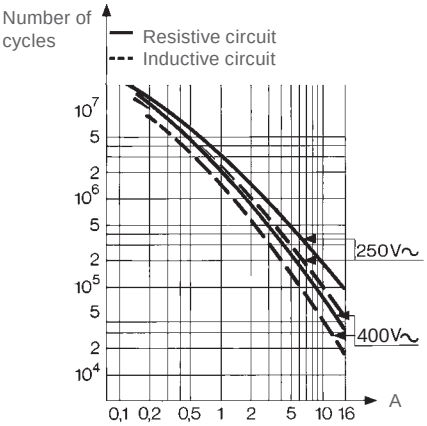
This is the amount of current the microswitch can withstand when not being operated; for a terminal temperature rise of not more than 60°C.

› Electrical durability

Operating curves indicate the electrical life of the microswitches, under standard conditions (20°C, 1 cycle/2 seconds), by showing the number of switching cycles that can be performed with varied types of loads.

Note: for sealed products and/or for DC ratings, the rate of operation is reduced to 1 cycle/6 seconds.

Example:

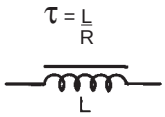


› Influence of load type

Resistive load

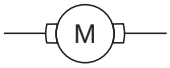
This is the reference load that is used for determining the nominal rating. Switching a resistive load, making and breaking, does not create specific problem.

Inductive load



Electromagnets or motors are typical examples. They are characterized by a cos φ <1 in AC or by a time constant L / R> 0ms in DC.

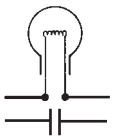
Breaking these loads creates powerful arcing that accelerates erosion of contacts.



Making these loads often generates inrush current up to 6 times the rated current, which increases the risk of contact welding.

In addition, in DC, the phenomenon of contact material relocation is increased.
Ratings and / or life are reduced and special contacts may be needed: please contact us.
Also refer to «Electrical recommendations».

Capacitive load and lamps



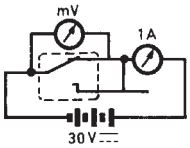
Making these loads generates inrush current up to 15 times the rated current, which greatly increase the risk of contact welding.

In addition, in DC, the phenomenon of contact material relocation is strongly accentuated.

Breaking these loads is equivalent to that of a resistive load and does not cause any particular problems.

Ratings and / or life are reduced and special contacts may be needed: please contact us.

› Contact resistance

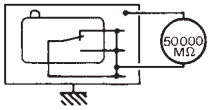


This is the electrical resistance measured at the terminals of the switch when the contacts are closed. It consists of the (variable) resistance of the contact point and the (fixed) resistance of the current carrying parts.

It is generally less than 20 mΩ, when the plunger is in rest position or total travel position.

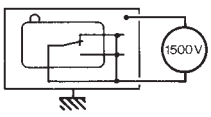
Near the operating or released positions, the contact force decreases and the resistance may increase substantially.

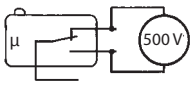
› Insulation resistance



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

› Dielectric withstand voltage





The dielectric withstand voltage of our microswitches is generally higher than values specified by IEC/EN 61058-1 for 250V rated voltage:

- 1500 volts between live parts and ground (basic insulation)
- 1500 volts between open contacts for contact gap >1.5mm (full disconnection)
- 500 volts between open contacts for contact gap <1.5mm (micro-disconnection “μ”)

CONTACT MATERIALS

› Choice of contact material

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

- Current and voltage levels
- Type of load
- Potential inrush current
- Number of cycles
- Rate of operation
- Environmental conditions

› Contacts for general use

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

› Contacts for low-energy circuits

For applications at V <20V and/or I <100mA, especially if P<0.3 VA, we recommend to use contacts with gold (or gold alloy) coating, especially if the switching frequency is low (e.g. <1 cycle / week), or in the presence of sulfide atmosphere or other corrosive environments.

The lower limits are not specifically defined, but a proper functioning can usually be assumed down to 4V 1mA. Below this level, please consult us or refer to «Electrical recommendations».

› Contacts for special applications

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

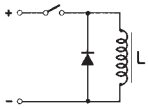
- $AgSnO_2$ or AgCdO contacts for very high inrush current
- Gold plated AgNi contacts, possibly with a crossbar arrangement, to cover a very wide operating range allowing a single part number to be used on different applications (dual-current models).

ELECTRICAL RECOMMENDATIONS

› Inductive circuits

To increase the life of contacts and the DC breaking capacity, the arcing on contact opening can be reduced by using the following protective circuits:

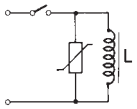
For DC



Protection by fast diode

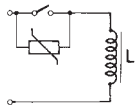
V_R diode > V supply
I_F diode ~ I inductive load

For DC or AC

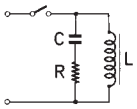


Protection by varistor

V varistor slightly higher than V supply max

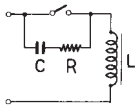


Energy to be dissipated = ½ L I^2



Protection by RC circuit

R and C values to be adjusted depending on circuit characteristics



› Very low-energy circuits

Switching very low energy circuits (I<1mA, V<4V) is highly sensitive to environmental conditions like corrosive atmospheres and pollutions.

In order to improve the contact reliability, the electrical circuit should allow the passage of at least a few mA through the contacts, and at least when the contacts are closing.

Also, the higher the voltage across open contacts, the better the reliability when the contacts are closed.

ENVIRONMENTAL CONDITIONS

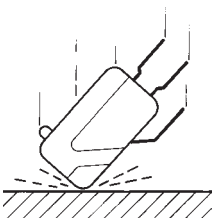
› Operating temperature

The temperature range covered by our line of microswitches extends from -60°C to +250°C.

Operating limits are defined for each type of microswitch. Within these limits, most of the mechanical and electrical characteristics are preserved. However, for cases of intensive use (e.g. numerous thermal cycles with high electrical load) performance may be reduced. For more information please contact us.

› Resistance to shock and vibration

Resistance to shock and vibration depends on the mass of the moving parts and on the forces holding the contacts together. The criterion of satisfactory performance is the absence of micro-opening of contacts.

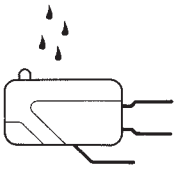


Microswitches without auxiliary actuator usually exceed the following levels when plunger is in rest position or total travel position:

– Vibration (sinusoidal): 10gn, 10 to 500Hz
– Shock: 50gn 11ms half-sine pulse

Further information on request.

› Degree of protection



Degrees of protection provided by enclosures against access to hazardous parts, against ingress of solid foreign objects and against harmful ingress of water are defined in IEC 60529 by an IP code followed by two digits.

1st characteristic numeral		
Protection of equipment against ingress of solid foreign objects		Protection of persons against access to hazardous parts
0	(not protected)	(not protected)
4	diameter ≥ 1 mm	1 mm Ø wire
5	dust-protected	1 mm Ø wire
6	dust-tight	1 mm Ø wire

2nd characteristic numeral	
Protection of equipment against ingress of water with harmful effects	
0	(not protected)
4	splashing
5	jetting
6	powerful jetting
7	temporary immersion
8	continuous immersion
9	high pressure and temperature water jet

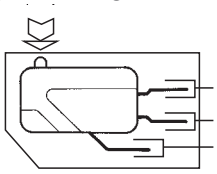
Under this classification, our microswitches mainly come within the following categories:

– IP40 (with insulated connections): when no indication
– IP65, IP66, IP67, IP69: sealed microswitches, as indicated

INSTALLATION RECOMMENDATIONS

› Mounting - Insulation

Our microswitches are built in accordance with the rules of protection against electric shock defined by IEC/EN 60947-5-1 or IEC/EN 61058-1.



Unless otherwise indicated, they are intended for Class I devices and their envelopes provide basic insulation.

Microswitches for Class I equipment are also suitable for Class II equipment,with appropriate installation conditions in the equipment.

Class II microswitches can be used directly in Class II equipment (and also Class 0, I, and III) without additional protection.

The integrator shall take appropriate measures to ensure protection against electric shock (clearances and creepage distances) after installation and connection in the application.

For example:

– An insulating pad may be required between the microswitch and a conductive mounting surface, or between two microswitches mounted side by side (optional accessory)
– Actuation of the operating device may require the use of an intermediate part providing supplementary insulation
– Connections must be protected against direct contact

Please contact us for any additional information related to the considered microswitch.

› Fixing – Tightening torque

Unless otherwise indicated, the tightening torque of the fixing screws must conform to the following values:

Ø of fixing screw	mm	2	2.5	3	3.5	4
Tightening torque in N.m	max.	0.25	0.35	0.6	1	1.5
	min.	0.15	0.25	0.4	0.6	1

› Processing

Silicone containing substances must be excluded from the close environment of the microswitches because of their negative effect on the contact resistance.

For the same reason, cyanoacrylate adhesives must be avoided or carefully selected and tested prior to production run.

Also, grease and oil shall be avoided from the close environment of the microswitches or shall be evaluated for chemical compatibility with plastics.
Moreover, grease and oil shall never penetrate inside the microswitches.

Ultrasonic welding process in the close environment of the microswitches may affect the contacts and the mechanism. Therefore, suitable tests and analysis shall be conducted prior to production run.

Tin soldering must be carried out under an extractor hood in order to avoid the penetration of solder vapors inside the microswitches, that may have negative effect on the electric functioning.

QUALITY

Crouzet Switches 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:
– Mobilization and dynamic behavior 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 Switches acts as expert advisor.
– Quality is pro-active in actions for progress
– Quality ensures the systematic exploitation of feedback experience, methods and quality tools.

Our plants are certified to:
– **ISO 9001:** quality management systems
– **ISO/TS 16949:** particular requirements of quality management systems for automotive production
– **ISO/IEC 80079-34:** application of quality systems for explosive atmospheres equipment manufacture
– **OHSAS 18001:** occupational health & safety management systems.

Certificates can be obtained from **www.crouzet-switches.com**

STANDARDS, TESTING AND APPROVALS

Our microswitches are designed and tested according to international standards like:
– EN/IEC 60947-5-1 for general industrial applications
– EN/IEC 61058-1 for household and similar appliances
– EN/IEC 60079-1 for explosives atmospheres applications.

The Crouzet Switches laboratory is compliant with ISO/IEC 17025 and is certified to:
– SMT (Supervised Manufacturer's Testing) by LCIE, for electrical tests in accordance with EN/IEC 61058-1
– CTDP (Client Test Data Program) by UL, for electrical tests in accordance with UL1054/UL61058-1.

Proof of compliance with these standards is demonstrated by:
– The manufacturer's declaration of conformity (drafted in accordance with ISO/IEC 17050), or
– Approvals granted by accredited bodies, like LCIE (for ENEC, NF, ATEX, IECEx approvals), UL (for cURus, cULus approvals), CQC (for CCC approvals)….

Approval certificates and declarations of conformity can be obtained from **www.crouzet-switches.com**

Concerning machinery applications; EN/IEC 62061 and EN/ISO 13849-1 standards for safety of machinery require the component manufacturers to provide data allowing the equipment manufacturers to calculate the Mean Time To Failure (MTTF) and to determine the Safety Integrity Level (SIL) or the Performance Level (PL) of the safety related parts of their control systems.

Reliability data for switches according to EN/ISO13849-1 can be obtained from **www.crouzet-switches.com**

Note: with appropriate wiring and monitoring system (like Crouzet Control safety relays), safety related parts of control systems containing switches, notably switches with positive opening operation, can reach PL e / Category 4 according to EN/ISO 13849-1, and SIL 3 according to EN/IEC 62061.

RULES AND REGULATIONS

› EU directives

Our microswitches conform to:
– Low Voltage directive 2014/35/EU
– ROHS directive 2011/65/EU
– ATEX directive 2014/34/EU
when applicable.

In addition, they can be used within the framework of Machinery directive 2006/42/EC.

Note about Electromagnetic Compatibility (EMC) directive 2014/30/EU:
– Microswitches, as electromechanical components and as stated in EN/IEC 60947-1, are not sensitive to electromagnetic disturbances and their emissions, generated only when switching, are considered as part of the normal electromagnetic environment of low-voltage installations. Therefore, all of our switches are compliant with the EMC directive.

› Environmental protection

Protection of the environment is an integral part of the manufacturing process of our microswitches, from design to packaging.
– **ISO 14001:** all of our plants are certified.
Certificates can be obtained from **www.crouzet-switches.com**
– **REACH:** Crouzet Switches takes into account any change of the Reach regulation 1907/2006. None of our switches contain substances from the authorisation list. For performance and safety purposes, some switches have contacts containing cadmium oxide which is currently in candidate list.
– **WEEE:** in order to comply with WEEE 2012/19/EU directive, Crouzet Switches adheres to an accredited eco-organism. Switches will come into the scope of WEEE from 2018.

SUB-SUBMINIATURE MICROSWITCHES - CYLINDRIC BODY

83228 / 83229

- **High precision snap-action mechanism with wiping contacts**
- **Very compact cylindrical body**
- **Flush-mounting model for minimum footprint (83228)**
- **Threaded barrel model for precise setting (83229)**
- **Long mechanical life**
- **Use from 1 mA 4 V⎓ to 5 A 250 V∿**
- **Operating temperature -55 °C up to +140 °C**

Main specifications

		Flush-mounting 83228	Threaded barrel fixing 83229
Function	**Connections**		
I (changeover)	W2 solder	**83228001**	**83229001**
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
Maximum total travel force (N)		2.5	2.5
Max. Allowable overtravel force (N)		10	10
Maximum rest position (mm)		2.4	7
Operating position (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)		0.35	0.35
Weight (g)		0.7	1.7

Additional specifications

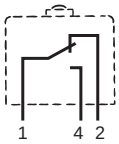
- Cover: PBT GF (UL 94-V0 / GWFI 960 °C)
- Base: PA46 GF (UL 94-V0 / GWFI 960 °C / GWIT 775 °C)
- Moving blade: gold-plated beryllium copper
- Button: PA66 (optional : ceramic)
- Contacts: gold-plated silver
- Terminals: silver-plated brass
- Threaded barrel: nickel-plated brass
- Degree of protection: IP40 (mechanism)
- Min actuating speed: 0.01 mm/s
- Recommended min actuating speed

Product adaptations

- **Ceramic plunger for high stability of operating position throughout the temperature range**
- **High operating temperature: +140 °C**
- **Reduced differential travel: max 0.12 mm (SP9202)**
- **Large overtravel: 1.5 mm (832295)**
- **Plunger with ball for lateral approach from any direction**
- **M8 x 0.75 threaded barrel**
- **83229 supplied with single nut, assembled or delivered separately**
- **cURus approved versions (83229)**

Principles

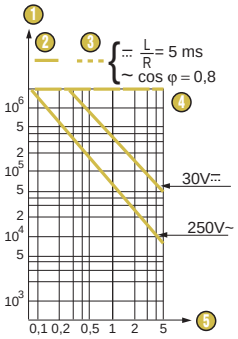
Single break snap-action switch
Changeover - SPDT (form C)



Standard product | Product made to order | ● Contact us

Curves

Operating curve for types 83228 - 83229



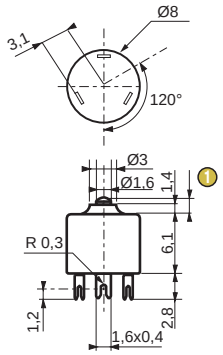
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

* These products are designed to operate equally well on low-current (1 mA 4 V minimum recommended) 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

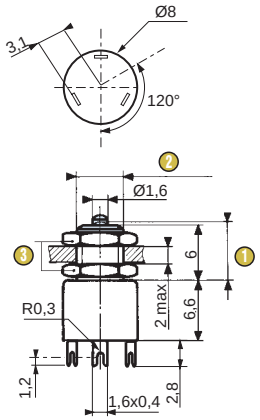
Product

83228



1. Operating position

83229



1. Operating position
2. M5 x 0.5
3. 2 nuts: 7 across flats, max tightening torque 0.8 N.m

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch - Function - Connection - UL approval* - Adaptation*
* if needed
Example: 83229 I W2 UL SP9202

Examples of special adaptations

Plunger with ball (Ø 3 mm) for lateral approach from any direction

Large overtravel model: 1.5 mm (832295) with M8 x 0.75 threaded barrel

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

		Plunger-operated 83 141 0
Function	**Connections**	
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

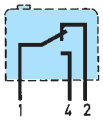
Product adaptations

- Special levers
- Approvals : UL/CSA

To order, see page 12

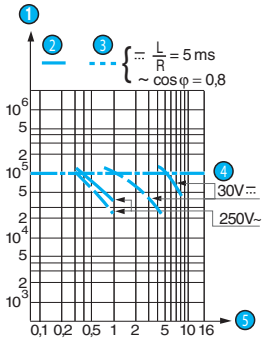
Principles

Single break changeover switch



Curves

Operating curve for type 83 141 0

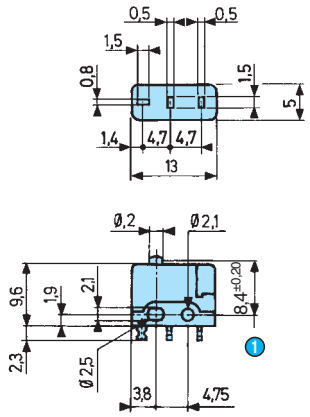


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

➜ Product

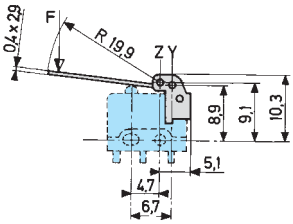
83 141 0



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

SUB-SUBMINIATURE MICROSWITCHES - SEALED

V5S - 8320

- **High precision flexible leaf snap-action mechanism**
- **Operation without balance-point, even at extremely slow actuating speed**
- **Very small size**
- **Extra-long plunger stroke: 2 mm overtravel to absorb dispersions in application**
- **Suitable for lateral approach from any direction with angle up to 45°**
- **Excellent resistance to harsh environments - IP67/IP69 protection**
- **Ratings from 1 mA 4 V⎓ to 4 A 250 V∿**
- **Long mechanical life**
- **Various terminal types and pre-wired models - Choice of flexible actuators**

Main specifications

Function	Connections / Locating pins	Standard 83200	Low current 83201
I (changeover)	X1 / none	**83200003**	**83201003**
I (changeover)	X1 / CAV, CAR, LAV, LAR, 4C, 4L	●	●
I (changeover)	X1L / none	**83200004**	**83201004**
I (changeover)	X1L / CAV, CAR, LAV, LAR, 4C, 4L	●	●
I (changeover)	X2 / CAR	**83200005**	**83201005**
I (changeover)	X2 / LAR	**83200023**	**83201023**
I (changeover)	X2 / none, CAV, LAV, 4C, 4L	●	●
I (changeover)	X3 / CAV	**83200006**	**83201006**
I (changeover)	X3 / LAV	**83200024**	**83201024**
I (changeover)	X3 / none, CAR, LAR, 4C, 4L	●	●
I (changeover)	W2 / LAV	**83200034**	**83201034**
I (changeover)	W2 / 4C	**83200035**	**83201035**
I (changeover)	W2 / none, CAV, CAR, LAR, 4L	●	●
I (changeover)	W2ST / none, CAV, CAR, LAV, LAR, 4C, 4L	●	●
I (changeover)	FB0 / CAR	**83200051**	**83201051**
I (changeover)	FG0 / 4L	**83200063**	**83201063**
I (changeover)	FD0 / none	**83200071**	**83201071**
I (changeover)	FB0, FG0, FD0 / none, CAV, CAR, LAV, LAR, 4C, 4L	●	●
R (Normally closed)	FB0, FG0, FD0 / none, CAV, CAR, LAV, LAR, 4C, 4L	**83202***	**83203***
C (Normally open)	FB0, FG0, FD0 / none, CAV, CAR, LAV, LAR, 4C, 4L	**83204***	**83205***
Electrical characteristics			
Rating nominal / 250 V AC (A)		4	-
Operating range / 4 → 14 V AC/DC (A)		-	0.001 → 0.05
Rating thermal / 250 V AC (A)		5	0.1
Mechanical characteristics			
Max. operating force (N)		1.5	1.5
Min. Release force (N)		0.2	0.15
Max. total travel force (N)		2.5	2.5
Max. Allowable overtravel force (N)		10	10
Max. rest position (mm)		11.1	11.1
Operating position (mm)		$10.5^{\pm 0,2}$	$10.5^{\pm 0,2}$
Max. differential travel (mm)		0.15	0.2
Min. overtravel (mm)		2	2
Ambient operating temperature (°C)		-40 → +90	-40 → +90
Mechanical life (operations)		10^6	10^6
Contact gap (mm)		0.3	0.6
Weight (g) (terminal versions)		0.75	0.75

* Please contact us

Additional characteristics

- Cover: PARA GF
- Base: PA66 GF (UL 94-V0 / GWFI 960 °C)
- Button: POM
- Membrane: silicone rubber
- Moving blade: silver-plated beryllium copper
- Contacts: silver alloy
- Terminals: silver-plated brass
- Wire leads: copper, PVC insulated
- Levers: stainless steel
- Degree of protection: IP67/IP69 (mechanism and wire output)
- Protection against electric shock: button and actuators have reinforced insulation for Ui 250V / Uimp 2,5kV / pollution 2
- Recommended min actuating speed: 0.001 mm/s

Standard product | Product made to order | ● Contact us

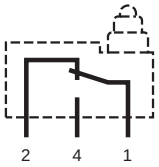
Product adaptations

- Special connections: SMD terminals, special leads, cables, full wiring with custom connector
- Special levers: special shapes and lengths
- Fully customized switching modules with integrated connector
- Integration of resistors for specific electrical diagrams or self-diagnosis function
- Low switching hysteresis variant: 0.06 mm max differential travel
- Dual-current version with gold plated contacts for use from 1mA to 4A
- High operating temperature: +125 °C
- cURus approved versions - ENEC approval

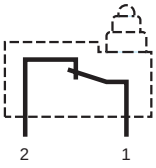
Principles

Single break snap-action switch

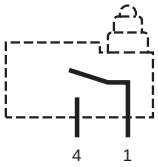
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)



Normally open - SPST-NO (form A)



Curves

Electrical life

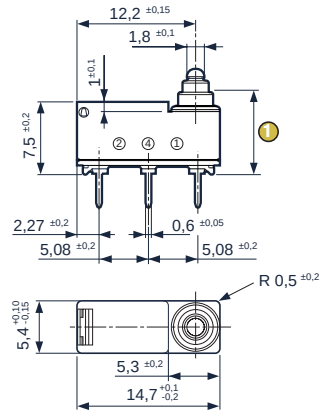
Standard 83200
- 250 V~ 4 A resistive > 6.000 cycles
- 14 V⎓ 2 A resistive 200.000 cycles
- 14 V⎓ 10 W lamps 100.000 cycles
- 14 V⎓ 0.5 A L/R = 4 ms 50.000 cycles

Low-current 83201
- 5 V⎓ 1 mA resistive 1.000.000 cycles

Dimensions (mm)

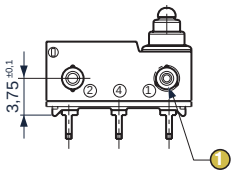
Product

8320
Version without locating pins



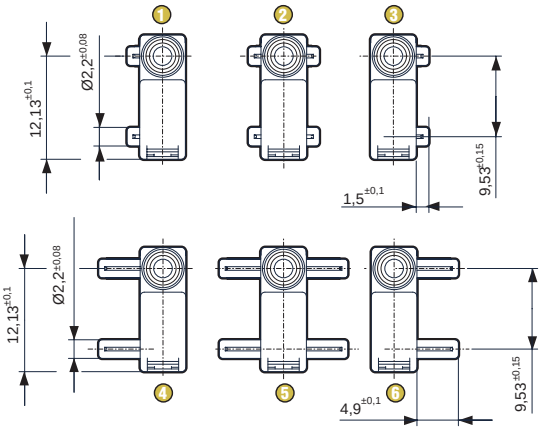
1 Total travel position: max 8.5

8320
Version with locating pins



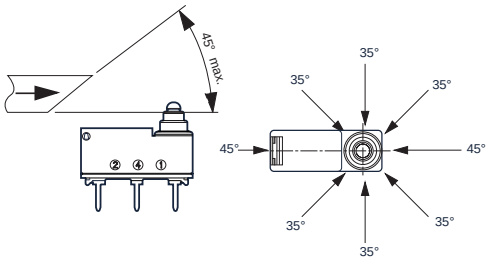
1 Ø 2.6 ±0.1 on ribs

Locating pins



1. 2 short pins at rear (CAR)
2. 4 short pins (4C)
3. 2 short pins at front (CAV)
4. 2 long pins at rear (LAR)
5. 4 long pins (4L)
6. 2 long pins at front (LAV)

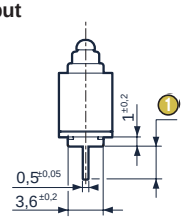
Recommendations for lateral approach



In order to reduce friction and wear, the actuating ramp shall preferably be of PA, POM, PBT or steel, and also be as smooth as possible.
As a general rule, the use of any lubricant substance is not needed nor recommended.
For particular cases, please consult us.

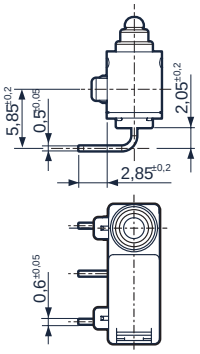
Connections

X1-X1L for printed circuit board, straight output

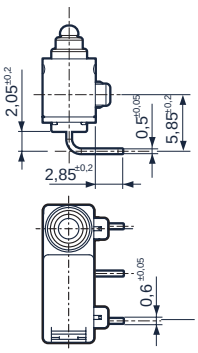


① X1 = 3.5 ± 0.2
X1L = 7 ± 0.2

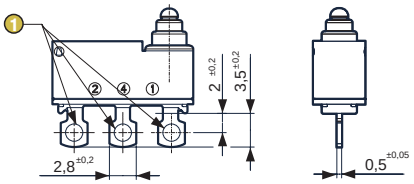
X2 for printed circuit board, rear output



X3 for printed circuit board, front output

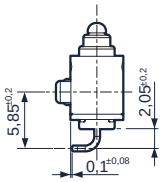


W2 - W2ST solder



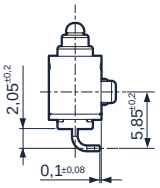
① With holes: W2 Ø 1.8 ± 0.1
Without holes: W2ST

CMS2 for surface mounting, rear output



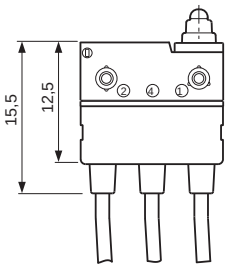
Please contact us

CMS3 for surface mounting, front output

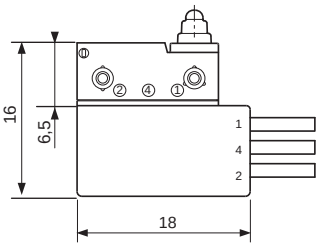


Please contact us

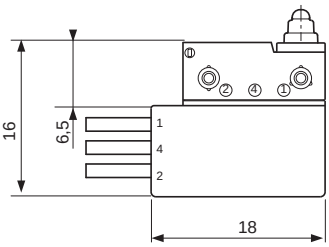
FB0 wire output on bottom



FD0 wire output on right



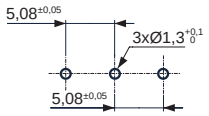
FG0 wire output on left



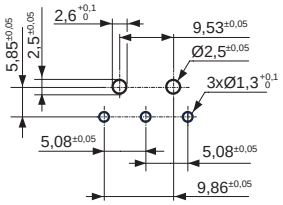
Wire characteristics
1: Black
2: Grey
4: Blue
Cross-section: 0.35 mm^2
Standard length: 500 mm
(other lengths on request)

Drilling

Installation on printed circuit board
X1-X1L-X2-X3

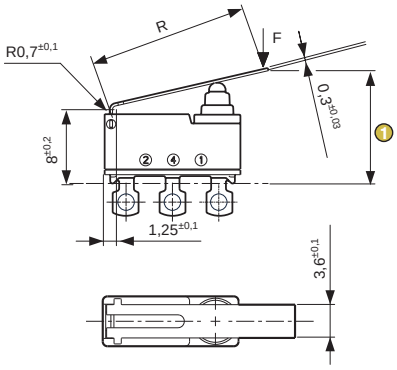


Installation on printed circuit board with locating pins



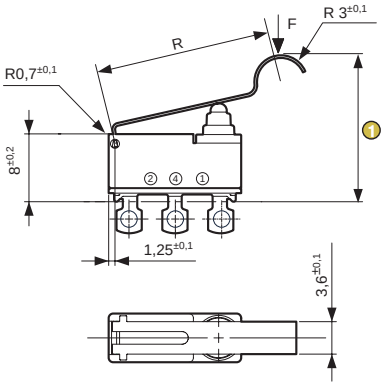
Actuators

200AF flexible flat lever



1 Operating position

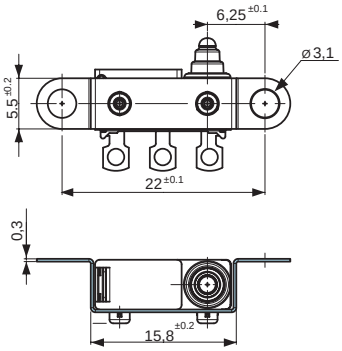
200FF flexible dummy roller lever



Other shapes and dimensions:
consult us

Mounting accessories

Stainless steel mounting flange



Actuators and mounting accessories

Actuators

Flexibles actuators		Flat **200AF** R15	Flat **200AF** R20	Dummy roller **200FF** R17
				
Max. operating force	(N)	1.5	1.3	1.5
Min. release force	(N)	0.1	0.05	0.1
Operating position	(mm)	11.4 $^{\pm 0.4}$	12.2 $^{\pm 0.4}$	14.75 $^{\pm 0.5}$

Actuators are factory mounted

Mounting accessories

79257491

Stainless steel mounting flange

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

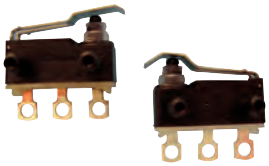
Other cases, precise: Type of microswitch - Connection - Locating pins - Actuator* - Mounting accessories* - Adaptation*
* if needed
Example: 83200 W2 CAV 200AF R15 79257491

Examples of special adaptations

IP67 module with 45° rotary operation, maintained action, integrated connector and quick fastening

IP67 module with integrated connector and quick fastening

Printed circuit board assembly with connector



Special levers

“*V4* size” conversion housing and wire lead or cable output

Customized wiring

SUBMINIATURE MICROSWITCHES - DOUBLE BREAK

83132 / 83133 / 83134

- **Double-break flexible leaf snap-action mechanism**
- **Side, rear or on front face terminals**
- **Momentary or maintained action (option)**
- **Very long life**
- **Ratings from 1 mA 4 V⎓ to 6 A 250 V~**
- **Operating temperature -40 °C up to +150 °C**
- **Wide choice of actuators on 2 symmetric fixing positions**



Main specifications

		Side outputs 83132		Rear outputs 83133		Front face outputs 83134	
		Standard	Dual-current (DORE)	Standard	Dual-current (DORE)	Standard	Dual-current (DORE)
Function	**Connections**						
I (changeover)	W2	**83132030**	**83132053**	**83133035**	**83133073**	-	-
I (changeover)	X1	-	-	**83133045**	**83133052**	**83134001**	**83134003**
R (normally closed)	W2	**83132032**	●	**83133042**	**83133210**	-	-
R (normally closed)	X1	-	-	●	●	-	-
C (normally open)	W2	**83132040**	●	**83133050**	●	-	-
C (normally open)	X1	-	-	●	●	-	-
Electrical characteristics							
Rating nominal / 250 V AC (A)		6	5*	6	5*	6	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. Allowable overtravel force (N)		10		10		10	
Rest position max. (mm)		8.45		8.45		8.10	
Operating position (mm)		$7.7^{\pm 0.2}$		$7.7^{\pm 0.2}$		$7.35^{\pm 0.25}$	
Differential travel (mm)		$0.35^{\pm 0.1}$		$0.35^{\pm 0.1}$		$0.35^{\pm 0.1}$	
Min. overtravel (mm)		0.27		0.27		0.27	
Ambient operating temperature (°C)		-40 → +125		-40 → +125		-40 → +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

- Case, Button: PA66 GF (UL 94-V0 / GWFI 960 °C / GWIT 775 °C)
- Moving blade: beryllium copper
- Contacts: silver, gold-plated silver (dual-current)
- Terminals: copper nickel
- Levers: stainless steel, polyamide roller
- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 400
- Recommanded min actuating speed: 0.01 mm/s

Note: fixing holes are fitted with metal inserts

Product adaptations

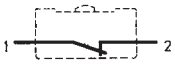
- **Maintained action variants (bistable reset switch), with or without lever**
- **2 or 3-pole assembly with single actuator. Optional mounting on metal plate (8331)**
- **Special levers: special shapes and lengths**
- **Plunger with ball (Ø 5 mm) for lateral approach from any direction**
- **High operating temperature: max +150 °C**
- **Applications in irradiated environment**
- **Higher operating force: max 2.6 N**
- **Larger overtravel: min 0.5 mm (SP4225)**
- **Added overtravel and/or adjustable fixing by threaded barrel (see 83528 and 8354 Series)**
- **cURus and NF approved versions up to 480 V~**

Principles

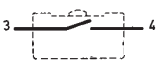
Double break snap-action switch

Changeover - SPDT (form Za)

Normally closed - SPST-NC (form Y)



Normally open - SPST-NO (form X)

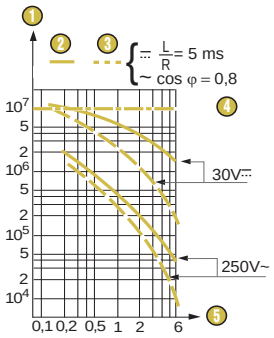


Both circuits must be used at same polarity

Standard product | Product made to order | ● Contact us

Curves

Operating curve for types 83132 - 83133 - 83134



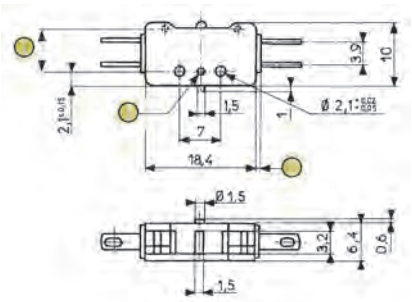
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

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

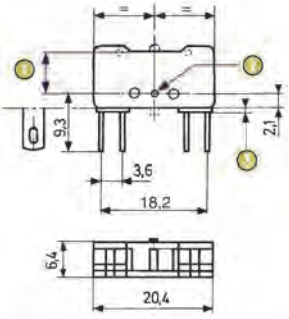
Dimensions

Product

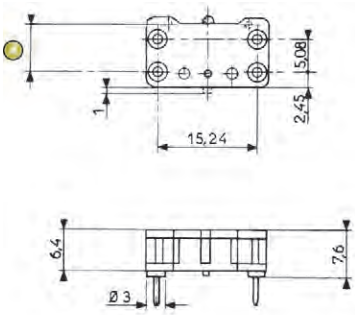
83132



83133



83134

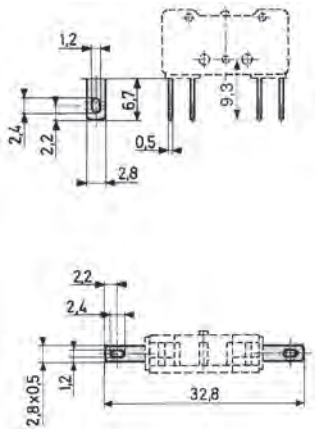


1. Total travel position = 7.35 max.
2. Ø1.5, depth 0.7
3. 2 PTFE plates, thickness 0.8

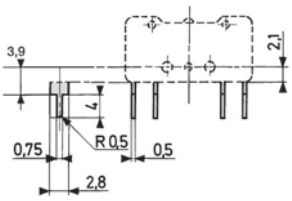
4. Total travel position = 7 max.

Connections

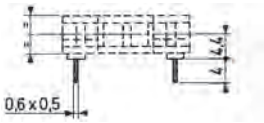
W2 solder or quick-connect 2.8 x 0.5 (83132 - 83133)



X1 for PCB, straight output (83133)

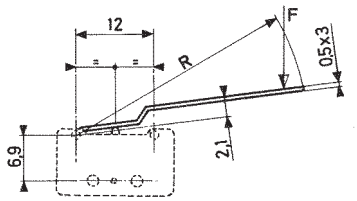


X1 for PCB, straight output (83134)

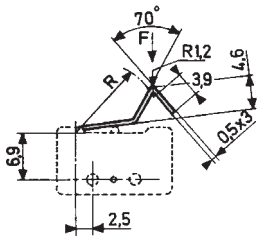


Actuators

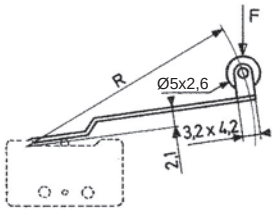
54A flat



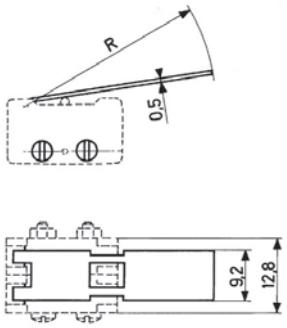
54B folded



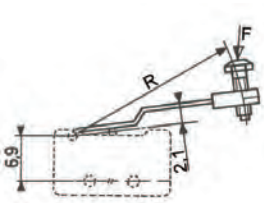
54E roller



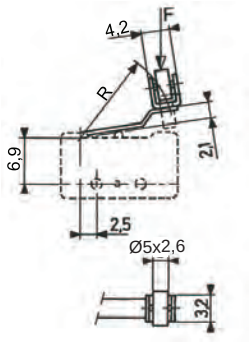
54A2 2-pole



54D adjustable



54EL transverse roller

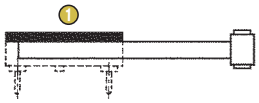


Standard mounting position

For 831320 and 831330

1 Cover

For 831340



1 Cover

Actuators and mounting accessories

Part numbers for standard actuators		70514175	70514194	70514181	70514182	70514183
Actuators		Flat **54A** R14.75	Flat **54A** R35.75	Roller **54E** R7.5	Roller **54E** R14.1	Roller **54E** R34.4
						
		83132	83132	83132	83132	83132
		83133 / 83134	83133 / 83134	83133 / 83134	83133 / 83134	83133 / 83134
Operating position	mm	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	16.1 ±1.4 / 15.8 ±1.4
Operating force max.	N	0.8	0.34	1.6	0.8	0.34
Release force min.	N	0.16	0.06	0.32	0.17	0.07
Pretravel max.	mm	2.15	5.15	1.1	2.05	4.9
Differential travel	mm	1 ±0.3	2.1 ±0.65	0.5 ±0.15	0.95 ±0.3	2 ±0.6
Total travel max.	mm	2.8	6.8	1.45	2.7	6.6

Part numbers for standard actuators		70514559	70514125	70514188	70514178	70514179	70514280
Actuators		Folded **54B** R13.17	2-pole **54A2** R30	Adjustable **54D** R27.1	Transverse Roller **54EL** R7.5	Transverse Roller **54EL** R14.1	Side fixing plate **54Y** stainless steel (16 x 8 x 0,4 mm)
							
		83132	83132	83132	83132	83132	Always supplied separately
		83133 / 83134	83133	83133 / 83134	83133 / 83134	83133 / 83134	
Operating position	mm	12.7 ±0.8 / 12.4 ±0.8	8.8 ±0.8	12.6-17.6 ±1.2 / 12.3-17.3 ±1.2	14.2 ±0.3 / 13.9 ±0.3	15.6 ±0.8 / 15.3 ±0.8	
Operating force max.	N	0.85	0.8	0.43	1.6	0.75	
Release force min.	N	0.18	0.16	0.08	0.32	0.15	
Pretravel max.	mm	2.05	4.3	3.9	1.1	2.25	
Differential travel	mm	0.95 ±0.3	2 ±0.55	1.8 ±0.5	0.5 ±0.15	1 ±0.35	
Total travel max.	mm	2.7	5.75	5.2	1.45	3	

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.

83132/133/134 microswitches with referenced actuators

			Lever	54A		54A2	54B	54D	54E			54EL	
(standard mounting = on left)				R14.75	R35.75	R30	R13.17	R27.1	R7.5	R14.1	R34.4	R7.5	R14.1
			Mounting	70514175	70514194	70514125	70514559	70514188	70514181	70514182	70514183	70514178	70514179
STANDARD	83132	IW2	Standard	83132039	83132045	•	83132087	83132076	83132033	83132003	83132005	•	83132054
	83133	IW2	Standard	83133015	83133038	83133301	83133171	83133118	83133004	83133002	83133003	83133058	83133059
		IX1	Standard	83133174	83133062	83133306	83133212	83133120	•	83133119	•	•	•
	83134	IX1	Standard	83134004	83134016	-	83134002	•	83134015	83134011	83134009	•	•
			On right	83134005	83134012	-	83134007	•	•	83134006	•	•	•
DUAL-CURRENT	83132	IW2	Standard	83132090	•	•	•	•	•	•	•	•	•
	83133	IW2	Standard	•	•	•	•	•	•	83133122	•	•	•
		IX1	Standard	•	83133173	•	•	•	•	•	•	•	•
	83134	IX1	Standard	83134046	•	-	83134028	•	•	83134014	•	•	•
			On right	•	•	-	•	•	•	•	•	•	•

Installation recommendations

See “Basic technical concepts”

For 83133 and 83134: to ensure protection against electric shock after installation in the application, please consult us when conductive parts are located in the immediate proximity of the side walls of the switch housing.

How to order

Use the 8 digit part numbers when they are defined

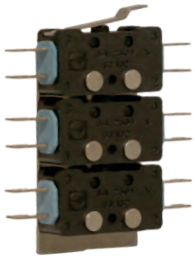
Other cases, precise: Type of microswitch - Function - Connection -Contact* - UL approval* - Actuator* - Fixing position* - Adaptation*
* if needed
Example: 83133 I W2 DORE UL 54E R7.5

Standard product | Product made to order | ● Contact us

Examples of special adaptations

Maintained action variant (bistable reset switch) for level regulation. Has lever with hole for push-pull actuation by a rod with 2 stops

Plunger with ball (Ø 5 mm) for lateral approach from any direction



3 pole assembly (3PDT) on metal plate: 833162

«US format»: housing with 1/2" (12.7 mm) mounting hole pitch (831337)

Flexible pre-armed lever: provides both precise operating position and extra-long overtravel (5 mm)

SUBMINIATURE MICROSWITCHES - STANDARD

V4D - 8327

- **Flexible leaf snap-action mechanism with wiping contacts**
- **Ratings from 0.02 A 24 V⎓ to 12(6) A 250 V∿ and 1/4 HP 125-250 V∿**
- **ENEC and cURus approved up to +150°C**
- **Housing material complying with IEC 60335-1 for unattended appliances: GWFI 850° C / GWIT 775° C**
- **Mushroom-head button variant for lateral approach up to 45°**
- **Choice of connections with symmetric and asymmetric pinning**
- **Choice of pre-assembled actuators**

Main specifications

Function	Connections	Standard 83272	High current 83270	Very high current 83271	Low current 83278
I (changeover)	W2	**83272001**	**83270001**	**83271001**	**83278001**
I (changeover)	W7A5	**83272011**	**83270011**	**83271011**	**83278011**
I (changeover)	X1A	**83272021**	**83270021**	**83271021**	**83278021**
I (changeover)	X1S	**83272031**	**83270031**	**83271031**	**83278031**
I (changeover)	X2A	**83272041**	**83270041**	**83271041**	**83278041**
I (changeover)	X3A	**83272061**	**83270061**	**83271061**	**83278061**
I (changeover)	W7S	**83272081**	**83270081**	**83271081**	**83278081**
R (normally closed)	W2	**83272601**	**83270601**	**83271601**	**83278601**
R (normally closed)	W7A5	**83272611**	**83270611**	**83271611**	**83278611**
C (normally open)	W2	**83272801**	**83270801**	**83271801**	**83278801**
C (normally open)	W7A5	**83272811**	**83270811**	**83271811**	**83278811**
Electrical characteristics					
Rating nominal / 250 V AC (A)		5	10	12	-
Rating thermal / 250 V AC (A)		6	12	15	-
Operating range / 5 → 24 V AC/DC (A)		-	-	-	0.001 → 0.02
Rating ENEC/NF / 250 V AC (A)		5 (1)	10 (2)	12 (6)	0.1 (0.04)
Rating UL / 125/250 V AC (A)		-	10.1 -1/4 HP	-	-
Rating UL / 250 V AC (A)		5 - 1/4 HP	-	-	-
Rating UL / 125 V AC (A)		-	-	-	0.1
Mechanical characteristics					
Maximum operating force (N)		1.5	1.5	1.5	1.5
Min. Release force (N)		0.3	0.3	0.3	0.3
Maximum total travel force (N)		3	3	3	3
Max. Allowable overtravel force (N)		10	10	10	10
Rest position max. (mm)		9.2*	9.2*	9.2*	9.2*
Operating position (mm)		8.4 ±0.3**	8.4 ±0.3**	8.4 ±0.3**	8.4 ±0.3**
Maximum differential travel (mm)		0.15	0.15	0.15	0.15
Min. overtravel (mm)		0.5	0.5	0.5	0.5
Ambient operating temperature (°C)		-25 → +125	-25 → +85	-25 → +85	-25 → +150
Mechanical life for 2/3 OT (operations)		100 000	100 000	100 000	100 000
Contact gap (mm)		0.3	0.3	0.3	0.3
Weight (g)		2	2	2	2

* 10.8 for mushroom-head button
** 9.9 for mushroom-head button

Additional specifications

- Case, Button: PET GF (UL 94-V0 / GWFI 960 °C / GWIT 775 °C)
- Moving blade: beryllium copper
- Contacts: silver alloy or gold plated (83278)
- Terminals: silver-plated brass
- Levers: stainless steel, polyamide roller
- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 250
- Recommended min actuating speed: 0.1 mm/s

Product adaptations

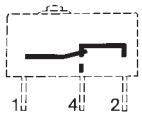
- **Special stainless steel actuators: special shapes and lengths**
- **Special connections: for PCB (symmetric rear or front: X2S, X3S), quick connect 4.8X0.5, angled, ...**
- **Fastening pins**
- **2.35 mm diameter fixing holes (SP9802)**
- **Telescopic plunger with 3 mm overtravel and adjustable fixing by threaded barrel**

Standard product | Product made to order | ● Contact us

Principles

Single break snap-action switch

Changeover - SPDT (form C)

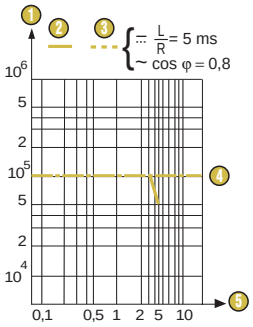


Normally closed - SPST-NC (form B)

Normally open - SPST-NO (form A)

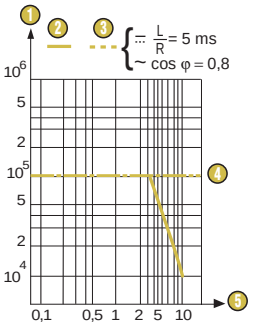
Curves

Operating curve for type 83272



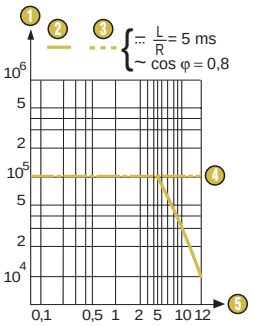
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Operating curve for type 83270



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

Operating curve for type 83271



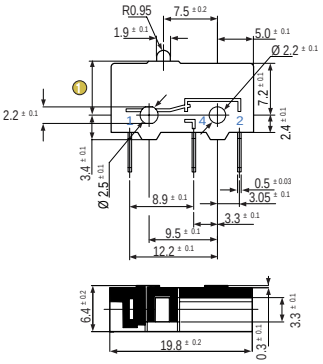
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Electrical life for low-current type 83278: 5 V⎓ 1 mA resistive 20000 cycles

Dimensions

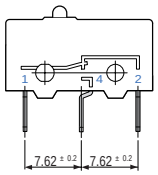
Product

Asymmetrical version

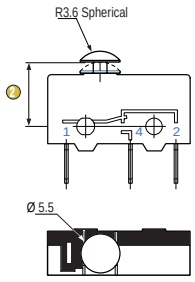


1. Total travel position = 7.6 max.

Symmetrical version (..S connections)

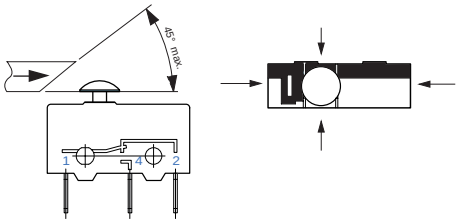


Mushroom-head button



(2) Total travel position = 9.1 max.

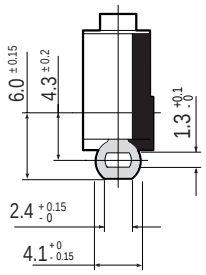
Recommendations for lateral approach



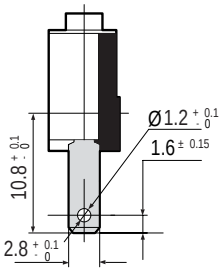
In order to reduce friction and wear, the actuating ramp shall preferably be of POM, PA, or steel, and also be as smooth as possible.
As a general rule, the use of any lubricant substance is not needed nor recommended.
For particular cases, please consult us.

Connections

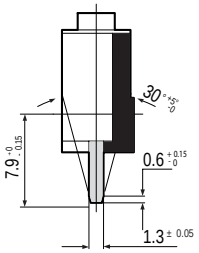
W2 solder



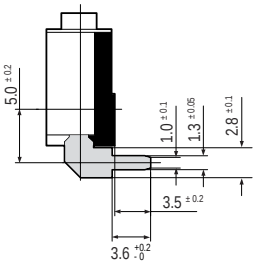
W7A5 quick-connect 2.8 x 0.5
W7S symmetrical quick-connect 2.8 x 0.5



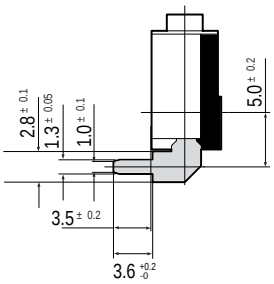
X1A for PCB asymmetrical, straight output
X1S for PCB symmetrical, straight output



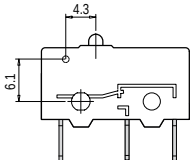
X2A for PCB asymmetrical, rear output



X3A for PCB asymmetrical, front output

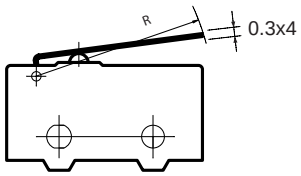


Actuator mounting positions

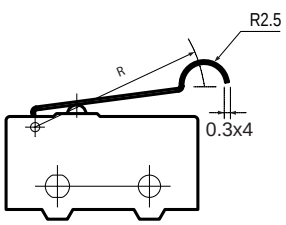


Actuators

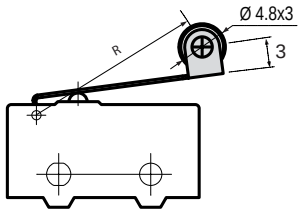
270A flat



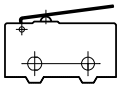
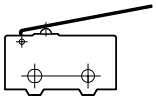
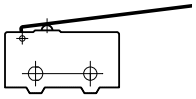
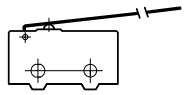
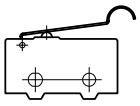
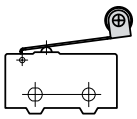
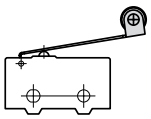
270F dummy roller



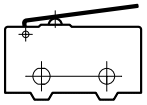
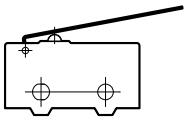
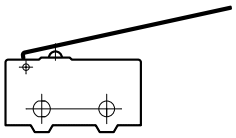
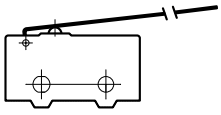
260E roller



Actuator and mounting accessories

Mechanical characteristics		Length of actuator (mm)	Maximum operating force (N)	Minimum release force (N)	Operating position (mm)	Minimum overtravel (mm)	Maximum differential travel (mm)	Maximum total travel (mm)
 Lever 270A R16.8	**83270**	16.8	0.5	0.09	$9.7^{\pm 1.4}$	0.8	0.6	5.5
	83271	16.8	0.5	0.09	$9.7^{\pm 1.4}$	0.8	0.6	5.5
	83272	16.8	0.5	0.09	$9.7^{\pm 1.4}$	0.8	0.6	5.5
	83278	16.8	0.5	0.09	$9.7^{\pm 1.4}$	0.8	0.6	5.5
 Lever 270A R22.5	**83270**	22.5	0.35	0.06	$10.1^{\pm 1.7}$	1.2	1.1	7
	83271	22.5	0.35	0.06	$10.1^{\pm 1.7}$	1.2	1.1	7
	83272	22.5	0.35	0.06	$10.1^{\pm 1.7}$	1.2	1.1	7
	83278	22.5	0.35	0.06	$10.1^{\pm 1.7}$	1.2	1.1	7
 Lever 270A R41	**83270**	41	0.20	0.03	$11.1^{\pm 3}$	3.1	2.1	15
	83271	41	0.20	0.03	$11.1^{\pm 3}$	3.1	2.1	15
	83272	41	0.20	0.03	$11.1^{\pm 3}$	3.1	2.1	15
	83278	41	0.20	0.03	$11.1^{\pm 3}$	3.1	2.1	15
 Lever 270A R60	**83270**	60	0.13	0.02	$11.6^{\pm 5}$	3.6	3.5	23
	83271	60	0.13	0.02	$11.6^{\pm 5}$	3.6	3.5	23
	83272	60	0.13	0.02	$11.6^{\pm 5}$	3.6	3.5	23
	83278	60	0.13	0.02	$11.6^{\pm 5}$	3.6	3.5	23
 Lever 270F R18	**83270**	18	0.45	0.08	$12.6^{\pm 1.5}$	0.8	0.7	6
	83271	18	0.45	0.08	$12.6^{\pm 1.5}$	0.8	0.7	6
	83272	18	0.45	0.08	$12.6^{\pm 1.5}$	0.8	0.7	6
	83278	18	0.45	0.08	$12.6^{\pm 1.5}$	0.8	0.7	6
 Lever 270E R18.5	**83270**	18.5	0.45	0.08	$15.2^{\pm 1.4}$	0.9	0.7	6
	83271	18.5	0.45	0.08	$15.2^{\pm 1.4}$	0.9	0.7	6
	83272	18.5	0.45	0.08	$15.2^{\pm 1.4}$	0.9	0.7	6
	83278	18.5	0.45	0.08	$15.2^{\pm 1.4}$	0.9	0.7	6
 Lever 270E R24.1	**83270**	24.1	0.35	0.06	$15.7^{\pm 1.8}$	1.3	1.2	8
	83271	24.1	0.35	0.06	$15.7^{\pm 1.8}$	1.3	1.2	8
	83272	24.1	0.35	0.06	$15.7^{\pm 1.8}$	1.3	1.2	8
	83278	24.1	0.35	0.06	$15.7^{\pm 1.8}$	1.3	1.2	8

V4D - 8327 microswitches with referenced actuators

Actuators	Type: Function	Type: Connection	83270	83271	83272	83278
 Lever 270A R16.8	I	W2	83270002	83271002	83272002	83278002
	I	W7A5	83270012	83271012	83272012	83278012
	I	X1A	83270022	83271022	83272022	83278022
	I	X1S	83270032	83271032	83272032	83278032
	I	X2A	83270042	83271042	83272042	83278042
	I	X3A	83270062	83271062	83272062	83278062
	I	W7S	83270082	83271082	83272082	83278082
	R	W2	83270602	83271602	83272602	83278602
	R	W7A5	83270612	83271612	83272612	83278612
	C	W2	83270802	83271802	83272802	83278802
	C	W7A5	83270812	83271812	83272812	83278812
 Lever 270A R22.5	I	W2	83270003	83271003	83272003	83278003
	I	W7A5	83270013	83271013	83272013	83278013
	I	X1A	83270023	83271023	83272023	83278023
	I	X1S	83270033	83271033	83272033	83278033
	I	X2A	83270043	83271043	83272043	83278043
	I	X3A	83270063	83271063	83272063	83278063
	I	W7S	83270083	83271083	83272083	83278083
	R	W2	83270603	83271603	83272603	83278603
	R	W7A5	83270613	83271613	83272613	83278613
	C	W2	83270803	83271803	83272803	83278803
	C	W7A5	83270813	83271813	83272813	83278813
 Lever 270A R41	I	W2	83270004	83271004	83272004	83278004
	I	W7A5	83270014	83271014	83272014	83278014
	I	X1A	83270024	83271024	83272024	83278024
	I	X1S	83270034	83271034	83272034	83278034
	I	X2A	83270044	83271044	83272044	83278044
	I	X3A	83270064	83271064	83272064	83278064
	I	W7S	83270084	83271084	83272084	83278084
	R	W2	83270604	83271604	83272604	83278604
	R	W7A5	83270614	83271614	83272614	83278614
	C	W2	83270804	83271804	83272804	83278804
	C	W7A5	83270814	83271814	83272814	83278814
 Lever 270A R60	I	W2	83270005	83271005	83272005	83278005
	I	W7A5	83270015	83271015	83272015	83278015
	I	X1A	83270025	83271025	83272025	83278025
	I	X1S	83270035	83271035	83272035	83278035
	I	X2A	83270045	83271045	83272045	83278045
	I	X3A	83270065	83271065	83272065	83278065
	I	W7S	83270085	83271085	83272085	83278085
	R	W2	83270605	83271605	83272605	83278605
	R	W7A5	83270615	83271615	83272615	83278615
	C	W2	83270805	83271805	83272805	83278805
	C	W7A5	83270815	83271815	83272815	83278815

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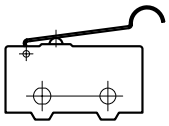
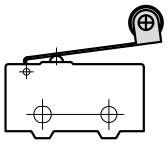
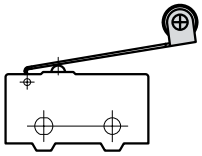
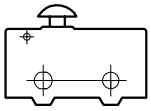
Actuators	Type: Function	Type: Connection	83270	83271	83272	83278
 Lever 270F R18	I	W2	83270006	83271006	83272006	83278006
	I	W7A5	83270016	83271016	83272016	83278016
	I	X1A	83270026	83271026	83272026	83278026
	I	X1S	83270036	83271036	83272036	83278036
	I	X2A	83270046	83271046	83272046	83278046
	I	X3A	83270066	83271066	83272066	83278066
	I	W7S	83270086	83271086	83272086	83278086
	R	W2	83270606	83271606	83272606	83278606
	R	W7A5	83270616	83271616	83272616	83278616
	C	W2	83270806	83271806	83272806	83278806
	C	W7A5	83270816	83271816	83272816	83278816
 Lever 270E R18.5	I	W2	83270007	83271007	83272007	83278007
	I	W7A5	83270017	83271017	83272017	83278017
	I	X1A	83270027	83271027	83272027	83278027
	I	X1S	83270037	83271037	83272037	83278037
	I	X2A	83270047	83271047	83272047	83278047
	I	X3A	83270067	83271067	83272067	83278067
	I	W7S	83270087	83271087	83272087	83278087
	R	W2	83270607	83271607	83272607	83278607
	R	W7A5	83270617	83271617	83272617	83278617
	C	W2	83270807	83271807	83272807	83278807
	C	W7A5	83270817	83271817	83272817	83278817
 Lever 270E R24.1	I	W2	83270008	83271008	83272008	83278008
	I	W7A5	83270018	83271018	83272018	83278018
	I	X1A	83270028	83271028	83272028	83278028
	I	X1S	83270038	83271038	83272038	83278038
	I	X2A	83270048	83271048	83272048	83278048
	I	X3A	83270068	83271068	83272068	83278068
	I	W7S	83270088	83271088	83272088	83278088
	R	W2	83270608	83271608	83272608	83278608
	R	W7A5	83270618	83271618	83272618	83278618
	C	W2	83270808	83271808	83272808	83278808
	C	W7A5	83270818	83271818	83272818	83278818
 Mushroom-head button	I	W2	83270009	83271009	83272009	83278009
	I	W7A5	83270019	83271019	83272019	83278019
	I	X1A	83270029	83271029	83272029	83278029
	I	X1S	83270039	83271039	83272039	83278039
	I	X2A	83270049	83271049	83272049	83278049
	I	X3A	83270069	83271069	83272069	83278069
	I	W7S	83270089	83271089	83272089	83278089
	R	W2	83270609	83271609	83272609	83278609
	R	W7A5	83270619	83271619	83272619	83278619
	C	W2	83270809	83271809	83272809	83278809
	C	W7A5	83270819	83271819	83272819	83278819

Standard product Product made to order ● Contact us

Installation recommendations

See “Basic technical concepts”

How to order

Use 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch + Function + Connection + Actuator*
* if needed
Example: 83272 R W2 270E R24.1

Examples of special adaptations

Folded lever and fastening pins

4.8 x 0.5 quick-connect terminals

Angled W7A5 terminals

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

SUBMINIATURE MICROSWITCHES - PREMIUM

V4 - 83170

- **High precision flexible leaf snap-action mechanism**
- **Operation without balance-point, even at extremely slow actuating speed**
- **Ratings from 1 mA 4 V⎓ up to 12(6) A 250 V~ and 1/4 HP 125-250 V~**
- **ENEC and cURus approved up to +150 °C**
- **Mechanical life up to 30 million cycles**
- **High resistance to shock and vibration**
- **Choice of connections with symmetric and asymmetric pinning**
- **Wide choice of actuators on 2 possible fixing positions (pre-assembled or retrofittable)**

Main specifications

		Standard 831700	Low force 831704	Dual-current 831708	Dual-current Low force 831709
Function	**Connections**				
I (changeover)	W2	**83170002**	**83170402**	**83170802**	**83170902**
I (changeover)	W7A5	**83170005**	**83170405**	**83170805**	**83170905**
I (changeover)	X1	**83170008**	**83170408**	**83170808**	**83170908**
I (changeover)	X1S	**83170009**	**83170409**	**83170809**	**83170909**
I (changeover)	X2	**83170010**	**83170410**	**83170810**	**83170910**
I (changeover)	X2S	**83170011**	**83170411**	**83170811**	**83170911**
I (changeover)	X3	**83170012**	**83170412**	**83170812**	**83170912**
I (changeover)	X3S	**83170013**	**83170413**	**83170813**	**83170913**
R (normally closed)	W2	**83170003**	**83170403**	**83170803**	**83170903**
R (normally closed)	W7A5	**83170006**	**83170406**	**83170806**	**83170906**
C (normally open)	W2	**83170004**	**83170404**	**83170804**	**83170904**
C (normally open)	W7A5	**83170007**	**83170407**	**83170807**	**83170907**
Electrical characteristics					
Rating nominal / 250 V AC (A)		10	5	5**	5**
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. allowable overtravel force (N)		10	10	10	10
Rest position max. (mm)		9.2	9.2	9.2	9.2
Operating position (mm)		$8.4^{\pm 0.3}$	$8.4^{\pm 0.3}$	$8.4^{\pm 0.3}$	$8.4^{\pm 0.3}$
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)		-40 +125	-40 +125	-40 +125	-40 +125
Mechanical life (operations)		10^{7}*	3.10^{7}	10^{7}*	3.10^{7}
Contact gap (mm)		0.4	0.4	0.4	0.4
Weight (g)		1.7	1.7	1.7	1.7

* For 2/3 of the overtravel

Additional specifications

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

Product adaptations

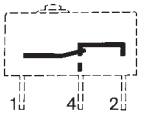
- **Special actuators: stainless steel or plastic, special shapes and lengths**
- **Special connections: angled, screw, double tabs, ...**
- **Special fastening pins**
- **High operating temperature: +150 °C**
- **NF 12(6) A and cURus 12 A approved version (831700 SP9765)**
- **AgSnO2 contacts for very high inrush currents (lamp and capacitor loads)**
- **Increased or reduced differential travel (SP4982: max 0.08 mm)**
- **Specific operating force up to 2.2 N**
- **Housing material according to IEC 60335-1 for unattended appliances: GWFI 850° C / GWIT 775° C**
- **Telescopic plunger with 3 mm overtravel and adjustable fixing by threaded barrel**
- **NC contacts with forced break action to prevent contact welding in case of accidental overcurrents**

Standard product | Product made to order | ● Contact us

Principles

Single break snap-action switch

Changeover - SPDT (form C)

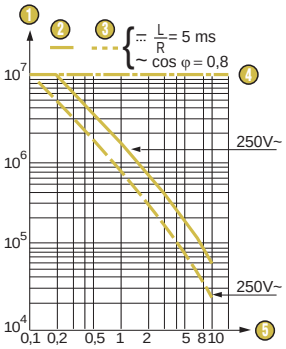


Normally closed - SPST-NC (form B)

Normally open - SPST-NO (form A)

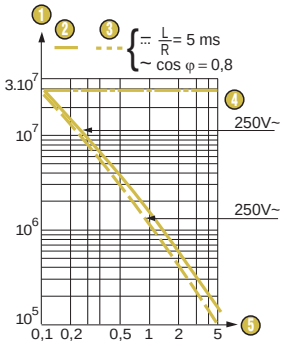
Curves

Operating curve for type 831700



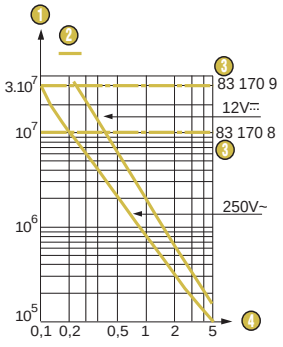
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Operating curve for type 831704



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

Operating curve for types 831708/831709



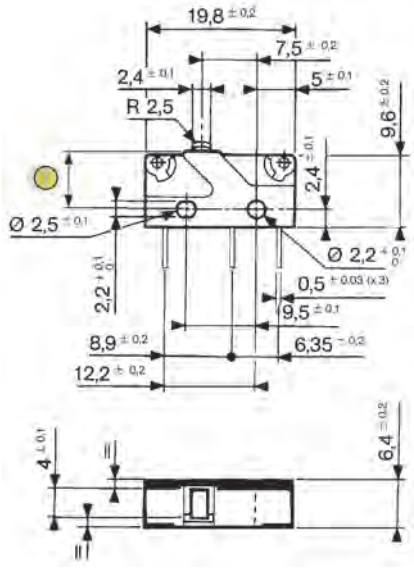
1. Number of cycles
2. Resistive circuit
3. Mechanical life limit
4. Current in Amps

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

Dimensions

Product

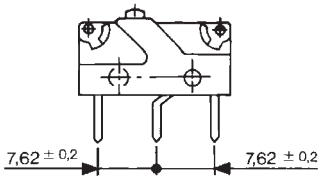
83170
Asymmetrical version



1. Total travel position = max 7.6

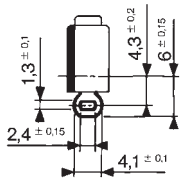
Fixing with M2 screws
Recommended tightening torque: 0.2 N.m

83170
Symmetrical version (X.S connections)

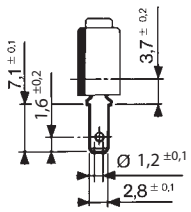


Connections

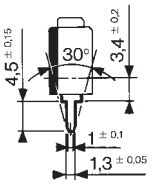
W2 solder



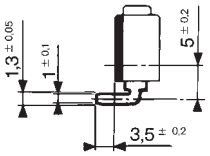
W7A5 quick-connect 2.8 x 0.5



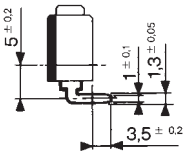
X1 - X1S for PCB, straight output



X2 - X2S for PCB, rear output

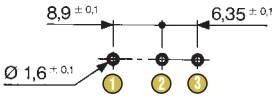


X3 - X3S for PCB, front output



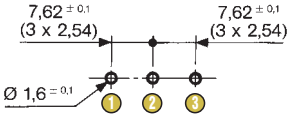
Drilling

Printed circuit board mounting
Asymmetrical X1 - X2 - X3



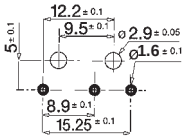
1. 1.C
2. 4.NO
3. 2.NC

Printed circuit board mounting
Symmetrical X1S - X2S - X3S

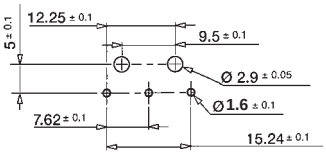


1. 1.C
2. 4.NO
3. 2.NC

Mounting on a printed circuit board
with holding pins
Asymmetrical

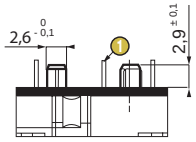


Mounting on a printed circuit board
with holding pins
Symmetrical



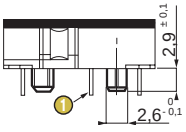
Mounting accessories

Locating pins 79219682



1. X2 - X2S connections

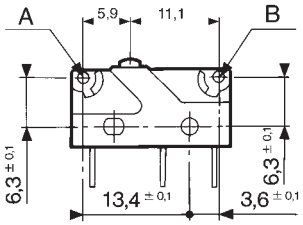
Locating pins 79219682



1. X3 - X3S connections

Other shapes and dimensions:
consult us

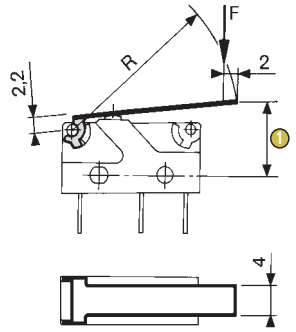
Actuator mounting positions



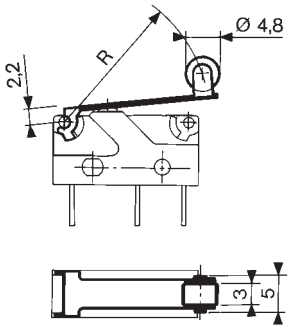
To calculate force : divide the switch force by the coefficient in the table.
To calculate travel : multiply the switch travel by the same coefficient.

Actuators

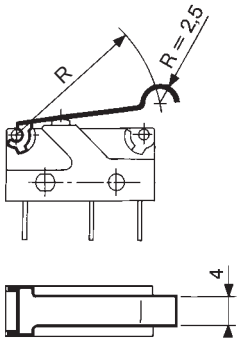
170A flat



170E roller

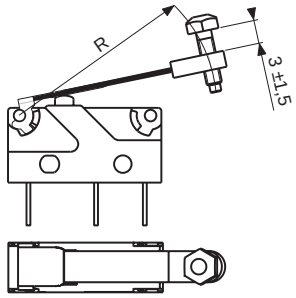


170F dummy roller

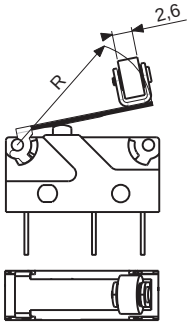


1 Operating position

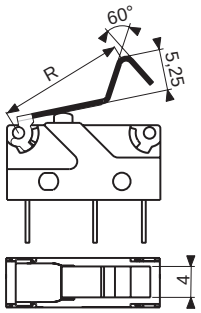
170D adjustable



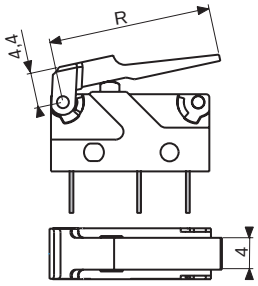
170EL transverse roller



79250004 folded



79257876 plastic



Other shapes and dimensions:
consult us

Actuators and mounting accessories

Part numbers for standard actuators	79253327		79253326		79253328		79218454		79253329	
Actuators	Flat **170A** R18.3		Flat **170A** R24		Flat **170A** R41		Roller **170E** R20		Dummy roller **170F** R19,5	
Fixing positions	A	B	A	B	A	B	A	B	A	B
Coefficient	3	1,5	4	2	7	3,5	3	1,5	3	1,5
Operating position	10 ±1	9,4 ±0,6	10,8 ±1,4	9,8 ±0,8	12,1 ±2,6	10,5 ±1,5	14,7 ±1,3	14,2 ±0,8	12,6 ±1,2	11,9 ±0,7

Part numbers for standard actuators	79218491		79218493		79250004		79257876	
Actuators	Adjustable **170D** R26,5		Transverse roller **170EL** R18		Folded R16,5		Plastic (PARA GF50) R20,5	
Fixing positions	A	B	A	B	A	B	A	B
Coefficient	4	2	3	1,5	2,5	1,2	3	-
Operating position	16,6 ±1,8 *	15,5 ±1,1 *	16,3 ±1,2	15,6 ±0,8	15 ±1	13,9 ±0,6	10,6 ±1,1	-

* Factory setting. Adjustment range +/- 1.5 mm

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

V4 - 83170 microswitches with referenced actuators

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

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch - Function - Connection - Actuator* - Fixing position* - Mounting accessories* - Adaptation*
* if needed
Example: 831708 I X2 170A R24 B 79219682

Examples of special adaptations

Angled W7A5 terminals

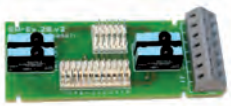
Double lateral 2.8 x 0.5 quick-connect terminals

Top mounted bracket and screw terminals

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

Two-pole assembly with single actuator

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



PCB assembly with terminal block

Special buttons:
see “*V4 Mushroom-head button* - 83170 BC”

Standard product Product made to order ● Contact us

SUBMINIATURE MICROSWITCHES - PREMIUM

V4 Mushroom-head button - 83170 BC

- **High precision flexible leaf snap-action mechanism**
- **Suitable for lateral approach from any direction with angle up to 45°**
- **Operation without balance-point, even at extremely slow actuating speed**
- **Ratings from 1 mA 4 V⎓ up to 12(6) A 250 V~ and 1/4 HP 125-250 V~**
- **ENEC and cURus approved up to +150 °C**
- **Mechanical life 1 million cycles**
- **High resistance to shock and vibration**
- **Choice of connections with symmetric and asymmetric pinning**

Main specifications

Function	Connections	Standard 831700 BC	Low force 831704 BC	Dual-current 831708 BC	Dual-current Low force 831709 BC
I (changeover)	W2	**83170107**	**83170473**	●	**83170965**
I (changeover)	W7A5	●	**83170474**	●	**83170964**
I (changeover)	X1	●	●	**83170840**	**83170971**
I (changeover)	X1S	●	**83170481**	●	●
I (changeover)	X2	●	●	**83170386**	**83170919**
I (changeover)	X2S	●	**83170438**	●	●
I (changeover)	X3	●	●	●	●
I (changeover)	X3S	●	**83170486**	●	●
R (normally closed)	W2	●	**83170495**	●	●
R (normally closed)	W7A5	●	●	●	●
C (normally open)	W2	●	●	●	●
C (normally open)	W7A5	**83170114**	**83170475**	●	●
Electrical characteristics					
Rating nominal / 250 V AC (A)		10	5	5**	5**
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. allowable overtravel force (N)		10	10	10	10
Rest position max. (mm)		10.8	10.8	10.8	10.8
Operating position (mm)		$9.9^{\pm 0.3}$	$9.9^{\pm 0.3}$	$9.9^{\pm 0.3}$	$9.9^{\pm 0.3}$
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)		-40 +125	-40 +125	-40 +125	-40 +125
Mechanical life at 45° (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

* for 2/3 of the overtravel

Additional specifications

- Case: PBT GF (UL 94-V0 / GWFI 960 °C)
- Button: PA66 GF
- Moving blade: beryllium copper
- Contacts: silver alloy, micro-profile
  gold alloy on silver alloy, crossbar (dual-current)
- Terminals: copper nickel (except W7A5: brass)
- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 250
- Protection against electric shock: button has reinforced insulation for Ui 250V / Uimp 2,5kV / pollution 2
- Recommended min actuating speed: 0.001 mm/s
- Approvals: NF - ENEC - cURus

Product adaptations

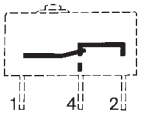
- **Special buttons: cylindrical radius, specific width and height**
- **Special connections: angled, screw, double tabs ...**
- **Special fastening pins**
- **High operating temperature: +150 °C**
- **12 A 250 V~ version**
- **AgSnO2 contacts for very high inrush currents (lamp and capacitor loads)**
- **Increased or reduced differential travel (eg: max. 0.08 mm)**
- **Specific operating force up to 2.2 N**
- **Housing material according to IEC 60335-1 for unattended appliances: GWFI 850° C / GWIT 775° C**

Standard product | Product made to order | ● Contact us

Principles

Single break snap-action switch

Changeover - SPDT (form C)

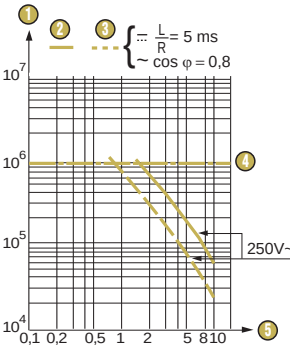


Normally closed - SPST-NC (form B)

Normally open - SPST-NO (form A)

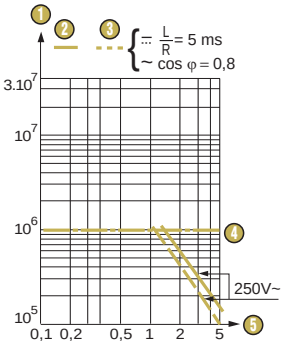
Curves

Operating curve for type 831700 BC



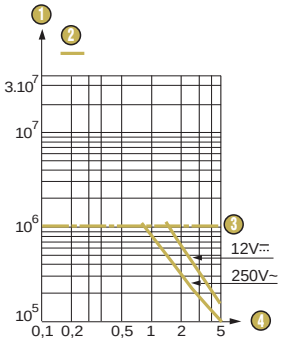
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Operating curve for type 831704 BC



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

Operating curve for types 831708 BC/831709 BC



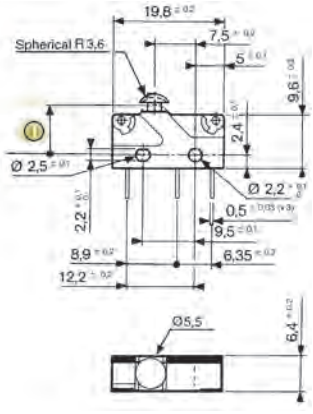
1. Number of cycles
2. Resistive circuit
3. Mechanical life limit
4. Current in Amps

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

Dimensions

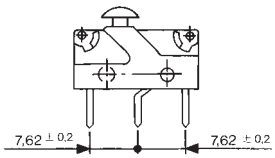
Product

83170 BC
Asymmetrical version

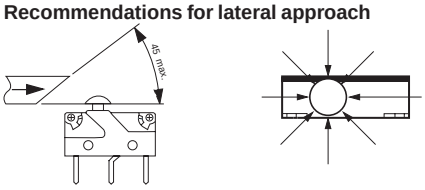


1. Total travel position: max 9.1

83170 BC
Symmetrical version (X.S connections)



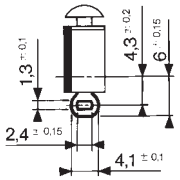
Recommendations for lateral approach



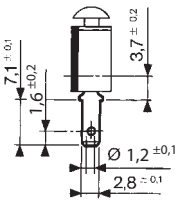
In order to reduce friction and wear, the actuating ramp shall preferably be of POM, PA, PBT or steel, and also be as smooth as possible.
As a general rule, the use of any lubricant substance is not needed nor recommended.
For particular cases, please consult us.

Connections

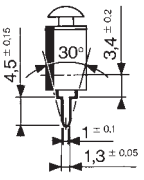
W2 solder



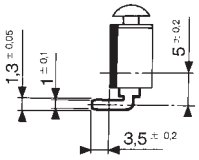
W7A5 quick-connect 2.8 x 0.5



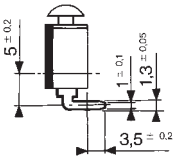
X1 - X1S for PCB, straight output



X2 - X2S for PCB, rear output

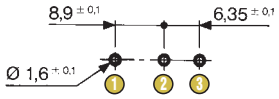


X3 - X3S for PCB, front output



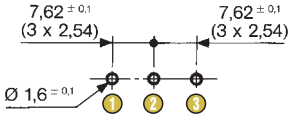
Drilling

Printed circuit board mounting Asymmetrical X1 - X2 - X3



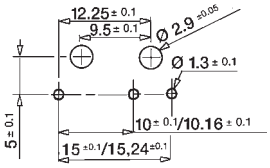
1. 1.C
2. 4.NO
3. 2.NC

Printed circuit board mounting Symmetrical X1S - X2S - X3S

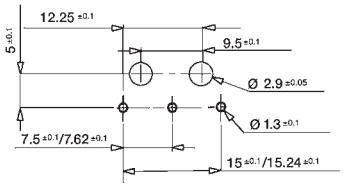


1. 1.C
2. 4.NO
3. 2.NC

Mounting on a printed circuit board with holding pins Asymmetrical

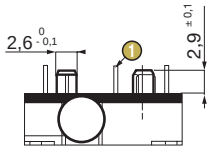


Mounting on a printed circuit board with holding pins Symmetrical



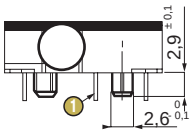
Mounting accessories

Locating pins 79219682



1. X2 - X2S connections

Locating pins 79219682



1. X3 - X3S connections

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch - Function - Connection - Mounting accessories* - Adaptation*
* if needed
Example: 831700 BC I X3 79219682

Examples of special adaptations

Angled W7A5 terminals

Button head with cylindrical radius - 4 mm width

Button head with cylindrical radius - 5.5 mm width

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

PCB assembly with terminal block

SUBMINIATURE MICROSWITCHES - SEALED

V4S - 8318

- **Coil spring snap-action mechanism**
- **Wire lead or cable outputs, various terminal types with symmetric or asymmetric pinning**
- **Excellent resistance to harsh environments - IP67/IP69 protection**
- **Ratings from 1 mA 4 V⎓ to 10 A 250 V∿**
- **Suitable for lateral approach from any direction with angle up to 35°**
- **Operating temperature -40 °C up to +125 °C**
- **Long mechanical life**
- **Wide choice of actuators on 2 possible fixing positions (pre-assembled or retrofittable)**

Main specifications

Function	Connections	Standard 83186	High current 83180	Medium current 83183	Dual-current 83181
I (changeover)	W2S	**83186001**	**83180001**	**83183001**	**83181001**
I (changeover)	W7S	**83186002**	**83180002**	**83183002**	**83181002**
I (changeover)	FD0	**83186003**	**83180003**	**83183003**	**83181003**
I (changeover)	FG0	**83186004**	**83180004**	**83183004**	**83181004**
I (changeover)	FB0	**83186005**	**83180005**	**83183005**	**83181005**
I (changeover)	X1S	**83186006**	●	●	**83181006**
I (changeover)	X1A	●	●	●	**83181007**
I (changeover)	X2S	●	●	●	**83181008**
I (changeover)	X2A	●	●	●	**83181009**
I (changeover)	X3S	●	●	●	**83181010**
I (changeover)	X3A	●	●	●	**83181011**
I (changeover)	CD0	**83186012**	-	**83183012**	**83181012**
I (changeover)	CG0	**83186013**	-	**83183013**	**83181013**
I (changeover)	CB0	**83186014**	-	**83183014**	**83181014**
R (normally closed)	W2S - W7S - FD0 - FG0 - FB0 - CD0** - CG0** - CB0**	**831866***	**831806***	**831836***	**831816***
C (normally open)	W2S - W7S - FD0 - FG0 - FB0 - CD0** - CG0** - CB0**	**831868***	**831808***	**831838***	**831818***
Electrical characteristics					
Rating nominal / 250 V AC (A)		6	10	3	6***
Rating thermal / 250 V AC (A)		7.5	12.5	4	7.5
Mechanical characteristics					
Maximum operating force (N)		2.5	2.5	2.5	2.5
Min. Release force (N)		0.8	0.8	0.8	0.8
Maximum total travel force (N)		4.2	4.2	4.2	4.2
Max. Allowable overtravel force (N)		10	10	10	10
Maximum rest position (mm)		9.3	9.3	9.3	9.3
Operating position (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)		0.6	0.6	0.6	0.6
Ambient operating temperature - terminal versions (°C)		-40 → +125	-40 → +125	-40 → +125	-40 → +125
Ambient operating temperature - wire/cable versions (°C)		-40 → +105	-40 → +105	-40 → +105	-40 → +105
Mechanical life (operations)		2x10^6	2x10^6	2x10^6	2x10^6
Contact gap (mm)		0.4	0.4	0.4	0.4
Weight (terminal versions) g		2	2	2	2

* Contact us ** Except 83180

Additional specifications

- Case: PBT GF (UL 94-V0 / GWFI 960 °C)
- Button: PBT
- Membrane: silicone rubber
- Moving blade: silver-plated beryllium copper
- Contacts: silver cadmium oxyde, micro-profile gold alloy on silver alloy, crossbar (dual-current)
- Terminals: silver-plated brass, tinned brass
- Wire leads, Cable: copper, PVC insulated
- Levers: stainless steel or plastic, polyamide roller
- Degree of protection: IP67/IP69 (mechanism and wire/cable output)
- Proof tracking index: PTI 250
- Protection against electric shock: button and actuators have reinforced insulation for Ui 250V / Uimp 2,5kV / pollution 2
- Recommended min actuating speed: 0.01 mm/s

Product adaptations

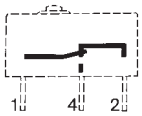
- **Specific fixings: special fastening pins, easy installation / snap-in housings**
- **Special actuators: stainless steel or plastic, flexible levers with reinforced attachment and tear-off protection**
- **Special leads and cables, leads in sleeve, full wiring with custom connector**
- **Integration of resistors for specific electrical diagrams or self-diagnosis function**
- **Reduced differential travel: max 0.10 mm (SF1114)**
- **Long overtravel variant (2 mm), suitable for lateral approach up to 45°, wire or cable output (8320 SF1002)**
- **cURus and NF approved versions (except 83180)**

Standard product | Product made to order | ● Contact us

Principles

Single break snap-action switch

Changeover - SPDT (form C)

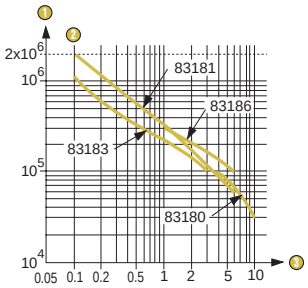


Normally closed - SPST-NC (form B)

Normally open - SPST-NO (form A)

Curves

Operating curve for 250 VAC



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

Max ratings with DC supply

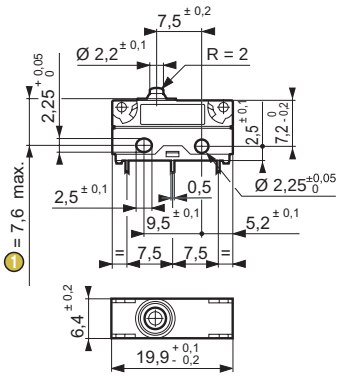
		83180	83181	83183	83186
12 V	Resistive	10 A	6 A	3 A	6 A
	Inductive L/R5 ms	10 A	6 A	3 A	6 A
24 V	Resistive	10 A	6 A	3 A	6 A
	Inductive L/R5 ms	5 A	5 A	3 A	5 A

*** Model 83181 is designed to operate equally well on low current (1 mA 4 V minimum recommended) 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

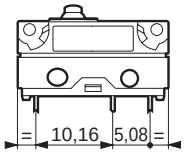
Product

8318
Symmetrical version



1. Total travel position

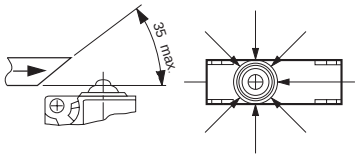
8318
Asymmetrical version (X.A connections)



Fixing with M2 screws

Recommended tightening torques: - screw only: 0.2 N.m
- screw with washer: 0.3 N.m

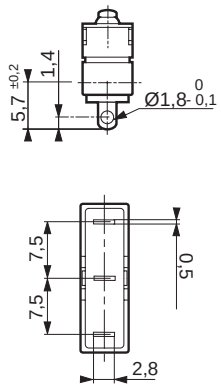
Recommendations for lateral approach



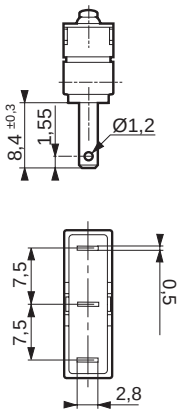
In order to reduce friction and wear, the actuating ramp shall preferably be of POM, PA, or steel, and also be as smooth as possible.
As a general rule, the use of any lubricant substance is not needed nor recommended.
For particular cases, please consult us.

Connections

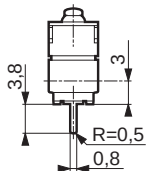
W2S solder



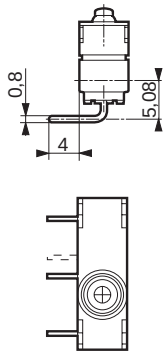
W7S quick-connect 2.8 x 0.5



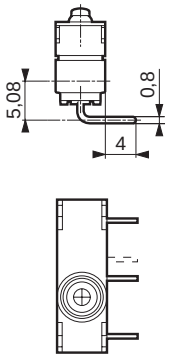
X1A for PCB assymetrical, straight output
X1S for PCB symetrical, straight output



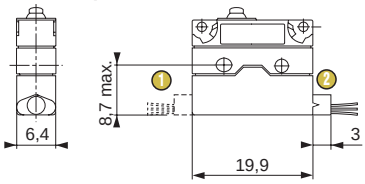
X2A for PCB assymetrical, rear output
X2S for PCB symetrical, rear output



X3A for PCB assymetrical, front output
X3S for PCB symetrical, front output

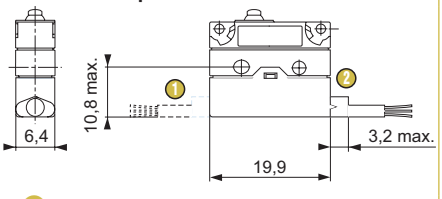


FD0 wire output on right
FG0 wire output on left



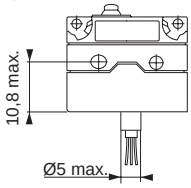
1 FG0
2 FD0

CD0 cable output on right
CG0 cable output on left



1 CG0
2 CD0

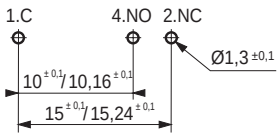
FB0 wire output on bottom
CB0 cable output on bottom



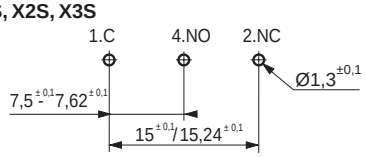
Wire/Cable characteristics: Black = Common, Grey = NC, Blue = NO
Wire cross-section: 83181 / 83183 / 83186 = 0.5 mm² - 83180 = 0.75 mm²
Cable cross-section: 83181 / 83183 / 83186 = 3 x 0.5 mm² or 2 x 0.5mm²
Standard length: 500 mm (other lengths on request)

Drilling

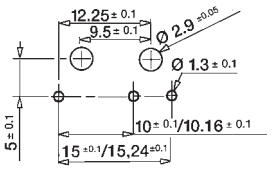
Printed circuit board mounting Asymmetrical
X1A, X2A, X3A



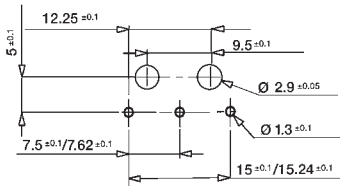
Printed circuit board mounting Symmetrical
X1S, X2S, X3S



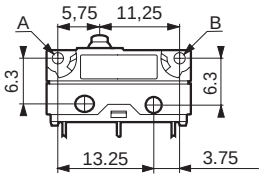
Mounting on a printed circuit board with fixing pins
Asymmetrical



Mounting on a printed circuit board with fixing pins
Symmetrical



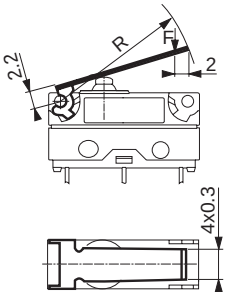
Actuator mounting positions



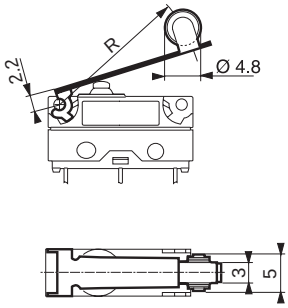
To calculate force: divide the switch force by the coefficient in the table
To calculate travel: multiply the switch travel by the same coefficient

Actuators

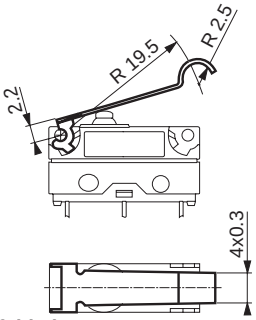
170A flat



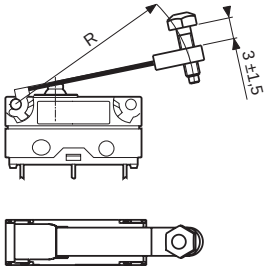
170E roller



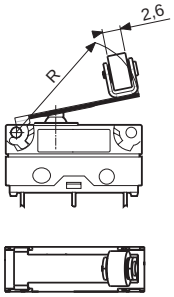
170F dummy roller



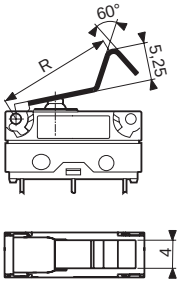
170D adjustable



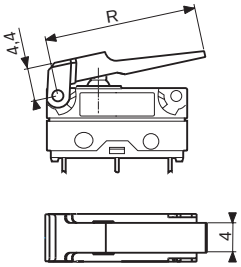
170EL transverse roller



79250004 folded



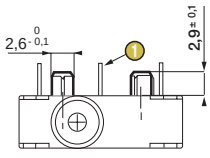
79257876 plastic



Other shapes and dimensions:
consult us

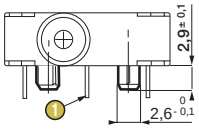
Mounting accessories

Locating pins 79219682



1 X2S-X2A connections

Locating pins 79219682



1 X3S-X3A connections

Other shapes and dimensions:
consult us

Actuators and mounting accessories

Part numbers for standard actuators	79253327		79253326		79253328		79218454		79253329	
Actuators	Flat **170A** R18.3		Flat **170A** R24		Flat **170A** R41		Roller **170E** R20		Dummy roller **170F** R19,5	
										
Fixing positions	A	B	A	B	A	B	A	B	A	B
Coefficient	3	1,5	4	2	7	3,5	3	1,5	3	1,5
Operating position	10 ±1	9,4 ±0,6	10,8 ±1,4	9,8 ±0,8	11,4 ±2,6	9,3 ±1,5	14,7 ±1,3	14,2 ±0,8	12,6 ±1,2	11,9 ±0,7

Part numbers for standard actuators	79218491		79218493		79250004		79257876	
Actuators	Adjustable **170D** R26,5		Transverse roller **170EL** R18		Folded R16,5		Plastic (PARA GF50) R20,5	
								
Fixing positions	A	B	A	B	A	B	A	B
Coefficient	4	2	3	1,5	2,5	1,2	3	-
Operating position	16,6 ±1,8*	15,5 ±1,1*	16,3 ±1,2	15,6 ±0,8	15 ±1	13,9 ±0,6	10,6 ±1,1	-

* Factory setting. Adjustment range +/- 1.5 mm

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

V4S 8318 microswitches with referenced actuators

	Actuator	170A R18.3		170A R24		170E R20		170F R19.5		Folded R16,5	
		79253327		79253326		79218454		79253329		79250004	
		Pos A	Pos B	Pos A	Pos B	Pos A	Pos B	Pos A	Pos B	Pos A	Pos B
83186	I W2S	83186051	83186052	83186053	83186054	83186055	83186056	83186057	83186058	•	•
	I W7S	83186059	83186060	83186061	83186062	83186063	83186064	83186065	83186066	•	•
	I FD0	83186067	83186068	83186069	83186070	83186071	83186072	83186073	83186074	•	•
	I FG0	•	•	•	•	83186075	•	•	•	•	•
	I X1S	•	83186046	•	•	83186080	83186047	•	•	•	•
	I X2S	•	•	•	•	•	•	•	•	•	•
	I X3S	•	•	•	•	•	•	•	•	•	•
83181	I W2S	83181051	83181052	83181053	83181054	83181055	83181056	83181057	83181058	•	•
	I W7S	83181059	83181060	83181061	83181062	83181063	83181064	83181065	83181066	•	•
	I FD0	83181067	83181068	83181069	83181070	83181071	83181072	83181073	83181074	•	83181083
	I FG0	•	•	•	•	•	•	•	•	•	83181082
	I X1S	•	•	•	•	•	•	•	•	•	•
	I X2S	•	•	•	•	•	•	•	•	•	•
	I X3S	•	•	83181080	•	•	•	•	83181106	•	•

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

Other cases, precise:

Type of microswitch - Function - Connection - UL/NF approval* - Actuator* - Fixing position* - Mounting accessories* - Adaptation*
* if needed
Example: 83186 I X2S UL/NF 170E R20 B 79219682

Standard product | Product made to order | • Contact us

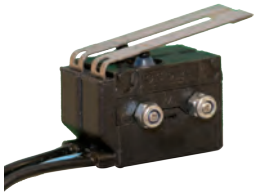
Examples of special adaptations

Easy installation / snap-in housing and special actuator with tear-off protection

Special housing with single fastening hole on upper face, for 4 mm blind rivet or screw

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

Flexible lever fitted on special housing with wire or cable output



Two-pole assembly with linked levers

Custom bracket with integrated metal plungers and complete wiring with sealed connector

2 mm overtravel variant with wire lead output

MINIATURE MICROSWITCHES - PREMIUM

V3 - 83161

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

Main specifications

		Standard 831613		High current 831612		
		Standard	UL	Standard	UL	UL SP4186
Function	**Connections**					
I (changeover)	W2	**83161301**	**83161348**	●	**83161273**	●
I (changeover)	W3	**83161338**	**83161344**	**83161241**	**83161244**	●
I (changeover)	W6A5	**83161304**	**83161343**	●*	●*	-
I (changeover)	W3R5	**83163023**	**83163107**	●*	●*	●*
I (changeover)	W5	**83161303**	**83161349**	●*	●*	-
I (changeover)	W6D8	**83161305**	**83161341**	●*	●*	-
I (changeover)	W7A5	**83161309**	**83161350**	-	-	-
I (Changeover)	2W7A8	**83161310**	●	●*	●*	-
R (Normally closed)	W2	**83161316**	**83163041**	●	**83161274**	●
R (Normally closed)	W3	**83161311**	**83163066**	●	●	●
R (Normally closed)	W6A5	**83161359**	●	●*	●*	-
R (Normally closed)	W3R5 - W5 - W6D8 - W7A5 - 2W7A8	●	●	●*	●*	●*
C (Normally open)	W2	**83161315**	●	●	●	●
C (Normally open)	W3	**83161312**	**83161346**	●	●	●
C (Normally open)	W6A5	**83161325**	●	●*	●*	-
C (Normally open)	W3R5 - W5 - W6D8 - W7A5 - 2W7A8	●	●	●*	●*	●*
Electrical characteristics						
Rating nominal / 250 V AC (A)		16		20		
Rating thermal / 250 V AC (A)		20		22		
Rating ENEC/NF / 250 V AC (A)		16(4)	16(4)	20(8)	20(8)	20(8)
Rating UL / 125/250 V AC (A)		-	16 - 1/2HP	-	15 - 1/2HP	20 - 1/2HP
Mechanical characteristics						
Maximum operating force (N)		0.8		1**		
Min. Release force (N)		0.2		0.2		
Maximum total travel force (N)		2		2.5		
Max. Allowable overtravel force (N)		20		20		
Maximum rest position (mm)		16.2		16.1		
Operating position (mm)		$14.7^{\pm 0.3}$		$14.7^{\pm 0.4}$		
Maximum differential travel (mm)		0.35		0.35		
Min. overtravel (mm)		1.2		1.1		
Ambient operating temperature (°C)		-60 → +125		-60 → +125		
Mechanical life for 2/3 OT (operations)		2×10^7		2.5×10^5		
Contact gap (mm)		0.4		0.4		
Weight (g)		5.6		5.6		

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

Additional specifications

- Case: PA6 GF (UL 94-V2 / GWFI 960 °C) - Standard versions
  PBT GF (UL 94-V0 / GWFI 960 °C) - UL versions
  PET GF (UL 94-V0 / GWFI 960 °C / GWIT 775 °C) - On request
- Button: PA66
- Moving blade: silver-plated beryllium copper
- Contacts: silver alloy, micro-profile (831612: silver cadmium oxyde)
- Terminals: brass (except W2 : copper nickel)
- Levers: stainless steel or polyamide, polyamide roller
- Nuts for 161L: nickel-plated brass
- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 250
- Protection against electric shock: button and actuators have reinforced insulation for Ui 250V / Uimp 2,5kV / pollution 2
- Recommended min actuating speed: 0.001 mm/s
- Approvals: Standard versions: NF - ENEC
  UL versions: NF - ENEC -cURus

Standard product Product made to order ● Contact us

Main specifications (continued)

High force 831611		Low force 831614		Very low force 831615		Ultra low force 83161 5 SP 4136		Wide contact gap 831616			
Standard	UL	Standard	UL	Standard	UL	Standard	UL	Standard	UL	Func.	Conn.
83161102	83161058	83161402	83161431	83161502	●	83161520	●	83161601	●	I	W2
83161118	83161165	83161401	●	83161501	83161513	83161519	83161573	83161602	83161636	I	W3
83161110	83161182	83161403	83161407	83161503	83161508	●	83161577	●*	●*	I	W6A5
●	●	●	●	83161516	83161518	●	83161575	83161619	●	I	W3R5
83161113	83161055	●	83161408	83161509	83161511	●	●	83161603	●	I	W5
83161123	●	●	83161429	83161507	●	●	●	●	●	I	W6D8
83161189	●	83161405	●	●	●	●	●	●*	●*	I	W7A5
83161059	●	●	●	●	●	●	●	●*	●*	I	2W7A8
83161117	●	●	●	83161595	●	●	●	83161609	●	R	W2
83161109	●	●	●	83161528	●	●	●	83161605	●	R	W3
83161070	●	83161424	●	●	●	●	●	●*	●*	R	W6A5
●	●	●	●	●	●	●	●	●*	●*	R	Others
83161104	83161082	●	83161435	●	●	83161589	●	●	●	C	W2
83161103	83161188	83161404	83161412	●	●	●	●	83161606	●	C	W3
83161125	83161111	●	●	83161504	●	●	●	●*	●*	C	W6A5
●	●	●	●	●	●	●	●	●*	●*	C	Others
										Electrical	
16		10		4		4		12		Nom rating (A)	
20		12		5		5		15		Therm rating (A)	
16(4)	16(4)	10(3)	10(3)	4(1)	4(1)	4(1)	4(1)	12(3)	12(3)	ENEC rating (A)	
-	16 - 1/2HP	-	6 - 1/4HP	-	4 - 1/10HP	-	4 - 1/10HP	-	6 - 1/3HP	UL rating (A)	
										Mechanical	
3		0.5		0.25		0.15		5		OF max (N)	
1		0.1		0.05		0.04		0.5		RF min (N)	
4.5		1.5		0.40		0.2		6		TTF max (N)	
20		20		20		20		20		AOF max (N)	
16.1		16.2		16.3		16.3		16.1		RP max (mm)	
$14.7^{\pm 0.4}$		$14.7^{\pm 0.4}$		$14.7^{\pm 0.4}$		$14.7^{\pm 0.3}$		$14.5^{\pm 0.4}$		OP (mm)	
0.35		0.35		0.35		0.35		0.8		DT max (mm)	
1.1		1.1		1.1		1.2		0.9		OT min (mm)	
-60 → +125		-60 → +125		-40 → +125		-40 → +125		-60 → +125		Temp (°C)	
10^7		3×10^7		5×10^7		5×10^7		5×10^4		Mech. life (op)	
0.4		0.4		0.4		0.4		3.2		Gap (mm)	
5.6		5.6		5.6		5.6		5.6		Weight (g)	

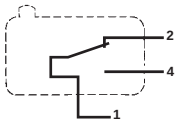
Product adaptations

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

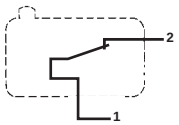
Principles

Single break snap-action switch

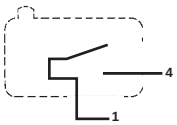
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)

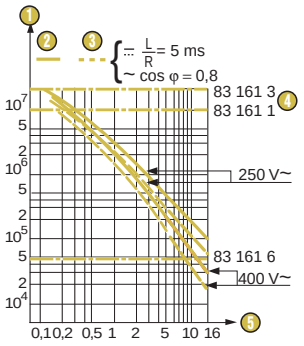


Normally open - SPST-NO (form A)



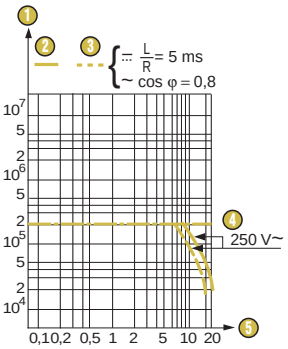
Curves

Operating curve for types 831611* / 831613* / 831616



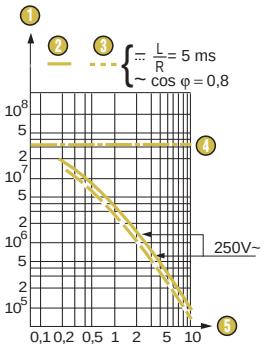
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Operating curve for type 831612



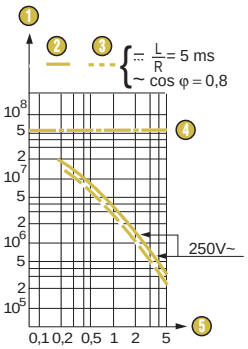
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Operating curve for type 831614



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

Operating curve for types 831615 / 831615 SP 4136



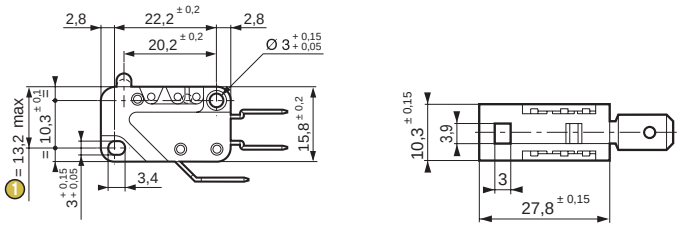
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

* For 831611 UL and 831613 UL: please consult us

Dimensions

Product

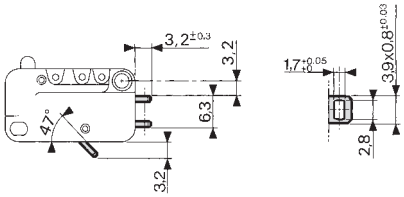
83161



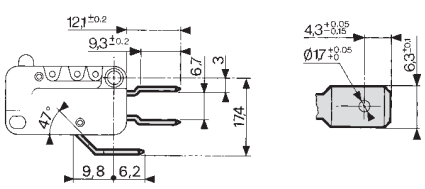
1. Total travel position

Connections

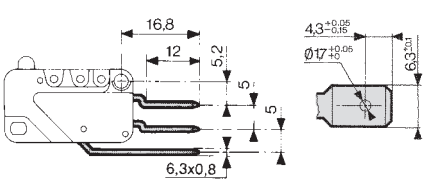
W2 solder



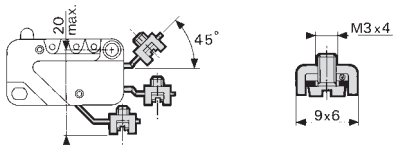
W3 quick-connect 6.3 x 0.8



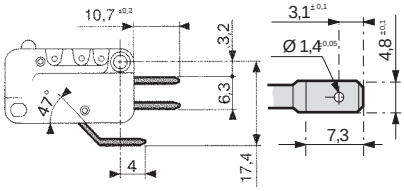
W3R5 quick-connect 6.3 x 0.8 for RAST 5 connector



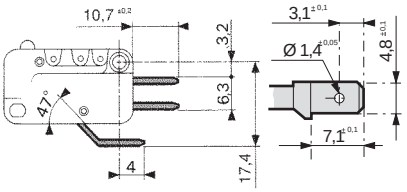
W5 screw with clamp



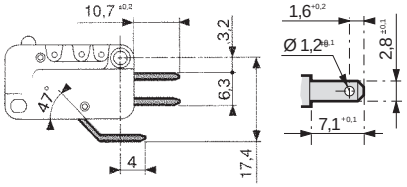
W6A5 quick-connect 4.8 x 0.5



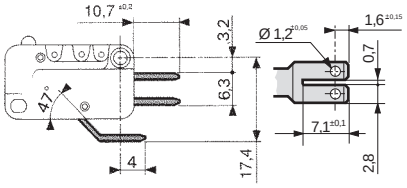
W6D8 quick-connect 4.8 x 0.8



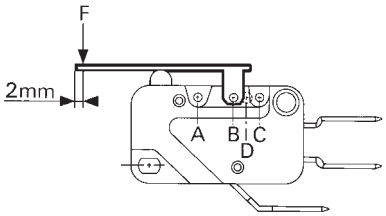
W7A5 quick-connect 2.8 x 0.5

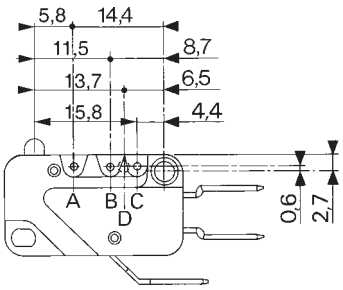


2W7A8 double quick-connect 2.8 x 0.8



Actuator mounting positions

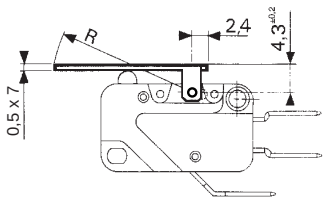




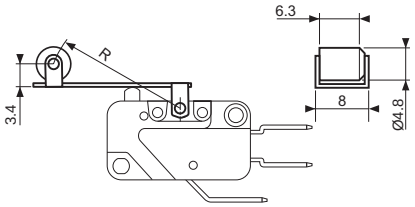
To calculate force
Divide the switch force by the coefficient given in the table.
To calculate travel
Multiply the switch travel by the same coefficient.
Example :
83 161 3 with lever 161 A - R 25.4 position A (coeff. 4)
Operating force: 0.8 : 4 = 0.2 N
Overtravel: 1.2 x 4 = 4.8 mm

Actuators

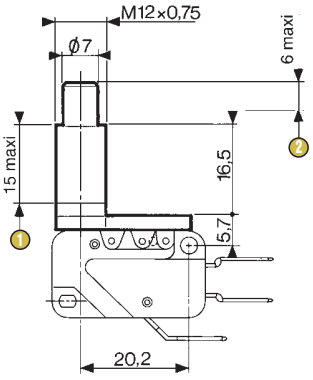
161A flat



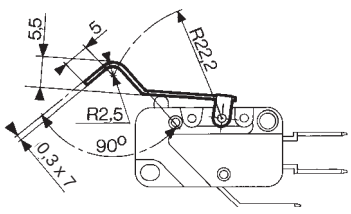
161E roller



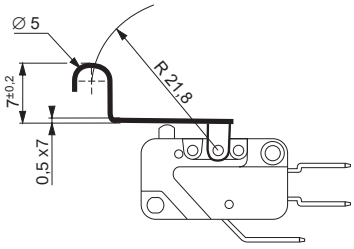
161L telescopic plunger



161F dummy roller



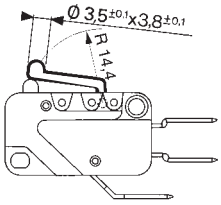
161G dummy roller



1 Thread length
2 Total travel

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

161V plastic

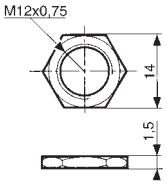


Other shapes and dimensions: consult us

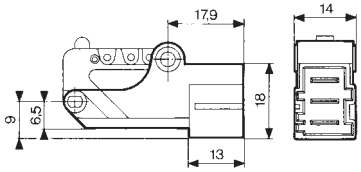
Also available are pinned actuators mounted on position D (factory mounting), same as for 83160 series. (datasheet: SP9640)

Mounting accessories

Nut for 161L



Housing 161J for connections W3 R5



Actuators and mounting accessories

Part numbers for standard actuators	79215740		70507524			79215742		70507529			70507528	
Actuators	Flat **161A** R14,2		Flat **161A** R25,4			Roller **161E** R13,6		Roller **161E** R24,1			Dummy roller **161F** R22,2	
Fixing positions	A	B	A	B	C	A	B	A	B	C	A	B
Coefficient	2	1	4	2	1,5	2	1	4	2	1,5	3	1,8
Operating position (except 831616)	15,2 ±1	15,2 ±0,45	15,2 ±2,5	15,2 ±1	15,2 ±0,8	20,5 ±1,5	20,5 ±0,8	20,5 ±2,9	20,5 ±1,5	20,5 ±1,2	20,4 ±2	20,4 ±0,7
Operating position 831616	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	79218651				79250338	70602118
Actuators	Dummy roller **161G** R21,8		**Telescopic plunger **161L** Manual action		Plastic**161V**	Housing **161J**	Nut for **161L**
Fixing positions	A	B	D		D		
Coefficient	3	1,8	1		1		
Operating position (except 831616)	21,7 ±2	21,7 ±0,7	21,5 ±1		18,35 ±0,45		
Operating postion 831616	21,5 ±2	21,5 ±0,7	21,5 ±1				

Except where otherwise indicated, flat and roller levers are supplied unmounted.
For factory mounting, specify fixing position A, B or C.
** For 831611, 831612, 831613, 831616 mounted in factory (supplied without nut)

V3-83161 microswitches with referenced actuators

Actuators			161A R14.2		161A R25.4			161E R13.6		161E R24.1			161L
			79215740		70507524			79215742		70507529			
			Pos A	Pos B	Pos A	Pos B	Pos C	Pos A	Pos B	Pos A	Pos B	Pos C	Pos D
831611	I W2	STD	83161020	83161021	83161022	83161023	83161024	83161025	83161026	83161027	83161028	83161029	•
		UL	•	•	•	•	•	•	•	•	•	•	•
	I W3	STD	83161032	83161033	83161034	83161035	83161036	83161037	83161038	83161039	83161040	83161041	83161064
		UL	•	•	•	•	•	•	•	•	•	•	83161098
	I W6A5	STD	83161044	83161045	83161046	83161177	83161047	83161048	83161049	83161050	83161051	83161052	•
		UL	•	•	•	•	•	•	•	•	•	•	•
831613	I W2	STD	83163067	83163068	83163069	83163015	83163071	83163072	83163073	83163074	83163016	83163075	83161320
		UL	•	•	•	•	•	•	•	•	•	•	•
	I W3	STD	83163078	83163079	83163080	83163081	83163082	83163083	83161374	83163084	83163007	83163085	83161318
		UL	•	•	•	83161328	•	•	83163221	•	•	•	83163102
	I W6A5	STD	83163088	83163089	83163090	83163091	83163092	83163093	83163094	83161095	83163096	83163097	•
		UL	•	•	•	83161327	•	•	83163222	•	83163220	•	83161352
831615	I W2	STD	83161529	83161530	83161531	83161532	83161533	83161534	83161535	83161536	83161537	83161538	-
		UL	•	•	•	•	•	•	•	•	•	•	-
	I W3	STD	83161541	83161542	83161543	83161544	83161545	83161546	83161547	83161548	83161514	83161549	-
		UL	•	•	•	•	•	•	•	•	•	•	-
	I W6A5	STD	83161552	83161553	83161554	83161526	83161555	83161556	86161557	83161558	83161559	83161560	-
		UL	•	•	•	•	•	•	•	•	•	•	-

Standard product | Product made to order | ● Contact us

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

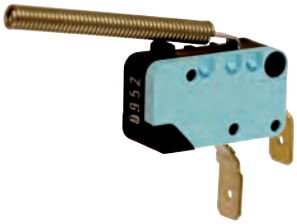
Other cases, precise:

Type of microswitch - Function - Connection - UL approval* - Actuator* - Fixing position* - Mounting accessories* - Adaptation*
* if needed
Example: 831613 C W3R5 UL 161E R13.6 B 79250338 SP9680

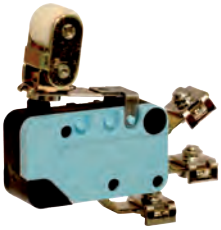
Examples of special adaptations

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

Door switch for industrial vehicle



Spring lever for extra-long overtravel

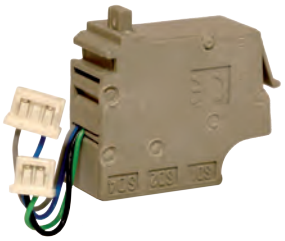


One-way roller lever (active on right, idle-return on left)

Angled W3 terminals

RAST 7mm - W3R7 connections

Fully specific integrable switching module with terminal block for time switch



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

MINIATURE MICROSWITCHES - PREMIUM

V3 Dual-current - 83161

- **High precision flexible leaf snap-action mechanism**
- **Operation without balance-point, even at extremely slow actuating speed**
- **Broad range of operating forces from 0.15 N to 3 N**
- **Use from 1 mA 4 V⎓ to 5 A 250 V∿**
- **Operating temperature from -60 °C up to +150 °C - High resistance to shock and vibration**
- **Mechanical life up to 50 million cycles**
- **ENEC and cURus approved**
- **Wide choice of actuators on 4 possible fixing positions (pre-assembled or retrofittable)**

Main specifications

		Dual-current 831618		Dual-current High force 831618 SP 4174		Dual-current Very low force 831619		Dual-current Ultra low force 831619 SP 4136	
		Standard	UL	Standard	UL	Standard	UL	Standard	UL
Function	**Connections**								
I (Changeover)	W2	**83161801**	**83168021**	**83168015**	**83168008**	**83161928**	●	**83161901**	●
I (Changeover)	W3	**83161806**	**83161873**	**83161832**	**83161894**	**83161906**	●	**83161904**	**83161917**
I (Changeover)	W6A5	**83161812**	**83161813**	●	●	●	●	●	**83161911**
I (Changeover)	W3R5	●	●	●	●	●	●	●	●
I (Changeover)	W5	●	●	●	●	●	●	●	●
I (Changeover)	W6D8	●	●	●	●	●	●	**83161915**	●
I (Changeover)	W7A5	**83161803**	●	●	●	●	●	●	●
I (Changeover)	2W7A8	●	●	●	●	●	●	●	●
R (Normally closed)	W2	**83161807**	●	●	●	●	●	●	●
R (Normally closed)	W3	**83161821**	●	●	●	**83161907**	●	**83161916**	●
R (Normally closed)	W6A5	●	●	●	●	●	●	●	●
R (Normally closed)	W3R5 - W5 - W6D8 W7A5 - 2W7A8	●	●	●	●	●	●	●	●
C (Normally open)	W2	**83161818**	●	●	●	●	●	●	●
C (Normally open)	W3	**83161822**	**83161827**	●	●	●	●	●	●
C (Normally open)	W6A5	**83161826**	**83161819**	●	●	●	**83161908**	●	●
C (Normally open)	W3R5 - W5 - W6D8 W7A5 - 2W7A8	●	●	●	●	●	●	●	●
Electrical characteristics									
Rating nominal / 250 V AC (A)		5*		5*		4*		4*	
Rating thermal / 250 V AC (A)		6		6		5		5	
Rating ENEC/NF / 250 V AC (A)		0.1(0.04)	0.1(0.04)	0.1(0.04)	0.1(0.04)	0.1(0.04)	0.1(0.04)	0.1(0.04)	0.1(0.04)
Rating UL / 125 V AC (A)		-	1	-	1	-	1	-	1
Mechanical characteristics									
Maximum operating force (N)		0.8		3		0.25		0.15	
Min. Release force (N)		0.2		1		0.05		0.04	
Maximum total travel force (N)		2		4.5		0.40		0.2	
Max. permitted overtravel force (N)		20		20		20		20	
Maximum rest position (mm)		16.2		16.1		16.3		16.3	
Operating position (mm)		$14.7^{\pm 0.3}$		$14.7^{\pm 0.4}$		$14.7^{\pm 0.4}$		$14.7^{\pm 0.3}$	
Maximum differential travel (mm)		0.35		0.35		0.35		0.35	
Min. overtravel (mm)		1.2		1.1		1.1		1.2	
Ambient operating temperature (°C)		-60 → +125		-60 → +125		-40 → + 125		-40 → +125	
Mechanical life for 2/3 OT (operations)		2×10^7		10^7		5×10^7		5×10^7	
Contact gap (mm)		0.4		0.4		0.4		0.4	
Weight (g)		5.6		5.6		5.6		5.6	

Additional specifications

- Case: PA6 GF (UL 94-V2 / GWFI 960 °C) - Standard versions
  PBT GF (UL 94-V0 / GWFI 960 °C) - UL versions
  PET GF (UL 94-V0 / GWFI 960 °C / GWIT 775 °C) - On request
- Button: PA66
- Moving blade: silver-plated beryllium copper
- Contacts: gold alloy on silver alloy, crossbar (dual-current)
- Terminals: brass (except W2 : copper nickel)
- Levers: stainless steel or polyamide, polyamide roller
- Nuts for 161L: nickel-plated brass
- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 250
- Protection against electric shock: button and actuators have reinforced insulation for Ui 250V / Uimp 2,5kV / pollution 2
- Recommended min actuating speed: 0.001 mm/s
- Approvals: Standard versions: NF - ENEC
  UL versions: NF - ENEC -cURus

Standard product | Product made to order | ● Contact us

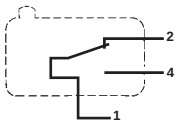
Product adaptations

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

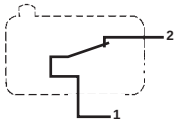
Principles

Single break snap-action switch

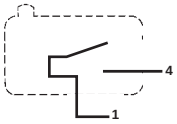
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)

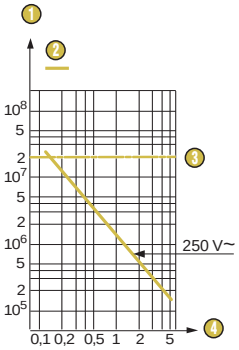


Normally open - SPST-NO (form A)



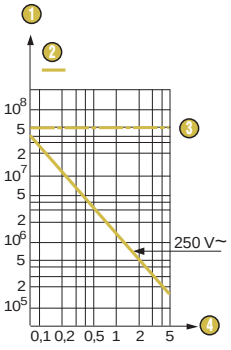
Curves

Operating curve for type 831618 and 831618 SP 4174



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

Operating curve for types 831619 and 831619 SP 4136



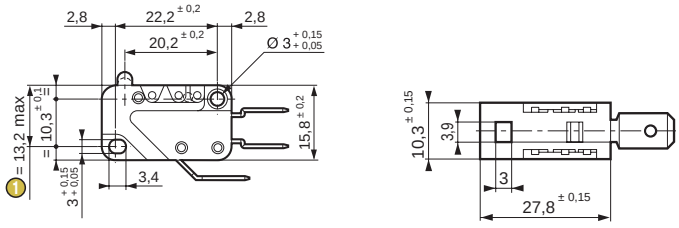
1. Number of cycles
2. Resistive circuit
3. Mechanical life limit
4. Current in Amps

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

Dimensions

Product

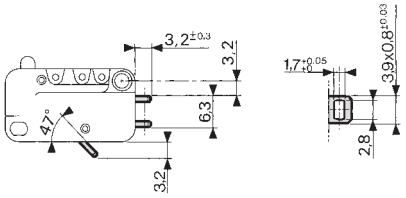
83161



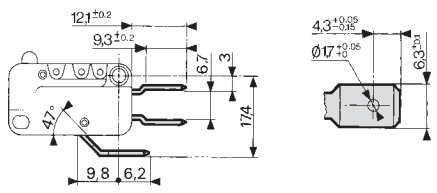
1. Total travel position

Connections

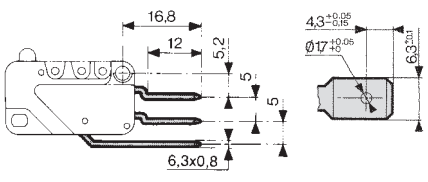
W2 solder



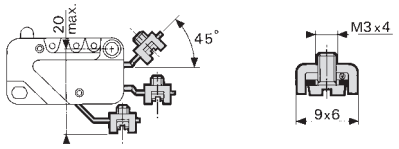
W3 quick-connect 6.3 x 0.8



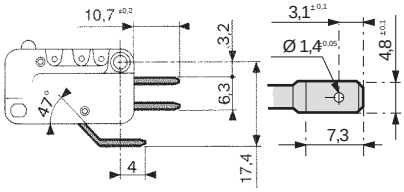
W3R5 quick-connect 6.3x0.8 for RAST 5 connector



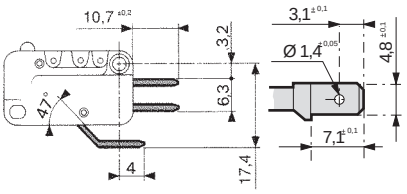
W5 screw



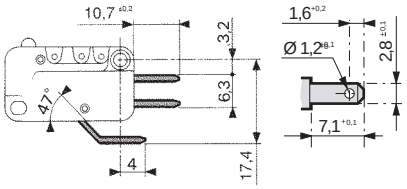
W6A5 quick-connect 4.8 x 0.5



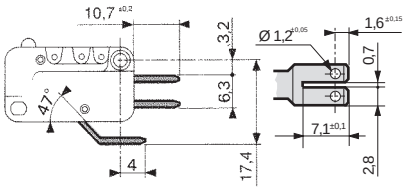
W6D8 quick-connect 4.8 x 0.8



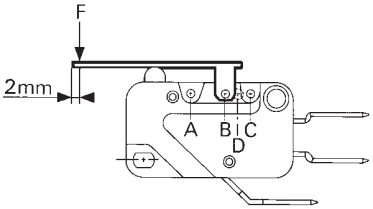
W7A5 quick-connect 2.8 x 0.5

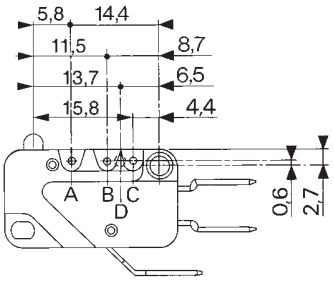


2W7A8 double quick-connect 2.8 x 0.8



Actuator mounting positions

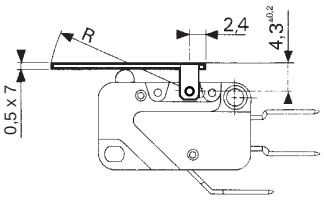




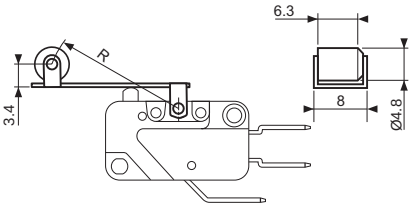
To calculate force
Divide the switch force by the coefficient given in the table.
To calculate travel
Multiply the switch travel by the same coefficient.
Example :
83 161 8 with lever 161 A - R 25.4 position A (coeff. 4)
Operating force: 0.8 : 4 = 0.2 N
Overtravel: 1.2 x 4 = 4.8 mm

Actuators

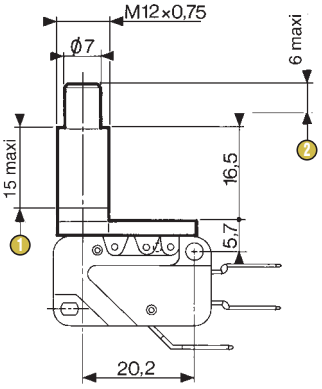
161A flat



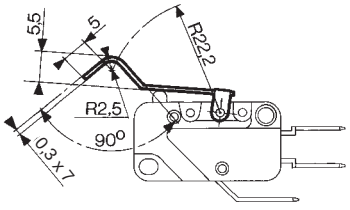
161E roller



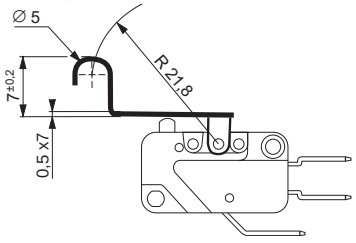
161L telescopic plunger



161F dummy roller



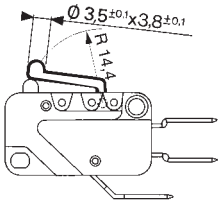
161G dummy roller



1 Thread length
2 Total travel

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

161V plastic

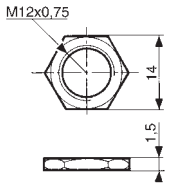


Other shapes and dimensions: consult us

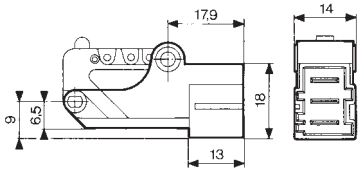
Also available are pinned actuators mounted on position D (factory mounting), same as for 83160 series. (datasheet: SP9640)

Mounting accessories

Nut for 161L



Housing 161J for connections W3 R5



Actuators and mounting accessories

Part numbers for standard actuators	**79215740**		**70507524**			**79215742**		**70507529**			**70507528**	
Actuators	Flat **161A** R14,2		Flat **161A** R25,4			Roller **161E** R13,6		Roller **161E** R24,1			Dummy roller **161F** R22,2	
Fixing positions	A	B	A	B	C	A	B	A	B	C	A	B
Coefficient	2	1	4	2	1,5	2	1	4	2	1,5	3	1,8
Operating position (except 831616)	15,2 ±1	15,2 ±0,45	15,2 ±2,5	15,2 ±1	15,2 ±0,8	20,5 ±1,5	20,5 ±0,8	20,5 ±2,9	20,5 ±1,5	20,5 ±1,2	20,4 ±2	20,4 ±0,7
Operating position 831616	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	**79218651**				**79250338**	**70602118**
Actuators	Dummy roller **161G** R21,8		**Telescopic plunger **161L** Manual action	Plastic**161V**	Housing **161J**	Nut for **161L**
Fixing positions	A	B	D	D		
Coefficient	3	1,8	1	1		
Operating position (except 831616)	21,7 ±2	21,7 ±0,7	21,5 ±1	18,35 ±0,45		
Operating postion 831616	21,5 ±2	21,5 ±0,7	21,5 ±1			

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

** For 831618, 831618 SP 4174 mounted in factory (supplied without nut)

***V3 Dual-current* - 83161 microswitches with referenced actuators**

	Actuators		161A R14.2		161A R25.4			161E R13.6		161E R24.1			161L
			79215740		70507524			79215742		70507529			
			Pos A	Pos B	Pos A	Pos B	Pos C	Pos A	Pos B	Pos A	Pos B	Pos C	Pos D
831618	I W2	STD	83161838	83161839	83161840	83161841	83161842	83161843	83161844	83161845	83161846	83161847	83161833
		UL	•	•	•	•	•	•	•	•	•	•	•
	I W3	STD	83161850	83161851	83161852	83161853	83161854	83161855	83161856	83161857	83161858	83161859	83161820
		UL	•	•	•	•	•	•	•	•	•	•	•
	I W6A5	STD	83161862	83161863	83161864	83161865	83161866	83161867	83161824	83161868	83161869	83161870	•
		UL	•	•	•	•	•	•	•	•	•	•	•

Installation recommendations

See “Basic technical concepts”

How to order

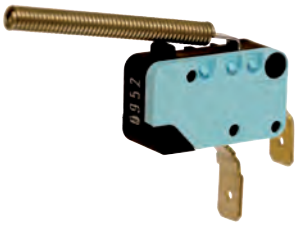
Use the 8 digit part numbers when they are defined

Other cases, precise:
Type of microswitch - Function - Connection - UL approval* - Actuator* - Fixing position* - Mounting accessories* - Adaptation*
* if needed
Example: 831618 C W6A5 UL 161L 70602118 SP9680

Standard product Product made to order • Contact us

Examples of special adaptations

Plastic lever with no play in rest position



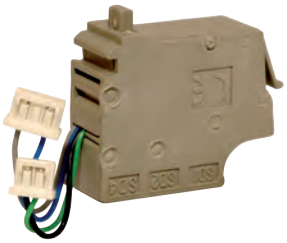
Spring lever for extra-long overtravel

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

Angled W3 terminals

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

Fully specific integrable switching module with terminal block for time switch



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

Door switch for industrial vehicle

MINIATURE MICROSWITCHES - STANDARD

V3D - 8326

- C-spring snap-action mechanism with wiping contacts
- Ratings from 0.02 A 24 V⎓ up to 25 A 250 V~ and 1 HP 125V~ / 2 HP 250 V~
- Broad range of operating forces from 0.25 N to 4 N
- Operating temperature from -50 °C up to +200 °C
- Wide choice of connections
- Housing material complying with IEC 60335-1 for unattended appliances: GWFI 850° C / GWIT 775° C
- ENEC and cURus approved
- Choice of pre-assembled actuators on 2 possible fixing positions

Main specifications

Function	Connections	Standard 83263	High current 83262	High force 83261	Low force 83264	Very low force 83265	Low current 83268	Low current Low force 83269
I (changeover)	W1	83263001	83262001	83261001	83264001	83265001	83268001	83269001
I (changeover)	W2	83263011	83262011	83261011	83264011	83265011	83268011	83269011
I (changeover)	W3	83263021	83262021	83261021	83264021	83265021	83268021	83269021
I (changeover)	W3R5	83263031	83262031	83261031	83264031	83265031	83268031	83269031
I (changeover)	W6A5	83263041	83262041	83261041	83264041	83265041	83268041	83269041
I (changeover)	W6D8	83263051	83262051	83261051	83264051	83265051	83268051	83269051
I (changeover)	W7A5	83263061	-	83261061	83264061	83265061	83268061	83269061
I (changeover)	X2	83263071	-	83261071	83264071	83265071	83268071	83269071
I (changeover)	X3	83263081	-	83261081	83264081	83265081	83268081	83269081
I (changeover)	X1	83263091	-	83261091	83264091	83265091	83268091	83269091
R (normally closed)	W1	83263601	83262601	83261601	83264601	83265601	83268601	83269601
R (normally closed)	W2	83263611	83262611	83261611	83264611	83265611	83268611	83269611
R (normally closed)	W3	83263621	83262621	83261621	83264621	83265621	83268621	83269621
R (normally closed)	W3R5	83263631	83262631	83261631	83264631	83265631	83268631	83269631
R (normally closed)	W6A5	83263641	83262641	83261641	83264641	83265641	83268641	83269641
R (normally closed)	W6D8	83263651	83262651	83261651	83264651	83265651	83268651	83269651
R (normally closed)	W7A5	83263661	-	83261661	83264661	83265661	83268661	83269661
C (normally open)	W1	83263801	83262801	83261801	83264801	83265801	83268801	83269801
C (normally open)	W2	83263811	83262811	83261811	83264811	83265811	83268811	83269811
C (normally open)	W3	83263821	83262821	83261821	83264821	83265821	83268821	83269821
C (normally open)	W3R5	83263831	83262831	83261831	83264831	83265831	83268831	83269831
C (normally open)	W6A5	83263841	83262841	83261841	83264841	83265841	83268841	83269841
C (normally open)	W6D8	83263851	83262851	83261851	83264851	83265851	83268851	83269851
C (normally open)	W7A5	83263861	-	83261861	83264861	83265861	83268861	83269861
Electrical characteristics								
Rating nominal / 250 V AC (A)		16	20	16	12	5	-	-
Rating thermal / 250 V AC (A)		20	25	20	15	7.5	-	-
Operating range / 5 →24 V AC/DC (A)		-	-	-	-	-	0.001 → 0.02	0.001 → 0.02
Rating ENEC/NF / 250 V AC (A)		16(4)	20(8)	16(4)	12(6)	5(1)	0.1(0.04)	0.1(0.04)
Rating UL / 125/250 V AC (A)		16	21	16	8	5	0.1	0.1
Rating UL HP / 125/250 V AC		-*	1HP/2HP	-*	1/4HP	1/10HP	-	-
Mechanical characteristics								
Maximum operating force (N)		1	2	2	0.5	0.25	1	0.25
Min. Release force (N)		0.2	0.5	0.5	0.1	0.05	0.2	0.05
Maximum total travel force (N)		1.5	3	3	0.8	0.4	1.5	0.4
Max. Allowable overtravel force (N)		20	20	20	20	20	20	20
Rest position max. (mm)		16.2	16.2	16.2	16.2	16.2	16.2	16.2
Operating position (mm)		14.7 ±0.5	14.7 ±0.5	14.7 ±0.5	14.7 ±0.5	14.7 ±0.5	14.7 ±0.5	14.7 ±0.5
Maximum differential travel (mm)		0.4	0.4	0.4	0.4	0.4	0.4	0.4
Min. overtravel (mm)		1.1	1.1	1.1	1.1	1.1	1.1	1.1
Ambient operating temperature (°C)		-50 → +125	-50 → +125	-50 → +125	-20 → +125	-20 → +125	-50 → +150	-20 → +150
Mechanical life for 2/3 OT (operations)		10^6	10^6	10^6	10^6	10^6	10^6	10^6
Contact gap (mm)		0.4	0.4	0.4	0.4	0.4	0.4	0.4
Weight (g)		6	6	6	6	6	6	6

* Also available with 1/2HP (83263 SP9333, 83261 SP9331)

Additional specifications

- Case, Button: PET GF (UL 94-V0 / GWFI 960 °C / GWIT 775 °C)
- Contacts: silver alloy or gold plated (83268/269)
- Terminals: brass, silver-plated brass (W2, X)
- Levers: stainless steel, polyamide roller
- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 250 (PTI 300 on request)
- Protection against electric shock: button and actuators mounted on position B have reinforced insulation for Ui 250V / Uimp 2,5kV / pollution 2
- Recommended min actuating speed: 83261/83262: 0.3 mm/s
  83263/83268: 1 mm/s
  83264/83265/83269: 3 mm/s

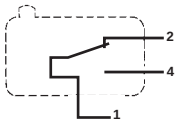
Standard product | Product made to order | ● Contact us

Product adaptations

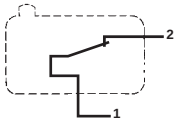
- Special levers: special shapes and lengths
- Lever mounted on position A for higher ratio
- Special connections: angled, screw with clamp (W5-SP9348), solder with enlarged hole (W2-SP9368), RAST 2.5 (W3R2.5-SP9307), …
- Higher operating force: max 4 N (83261 SP9335, 83262 SP9347)
- +200 °C versions: max 8A, ENEC and cURus approved (83261-83263-83268-83269 SP9328)
- 25 A cURus approved version (83262 SP9360)
- Telescopic plunger and adjustable fixing by threaded barrel: plastic and metal versions (consult us)

Principles

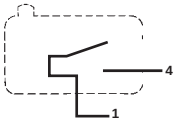
Single break snap-action switch
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)

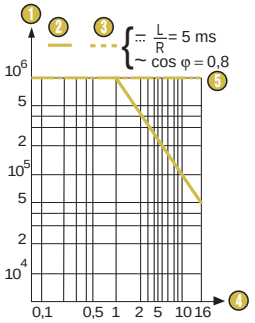


Normally open - SPST-NO (form A)



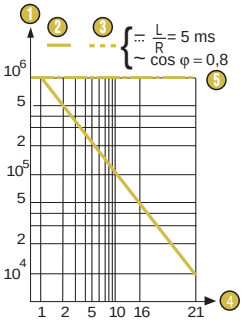
Curves

Operating curve for types 83261 / 83263



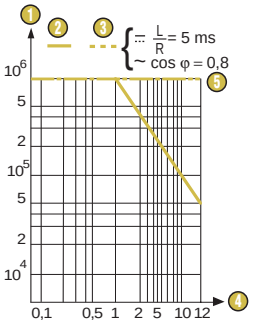
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Current in Amps
5. Mechanical life limit

Operating curve for type 83262



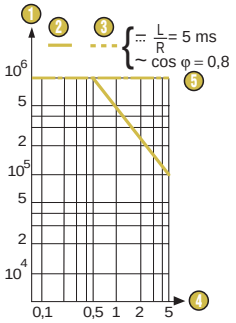
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Current in Amps
5. Mechanical life limit

Operating curve for type 83264



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

Operating curve for type 83265



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

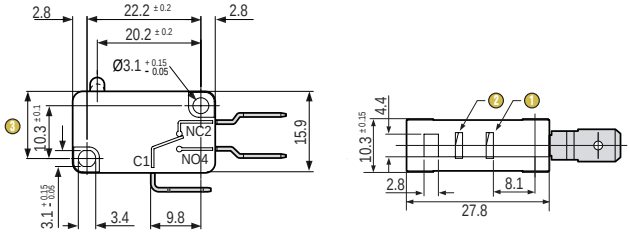
Electrical life for 83268/83269: 24 V⁓/⎓ 5 mA: 20 000 cycles*
12 V⁓/⎓ 10 mA: 20 000 cycles*

***** For longer electrical life, please consult us

Dimensions

Product

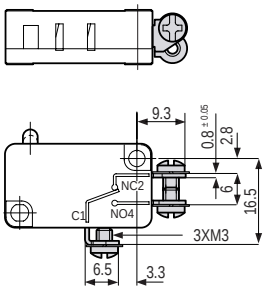
8326



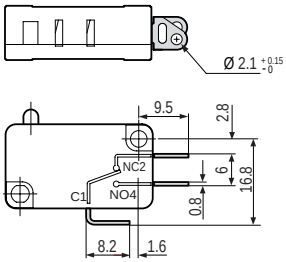
1. Lever mounting position B (standard)
2. Lever mounting position A (optional)
3. Total travel position = 13.2 max

Connections

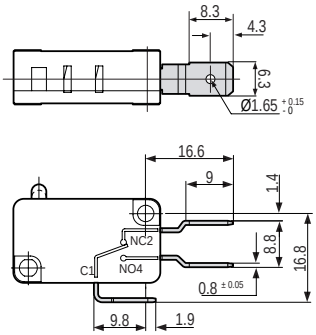
W1 screw



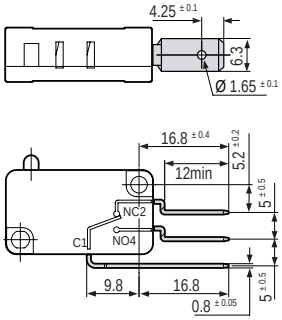
W2 solder



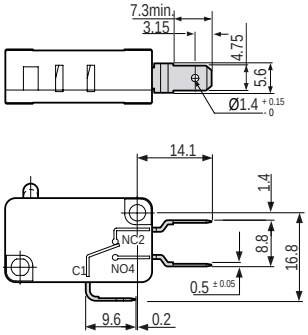
W3 quick-connect 6.3 x 0.8



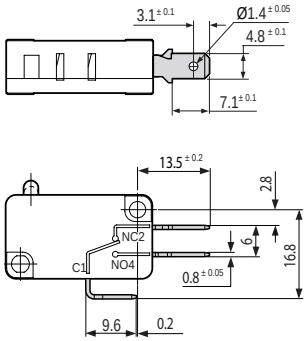
W3R5 quick-connect 6.3 x 0.8 for RAST 5 connector



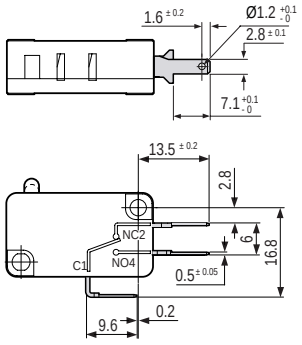
W6A5 quick-connect 4.8 x 0.5



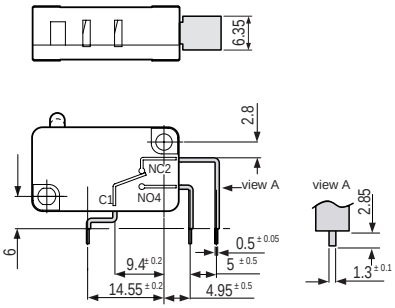
W6D8 quick-connect 4.8 x 0.8



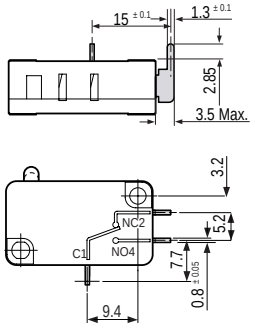
W7A5 quick-connect 2.8 x 0.5



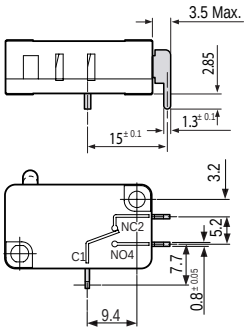
X1 for printed circuit board, straight output



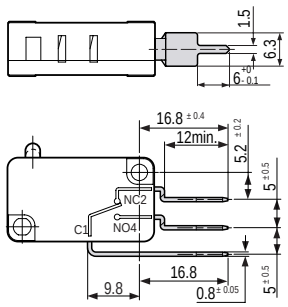
X2 for printed circuit board, rear output



X3 for printed circuit board, front output

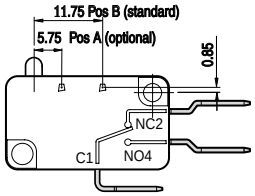


W3R2.5 for RAST 2.5 connector (SP9307)



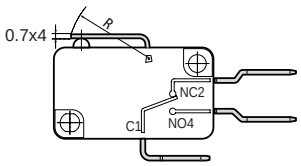
Other shapes and dimensions: consult us

Actuator mounting positions

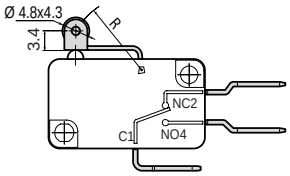


Actuators

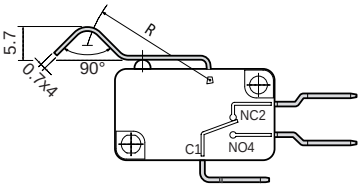
260A flat



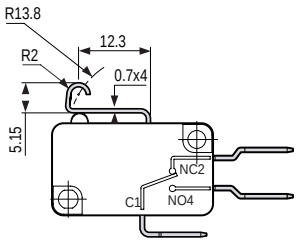
260E roller



260F dummy roller

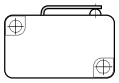
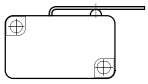
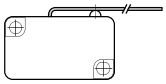
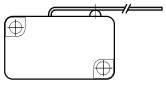
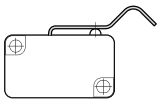
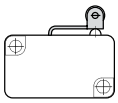
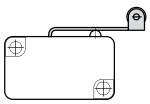
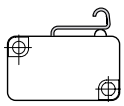


260G dummy roller

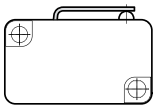
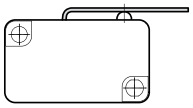
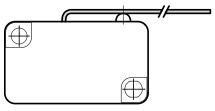


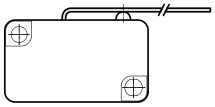
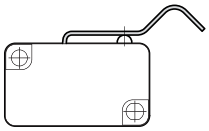
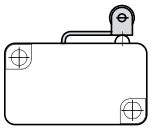
Other shapes and dimensions: consult us

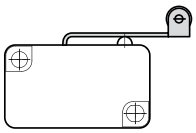
Actuators and mounting accessories

Mechanical characteristics		Length of actuator (mm)	Maximum operating force (N)	Minimum release force (N)	Operating position (mm)	Minimum overtravel (mm)	Maximum differential travel (mm)	Maximum total travel (mm)
 Lever 260A R14.2 Pos B	**83261**	14.2	2	0.5	$15.4^{\pm0.5}$	1.1	0.4	3
	83262	14.2	2	0.5	$15.4^{\pm0.5}$	1.1	0.4	3
	83263	14.2	1	0.2	$15.4^{\pm0.5}$	1.1	0.4	3
	83264	14.2	0.5	0.1	$15.4^{\pm0.5}$	1.1	0.4	3
	83265	14.2	0.25	0.05	$15.4^{\pm0.5}$	1.1	0.4	3
	83268	14.2	1	0.2	$15.4^{\pm0.5}$	1.1	0.4	3
	83269	14.2	0.25	0.05	$15.4^{\pm0.5}$	1.1	0.4	3
 Lever 260A R25.4 Pos B	**83261**	25.4	1	0.25	$15.4^{\pm1}$	2	0.8	5.8
	83262	25.4	1	0.25	$15.4^{\pm1}$	2	0.8	5.8
	83263	25.4	0.5	0.1	$15.4^{\pm1}$	2	0.8	5.8
	83264	25.4	0.25	0.05	$15.4^{\pm1}$	2	0.8	5.8
	83265	25.4	0.13	0.02	$15.4^{\pm1}$	2	0.8	5.8
	83268	25.4	0.5	0.1	$15.4^{\pm1}$	2	0.8	5.8
	83269	25.4	0.13	0.02	$15.4^{\pm1}$	2	0.8	5.8
 Lever 260A R40 Pos B	**83261**	40	0.6	0.15	$15.4^{\pm1.8}$	3.3	1.3	9.6
	83262	40	0.6	0.15	$15.4^{\pm1.8}$	3.3	1.3	9.6
	83263	40	0.3	0.06	$15.4^{\pm1.8}$	3.3	1.3	9.6
	83264	40	0.15	0.03	$15.4^{\pm1.8}$	3.3	1.3	9.6
	83265	40	0.08	0.01	$15.4^{\pm1.8}$	3.3	1.3	9.6
	83268	40	0.3	0.06	$15.4^{\pm1.8}$	3.3	1.3	9.6
	83269	40	0.08	0.01	$15.4^{\pm1.8}$	3.3	1.3	9.6
 Lever 260A R60 Pos B	**83261**	60	0.4	0.1	$15.4^{\pm2.5}$	5	2	14.5
	83262	60	0.4	0.1	$15.4^{\pm2.5}$	5	2	14.5
	83263	60	0.2	0.04	$15.4^{\pm2.5}$	5	2	14.5
	83264	60	0.1	0.02	$15.4^{\pm2.5}$	5	2	14.5
	83265	60	0.05	0.01	$15.4^{\pm2.5}$	5	2	14.5
	83268	60	0.2	0.04	$15.4^{\pm2.5}$	5	2	14.5
	83269	60	0.05	0.01	$15.4^{\pm2.5}$	5	2	14.5
 Lever 260F R22.2 Pos B	**83261**	22.2	1.06	0.26	$20.4^{\pm1}$	1.8	0.75	5.2
	83262	22.2	1.06	0.26	$20.4^{\pm1}$	1.8	0.75	5.2
	83263	22.2	0.53	0.1	$20.4^{\pm1}$	1.8	0.75	5.2
	83264	22.2	0.27	0.05	$20.4^{\pm1}$	1.8	0.75	5.2
	83265	22.2	0.13	0.02	$20.4^{\pm1}$	1.8	0.75	5.2
	83268	22.2	0.53	0.1	$20.4^{\pm1}$	1.8	0.75	5.2
	83269	22.2	0.13	0.02	$20.4^{\pm1}$	1.8	0.75	5.2
 Lever 260E R13.7 Pos B	**83261**	13.7	2	0.5	$20.5^{\pm0.8}$	1.1	0.4	3
	83262	13.7	2	0.5	$20.5^{\pm0.8}$	1.1	0.4	3
	83263	13.7	1	0.2	$20.5^{\pm0.8}$	1.1	0.4	3
	83264	13.7	0.5	0.1	$20.5^{\pm0.8}$	1.1	0.4	3
	83265	13.7	0.25	0.05	$20.5^{\pm0.8}$	1.1	0.4	3
	83268	13.7	1	0.2	$20.5^{\pm0.8}$	1.1	0.4	3
	83269	13.7	0.25	0.05	$20.5^{\pm0.8}$	1.1	0.4	3
 Lever 260E R24.3 Pos B	**83261**	24.3	1	0.25	$20.5^{\pm1.5}$	2	0.8	5.8
	83262	24.3	1	0.25	$20.5^{\pm1.5}$	2	0.8	5.8
	83263	24.3	0.5	0.1	$20.5^{\pm1.5}$	2	0.8	5.8
	83264	24.3	0.25	0.05	$20.5^{\pm1.5}$	2	0.8	5.8
	83265	24.3	0.13	0.02	$20.5^{\pm1.5}$	2	0.8	5.8
	83268	24.3	0.5	0.1	$20.5^{\pm1.5}$	2	0.8	5.8
	83269	24.3	0.13	0.02	$20.5^{\pm1.5}$	2	0.8	5.8
 Lever 260G R13.8 Pos B	**83261**	13.8	2	0.5	$19.9^{\pm0.7}$	1.1	0.4	3
	83262	13.8	2	0.5	$19.9^{\pm0.7}$	1.1	0.4	3
	83263	13.8	1	0.2	$19.9^{\pm0.7}$	1.1	0.4	3
	83264	13.8	0.5	0.1	$19.9^{\pm0.7}$	1.1	0.4	3
	83265	13.8	0.25	0.05	$19.9^{\pm0.7}$	1.1	0.4	3
	83268	13.8	1	0.2	$19.9^{\pm0.7}$	1.1	0.4	3
	83269	13.8	0.25	0.05	$19.9^{\pm0.7}$	1.1	0.4	3

V3D - 8326 with referenced actuators

Actuators	Function	Type / Connection	83261	83262	83263	83264	83265	83268	83269
 Lever 260A R14.2 Pos B	I	W1	83261002	83262002	83263002	83264002	83265002	83268002	83269002
	I	W2	83261012	83262012	83263012	83264012	83265012	83268012	83269012
	I	W3	83261022	83262022	83263022	83264022	83265022	83268022	83269022
	I	W3R5	83261032	83262032	83263032	83264032	83265032	83268032	83269032
	I	W6A5	83261042	83262042	83263042	83264042	83265042	83268042	83269042
	I	W6D8	83261052	83262052	83263052	83264052	83265052	83268052	83269052
	I	W7A5	83261062	-	83263062	83264062	83265062	83268062	83269062
	I	X2	83261072	-	83263072	83264072	83265072	83268072	83269072
	I	X3	83261082	-	83263082	83264082	83265082	83268082	83269082
	I	X1	83261092	-	83263092	83264092	83265092	83268092	83269092
	R	W1	83261602	83262602	83263602	83264602	83265602	83268602	83269602
	R	W2	83261612	83262612	83263612	83264612	83265612	83268612	83269612
	R	W3	83261622	83262622	83263622	83264622	83265622	83268622	83269622
	R	W3R5	83261632	83262632	83263632	83264632	83265632	83268632	83269632
	R	W6A5	83261642	83262642	83263642	83264642	83265642	83268642	83269642
	R	W6D8	83261652	83262652	83263652	83264652	83265652	83268652	83269652
	R	W7A5	83261662	-	83263662	83264662	83265662	83268662	83269662
	C	W1	83261802	83262802	83263802	83264802	83265802	83268802	83269802
	C	W2	83261812	83262812	83263812	83264812	83265812	83268812	83269812
	C	W3	83261822	83262822	83263822	83264822	83265822	83268822	83269822
	C	W3R5	83261832	83262832	83263832	83264832	83265832	83268832	83269832
	C	W6A5	83261842	83262842	83263842	83264842	83265842	83268842	83269842
	C	W6D8	83261852	83262852	83263852	83264852	83265852	83268852	83269852
	C	W7A5	83261862	-	83263862	83264862	83265862	83268862	83269862
 Lever 260A R25.4 Pos B	I	W1	83261003	83262003	83263003	83264003	83265003	83268003	83269003
	I	W2	83261013	83262013	83263013	83264013	83265013	83268013	83269013
	I	W3	83261023	83262023	83263023	83264023	83265023	83268023	83269023
	I	W3R5	83261033	83262033	83263033	83264033	83265033	83268033	83269033
	I	W6A5	83261043	83262043	83263043	83264043	83265043	83268043	83269043
	I	W6D8	83261053	83262053	83263053	83264053	83265053	83268053	83269053
	I	W7A5	83261063	-	83263063	83264063	83265063	83268063	83269063
	I	X2	83261073	-	83263073	83264073	83265073	83268073	83269073
	I	X3	83261083	-	83263083	83264083	83265083	83268083	83269083
	I	X1	83261093	-	83263093	83264093	83265093	83268093	83269093
	R	W1	83261603	83262603	83263603	83264603	83265603	83268603	83269603
	R	W2	83261613	83262613	83263613	83264613	83265613	83268613	83269613
	R	W3	83261623	83262623	83263623	83264623	83265623	83268623	83269623
	R	W3R5	83261633	83262633	83263633	83264633	83265633	83268633	83269633
	R	W6A5	83261643	83262643	83263643	83264643	83265643	83268643	83269643
	R	W6D8	83261653	83262653	83263653	83264653	83265653	83268653	83269653
	R	W7A5	83261663	-	83263663	83264663	83265663	83268663	83269663
	C	W1	83261803	83262803	83263803	83264803	83265803	83268803	83269803
	C	W2	83261813	83262813	83263813	83264813	83265813	83268813	83269813
	C	W3	83261823	83262823	83263823	83264823	83265823	83268823	83269823
	C	W3R5	83261833	83262833	83263833	83264833	83265833	83268833	83269833
	C	W6A5	83261843	83262843	83263843	83264843	83265843	83268843	83269843
	C	W6D8	83261853	83262853	83263853	83264853	83265853	83268853	83269853
	C	W7A5	83261863	-	83263863	83264863	83265863	83268863	83269863
 Lever 260A R40 Pos B	I	W1	83261004	83262004	83263004	83264004	83265004	83268004	83269004
	I	W2	83261014	83262014	83263014	83264014	83265014	83268014	83269014
	I	W3	83261024	83262024	83263024	83264024	83265024	83268024	83269024
	I	W3R5	83261034	83262034	83263034	83264034	83265034	83268034	83269034
	I	W6A5	83261044	83262044	83263044	83264044	83265044	83268044	83269044
	I	W6D8	83261054	83262054	83263054	83264054	83265054	83268054	83269054
	I	W7A5	83261064	-	83263064	83264064	83265064	83268064	83269064
	I	X2	83261074	-	83263074	83264074	83265074	83268074	83269074
	I	X3	83261084	-	83263084	83264084	83265084	83268084	83269084
	I	X1	83261094	-	83263094	83264094	83265094	83268094	83269094
	R	W1	83261604	83262604	83263604	83264604	83265604	83268604	83269604
	R	W2	83261614	83262614	83263614	83264614	83265614	83268614	83269614
	R	W3	83261624	83262624	83263624	83264624	83265624	83268624	83269624
	R	W3R5	83261634	83262634	83263634	83264634	83265634	83268634	83269634
	R	W6A5	83261644	83262644	83263644	83264644	83265644	83268644	83269644
	R	W6D8	83261654	83262654	83263654	83264654	83265654	83268654	83269654
	R	W7A5	83261664	-	83263664	83264664	83265664	83268664	83269664
	C	W1	83261804	83262804	83263804	83264804	83265804	83268804	83269804
	C	W2	83261814	83262814	83263814	83264814	83265814	83268814	83269814
	C	W3	83261824	83262824	83263824	83264824	83265824	83268824	83269824
	C	W3R5	83261834	83262834	83263834	83264834	83265834	83268834	83269834
	C	W6A5	83261844	83262844	83263844	83264844	83265844	83268844	83269844
	C	W6D8	83261854	83262854	83263854	83264854	83265854	83268854	83269854
	C	W7A5	83261864	-	83263864	83264864	83265864	83268864	83269864

Actuators	Function	Type / Connection	83261	83262	83263	83264	83265	83268	83269
 Lever 260A R60 Pos B	I	W1	83261005	83262005	83263005	83264005	83265005	83268005	83269005
	I	W2	83261015	83262015	83263015	83264015	83265015	83268015	83269015
	I	W3	83261025	83262025	83263025	83264025	83265025	83268025	83269025
	I	W3R5	83261035	83262035	83263035	83264035	83265035	83268035	83269035
	I	W6A5	83261045	83262045	83263045	83264045	83265045	83268045	83269045
	I	W6D8	83261055	83262055	83263055	83264055	83265055	83268055	83269055
	I	W7A5	83261065	-	83263065	83264065	83265065	83268065	83269065
	I	X2	83261075	-	83263075	83264075	83265075	83268075	83269075
	I	X3	83261085	-	83263085	83264085	83265085	83268085	83269085
	I	X1	83261095	-	83263095	83264095	83265095	83268095	83269095
	R	W1	83261605	83262605	83263605	83264605	83265605	83268605	83269605
	R	W2	83261615	83262615	83263615	83264615	83265615	83268615	83269615
	R	W3	83261625	83262625	83263625	83264625	83265625	83268625	83269625
	R	W3R5	83261635	83262635	83263635	83264635	83265635	83268635	83269635
	R	W6A5	83261645	83262645	83263645	83264645	83265645	83268645	83269645
	R	W6D8	83261655	83262655	83263655	83264655	83265655	83268655	83269655
	R	W7A5	83261665	-	83263665	83264665	83265665	83268665	83269665
	C	W1	83261805	83262805	83263805	83264805	83265805	83268805	83269805
	C	W2	83261815	83262815	83263815	83264815	83265815	83268815	83269815
	C	W3	83261825	83262825	83263825	83264825	83265825	83268825	83269825
	C	W3R5	83261835	83262835	83263835	83264835	83265835	83268835	83269835
	C	W6A5	83261845	83262845	83263845	83264845	83265845	83268845	83269845
	C	W6D8	83261855	83262855	83263855	83264855	83265855	83268855	83269855
	C	W7A5	83261865	-	83263865	83264865	83265865	83268865	83269865
 Lever 260F R22.2 Pos B	I	W1	83261006	83262006	83263006	83264006	83265006	83268006	83269006
	I	W2	83261016	83262016	83263016	83264016	83265016	83268016	83269016
	I	W3	83261026	83262026	83263026	83264026	83265026	83268026	83269026
	I	W3R5	83261036	83262036	83263036	83264036	83265036	83268036	83269036
	I	W6A5	83261046	83262046	83263046	83264046	83265046	83268046	83269046
	I	W6D8	83261056	83262056	83263056	83264056	83265056	83268056	83269056
	I	W7A5	83261066	-	83263066	83264066	83265066	83268066	83269066
	I	X2	83261076	-	83263076	83264076	83265076	83268076	83269076
	I	X3	83261086	-	83263086	83264086	83265086	83268086	83269086
	I	X1	83261096	-	83263096	83264096	83265096	83268096	83269096
	R	W1	83261606	83262606	83263606	83264606	83265606	83268606	83269606
	R	W2	83261616	83262616	83263616	83264616	83265616	83268616	83269616
	R	W3	83261626	83262626	83263626	83264626	83265626	83268626	83269626
	R	W3R5	83261636	83262636	83263636	83264636	83265636	83268636	83269636
	R	W6A5	83261646	83262646	83263646	83264646	83265646	83268646	83269646
	R	W6D8	83261656	83262656	83263656	83264656	83265656	83268656	83269656
	R	W7A5	83261666	-	83263666	83264666	83265666	83268666	83269666
	C	W1	83261806	83262806	83263806	83264806	83265806	83268806	83269806
	C	W2	83261816	83262816	83263816	83264816	83265816	83268816	83269816
	C	W3	83261826	83262826	83263826	83264826	83265826	83268826	83269826
	C	W3R5	83261836	83262836	83263836	83264836	83265836	83268836	83269836
	C	W6A5	83261846	83262846	83263846	83264846	83265846	83268846	83269846
	C	W6D8	83261856	83262856	83263856	83264856	83265856	83268856	83269856
	C	W7A5	83261866	-	83263866	83264866	83265866	83268866	83269866
 Lever 260E R13.7 Pos B	I	W1	83261007	83262007	83263007	83264007	83265007	83268007	83269007
	I	W2	83261017	83262017	83263017	83264017	83265017	83268017	83269017
	I	W3	83261027	83262027	83263027	83264027	83265027	83268027	83269027
	I	W3R5	83261037	83262037	83263037	83264037	83265037	83268037	83269037
	I	W6A5	83261047	83262047	83263047	83264047	83265047	83268047	83269047
	I	W6D8	83261057	83262057	83263057	83264057	83265057	83268057	83269057
	I	W7A5	83261067	-	83263067	83264067	83265067	83268067	83269067
	I	X2	83261077	-	83263077	83264077	83265077	83268077	83269077
	I	X3	83261087	-	83263087	83264087	83265087	83268087	83269087
	I	X1	83261097	-	83263097	83264097	83265097	83268097	83269097
	R	W1	83261607	83262607	83263607	83264607	83265607	83268607	83269607
	R	W2	83261617	83262617	83263617	83264617	83265617	83268617	83269617
	R	W3	83261627	83262627	83263627	83264627	83265627	83268627	83269627
	R	W3R5	83261637	83262637	83263637	83264637	83265637	83268637	83269637
	R	W6A5	83261647	83262647	83263647	83264647	83265647	83268647	83269647
	R	W6D8	83261657	83262657	83263657	83264657	83265657	83268657	83269657
	R	W7A5	83261667	-	83263667	83264667	83265667	83268667	83269667
	C	W1	83261807	83262807	83263807	83264807	83265807	83268807	83269807
	C	W2	83261817	83262817	83263817	83264817	83265817	83268817	83269817
	C	W3	83261827	83262827	83263827	83264827	83265827	83268827	83269827
	C	W3R5	83261837	83262837	83263837	83264837	83265837	83268837	83269837
	C	W6A5	83261847	83262847	83263847	83264847	83265847	83268847	83269847
	C	W6D8	83261857	83262857	83263857	83264857	83265857	83268857	83269857
	C	W7A5	83261867	-	83263867	83264867	83265867	83268867	83269867

Actuators	Type	83261	83262	83263	83264	83265	83268	83269
Function	Connection							
 Lever 260E R24.3 Pos B	I	W1	83261008	83262008	83263008	83264008	83265008	83268008	83269008
	I	W2	83261018	83262018	83263018	83264018	83265018	83268018	83269018
	I	W3	83261028	83262028	83263028	83264028	83265028	83268028	83269028
	I	W3R5	83261038	83262038	83263038	83264038	83265038	83268038	83269038
	I	W6A5	83261048	83262048	83263048	83264048	83265048	83268048	83269048
	I	W6D8	83261058	83262058	83263058	83264058	83265058	83268058	83269058
	I	W7A5	83261068	-	83263068	83264068	83265068	83268068	83269068
	I	X2	83261078	-	83263078	83264078	83265078	83268078	83269078
	I	X3	83261088	-	83263088	83264088	83265088	83268088	83269088
	I	X1	83261098	-	83263098	83264098	83265098	83268098	83269098
	R	W1	83261608	83262608	83263608	83264608	83265608	83268608	83269608
	R	W2	83261618	83262618	83263618	83264618	83265618	83268618	83269618
	R	W3	83261628	83262628	83263628	83264628	83265628	83268628	83269628
	R	W3R5	83261638	83262638	83263638	83264638	83265638	83268638	83269638
	R	W6A5	83261648	83262648	83263648	83264648	83265648	83268648	83269648
	R	W6D8	83261658	83262658	83263658	83264658	83265658	83268658	83269658
	R	W7A5	83261668	-	83263668	83264668	83265668	83268668	83269668
	C	W1	83261808	83262808	83263808	83264808	83265808	83268808	83269808
	C	W2	83261818	83262818	83263818	83264818	83265818	83268818	83269818
	C	W3	83261828	83262828	83263828	83264828	83265828	83268828	83269828
	C	W3R5	83261838	83262838	83263838	83264838	83265838	83268838	83269838
	C	W6A5	83261848	83262848	83263848	83264848	83265848	83268848	83269848
	C	W6D8	83261858	83262858	83263858	83264858	83265858	83268858	83269858
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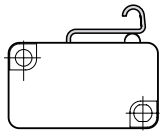
 Lever 260G R13.8 Pos B	I	W1	83261009	83262009	83263009	83264009	83265009	83268009	83269009
	I	W2	83261019	83262019	83263019	83264019	83265019	83268019	83269019
	I	W3	83261029	83262029	83263029	83264029	83265029	83268029	83269029
	I	W3R5	83261039	83262039	83263039	83264039	83265039	83268039	83269039
	I	W6A5	83261049	83262049	83263049	83264049	83265049	83268049	83269049
	I	W6D8	83261059	83262059	83263059	83264059	83265059	83268059	83269059
	I	W7A5	83261069	-	83263069	83264069	83265069	83268069	83269069
	I	X2	83261079	-	83263079	83264079	83265079	83268079	83269079
	I	X3	83261089	-	83263089	83264089	83265089	83268089	83269089
	I	X1	83261099	-	83263099	83264099	83265099	83268099	83269099
	R	W1	83261609	83262609	83263609	83264609	83265609	83268609	83269609
	R	W2	83261619	83262619	83263619	83264619	83265619	83268619	83269619
	R	W3	83261629	83262629	83263629	83264629	83265629	83268629	83269629
	R	W3R5	83261639	83262639	83263639	83264639	83265639	83268639	83269639
	R	W6A5	83261649	83262649	83263649	83264649	83265649	83268649	83269649
	R	W6D8	83261659	83262659	83263659	83264659	83265659	83268659	83269659
	R	W7A5	83261669	-	83263669	83264669	83265669	83268669	83269669
	C	W1	83261809	83262809	83263809	83264809	83265809	83268809	83269809
	C	W2	83261819	83262819	83263819	83264819	83265819	83268819	83269819
	C	W3	83261829	83262829	83263829	83264829	83265829	83268829	83269829
	C	W3R5	83261839	83262839	83263839	83264839	83265839	83268839	83269839
	C	W6A5	83261849	83262849	83263849	83264849	83265849	83268849	83269849
	C	W6D8	83261859	83262859	83263859	83264859	83265859	83268859	83269859
	C	W7A5	83261869	-	83263869	83264869	83265869	83268869	83269869

Installation recommendations

See “Basic technical concepts”

How to order

Use 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch + Function + Connection + Actuator* + Fixing position* - Adaptation*
Example: 83263 I W3 260E R13.7 A SP9328

MINIATURE MICROSWITCHES - SEALED

V3S - 83169

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

Main specifications

Function	Connections	Standard 831690	Reduced differential travel 831694	Dual-current 831698	Dual-current Reduced differential travel 831699
I (changeover)	D0.5	**83169002**	**83169405**	**83169802**	**83169905**
I (changeover)	G0.5	**83169001**	**83169404**	**83169801**	**83169904**
I (changeover)	C0.5	**83169015**	**83169406**	**83169803**	**83169906**
I (changeover)	Y0.5	**83169046**	**83169442**	**83169820**	**83169913**
I (changeover)	D - G - C - Y *	●	●	●	●
R (normally closed)	D - G - C - Y *	●	●	●	●
C (normally open)	D - G - C - Y *	●	●	●	●

* wire length or cable length on demand

Electrical characteristics				
Rating nominal / 250 V AC (A)	8	5	5**	5**
Rating thermal / 250 V AC (A)	10	6	6	6
Mechanical characteristics				
Maximum operating force (N)	4.5	4.5	4.5	4.5
Min. Release force (N)	1	1	1	1
Maximum total travel force (N)	8	8	8	8
Max. Allowable overtravel force (N)	20	20	20	20
Rest position max. (mm)	15.9	15.9	15.9	15.9
Operating position (mm)	$14.7^{\pm 0.5}$	$14.7^{\pm 0.5}$	$14.7^{\pm 0.5}$	$14.7^{\pm 0.5}$
Maximum differential travel (mm)	0.35	0.07	0.35	0.07
Min. overtravel (mm)	1	0.4	1	0.4
Ambient operating temperature-wires (°C)	-40 → +105 °C	-40 → +105 °C	-40 → +105 °C	-40 → +105 °C
Ambient operating temperature-cable (°C)	-40 → +90°C	-40 → +90 °C	-40 → +90 °C	-40 → +90 °C
Mechanical life (operations)	5×10^6	5×10^6	5×10^6	5×10^6
Contact gap (mm)	0.4	0.4	0.4	0.4
Weight (g)	30	30	30	30

Additional specifications

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

Product adaptations

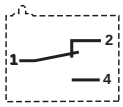
- **Special levers: special shapes and lengths, flexible levers, adjustable, pinned, ….**
- **Special leads and cables, EN 50306 halogen free versions, full wiring with custom connector**
- **High operating temperature: +130 °C**
- **Long overtravel variant (min 3.5 mm) with metal or plastic plunger,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

Standard product | Product made to order | ● Contact us

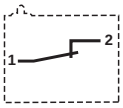
Principles

Single break snap-action switch

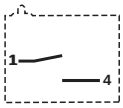
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)

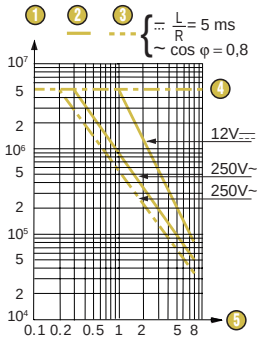


Normally open - SPST-NO (form A)

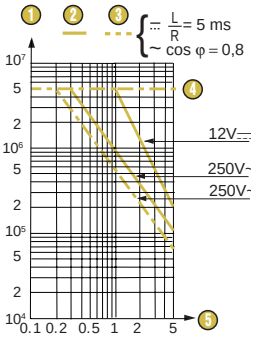


Curves

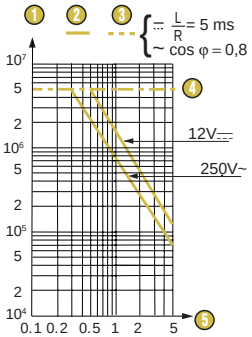
Operating curve for type 831690



Operating curve for type 831694



Operating curve for types 831698/831699



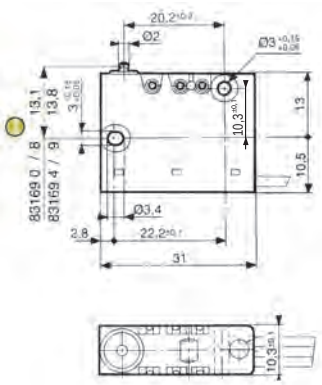
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

** Models 831698 and 831699 are designed to operate equally well on low-current (1 mA 4 V minimum recommended) or medium-current (5 A maximum) circuits. However, a given product should only be used to switch one type of circuit during its working life.

Dimensions

Product

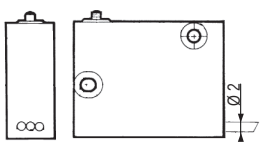
83169



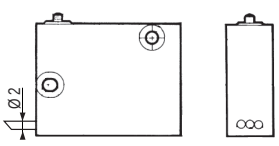
1 Total travel position

Connections

D wire output on right

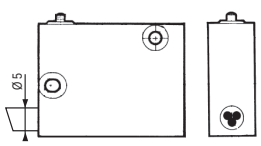


G wire output on left

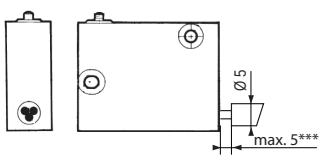


Wire characteristics:
1: black (common)
2: brown (NC)
4: blue (NO)
Cross section: 1 mm²
Standard length: 0.5 m (other lengths on request)

C cable output on left



Y cable output on right

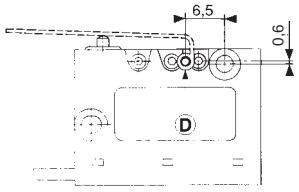


***Outer jacket stripping

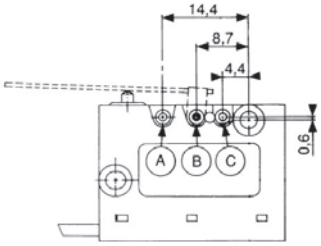
Cable characteristics:
1: black (common)
2: brown (NC)
4: grey (NO)
Cross section: 3 x 0.75 or 2 x 0.75 mm²
Standard length: 0.5 m (other lengths on request)

Actuator mounting positions

139-type levers (pinned)

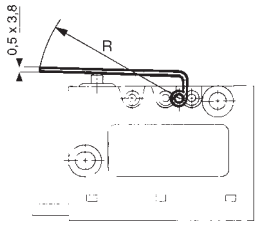


161-type levers (clipped-on)

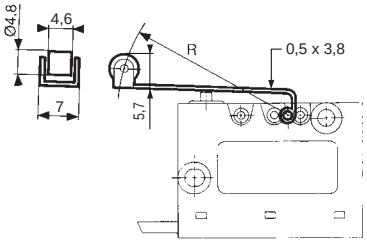


Actuators

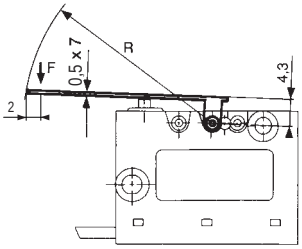
139AX flat



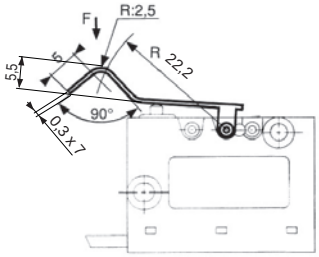
139EX roller



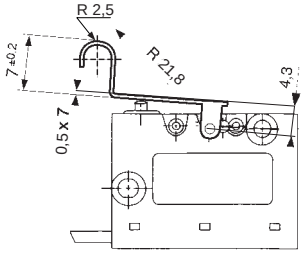
161A flat



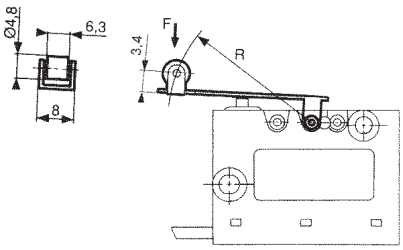
161F dummy roller



161G dummy roller

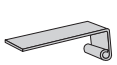
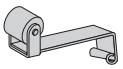


161E roller



Other shapes and dimensions: consult us

Actuators and mounting accessories

Part numbers for standard actuators				79215740		70507524			79215742		70507529		
Actuators		Flat **139 AX** R29.7*	Roller **139 EX** R28.7*	Flat **161A** R14.2		Flat **161A** R25.4			Roller **161E** R13.6		Roller **161E** R24.1		
													
Fixing position		D	D	A	B	A	B	C	A	B	A	B	C
Operating force - max.	N	2.5	2.5	2.5	4.5	1.4	2.5	3.5	2.5	4.5	1.4	2.5	3.5
Release force - min.	N	0.4	0.4	0.5	1	0.25	0.5	0.6	0.5	1	0.25	0.5	0.6
Operating position	mm	$14.3^{\pm1.2}$	$19.4^{\pm1.3}$	$15.1^{\pm1.2}$	$15.2^{\pm0.6}$	$14.5^{\pm2.4}$	$15^{\pm1.2}$	$15.2^{\pm0.9}$	$20.4^{\pm1.2}$	$20.5^{\pm0.6}$	$19.7^{\pm2.4}$	$20.1^{\pm1.2}$	$20.3^{\pm0.9}$
Differential travel - max. (831690/8)	mm	1.2	1.2	0.8	0.4	1.6	0.8	0.6	0.8	0.4	1.6	0.8	0.6

Part numbers for standard actuators		70507528		79218651	
Actuators		Dummy roller **161F** R22.2		Dummy roller **161G** R21.8	
					
Fixing position		A	B	A	B
Operating force - max.	N	1.5	2.6	1.5	2.6
Release force - min.	N	0.25	0.5	0.25	0.5
Operating position	mm	$19.8^{\pm2.2}$	$20.2^{\pm1.1}$	$20.8^{\pm2.2}$	$21.2^{\pm1.1}$
Differential travel max. (831690/8)	mm	1.6	0.8	1.6	0.8

Unless mentioned specifically, 161-type levers are supplied unassembled.
For factory mounting, specify mounting position A, B or C.
* 139-type levers are factory mounted.

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

V3S-83169 microswitches with referenced actuators

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

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch - Function - Connection - UL approval* - Actuator* - Fixing position* - Adaptation*
* if needed
Example: 831690 R D1.50 UL 161E R24.1 B

Standard product Product made to order • Contact us

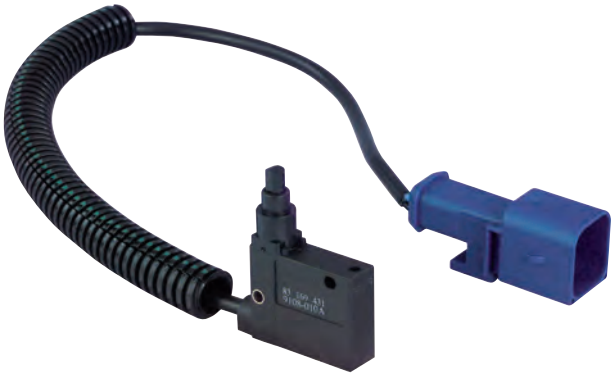
Examples of special adaptations

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

Long overtravel variant with metal plunger (SP4978)

Adjustable fixing by threaded barrel and telescopic plunger: see 83581

Double insulation model with plastic plunger (SP4965)



Full wiring with custom connector

MINIATURE MICROSWITCHES - HEAVY DUTY

83160

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

Main specifications

Function	Connections	Standard 831600	Reduced force 831603	Low force 831604	Wide contact gap 831606	High DC rating 831606 SP 3697
I (changeover)	W2	83160005	83160320	83160420	83160602	83160664
I (changeover)	W3	83160006	83160301	83160401	83160601	83160679
I (changeover)	W6	83160045	83160321	83160415	●*	●*
I (changeover)	X1-X2	●	●	●	●*	●*
I (changeover)	X3	83160143	●	●	●*	●*
R (normally closed)	W2	83160001	●	●	●	●
R (normally closed)	W3	83160003	83160319	●	83160621	●
R (normally closed)	W6	●	●	●	●*	●*
R (normally closed)	X2-X3	●	●	●	●*	●*
C (normally open)	W2	83160002	83160324	●	83160603	●
C (normally open)	W3	83160004	83160316	83160402	83160622	●
C (normally open)	W6	83160047	●	●	●*	●*
C (normally open)	X2-X3	●	●	●	●*	●*
Electrical characteristics						
Rating nominal / 250 V AC (A)		16	10	6	16	16
Rating nominal / 250 V DC (A) **		0.5	0.5	0.4	0.8	5
Rating thermal / 250 V (A)		20	15	10	20	20
Rating NF / 250 V AC (A)		16(4)	10(4)	6(2)	16(4)	-
Rating UL / 125/250 V AC (A)		8	8	6	10	-
Mechanical characteristics						
Maximum operating force (N)		4	2	1	5	5
Min. Release force (N)		1.5	0.6	0.3	1	1
Maximum total travel force (N)		6.5	3	1.5	7	7
Max. Allowable overtravel force (N)		20	20	20	20	20
Rest position max. (mm)		15.6	15.6	15.6	15.7	15.7
Operating position (mm)		$14.8^{\pm 0.3}$	$14.8^{\pm 0.3}$	$14.7^{\pm 0.3}$	$14.6^{\pm 0.4}$	$14.6^{\pm 0.4}$
Maximum differential travel (mm)		0.3	0.4	0.35	0.7	0.7
Min. overtravel CRA (mm)		1.3	1.3	1.3	1	1
Ambient operating temperature (°C)		-40 → +125	-40 → +125	-40 → +125	-40 → +125	-40 → +125
Mechanical life (operations)		10^7	10^7	10^7	10^6	10^6
Contact gap (mm)		1.2	1.2	1.2	3.2	3.2
Weight (g)		6.7	6.7	6.7	6.7	6.7

* Please consult us ** with resistive load

Additional specifications

- Case, Button: PBT GF (UL 94-V0 / GWFI 960 °C)
  PA66 GF (GWFI 960 °C) - 831606 SP3697 case
- Contacts: silver alloy (gold-plated silver alloy : on request)
- Terminals: brass (except W2/X : copper nickel), silver plated common
- Levers: stainless steel or polyamide, polyamide roller
- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 250 (PTI 600 on 831606 SP3697)
- Recommended min actuating speed: 0.1 mm/s

Product adaptations

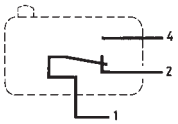
- Special levers: special shapes and lengths
- Special connections: angled, screw with clamp (W5), full wiring with custom connector….
- Telescopic plunger and adjustable fixing by threaded barrel: plastic version (153L accessory) or metal version (SP9603 or 83556, single or double pole)
- High operating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

Standard product | Product made to order | ● Contact us

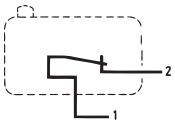
Principles

Single break snap-action switch

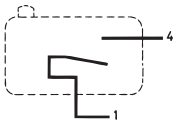
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)

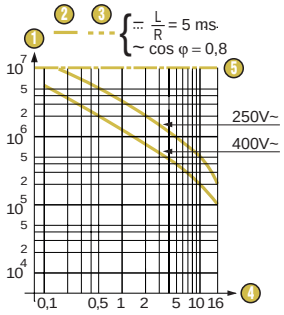


Normally open - SPST-NO (form A)



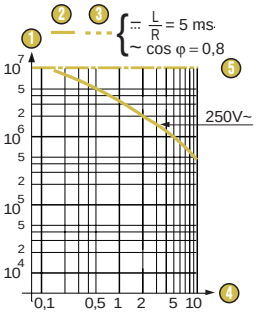
Curves

Operating curve for type 831600



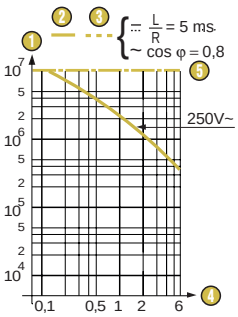
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Current in Amps
5. Mechanical life limit

Operating curve for type 831603



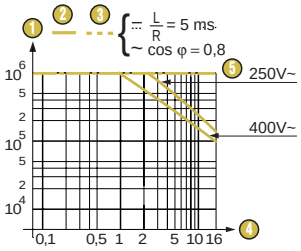
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Current in Amps
5. Mechanical life limit

Operating curve for type 831604



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

Operating curve for types 831606



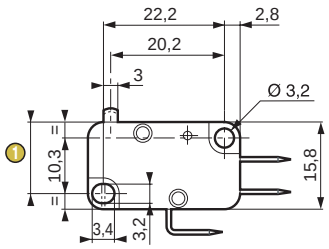
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Current in Amps
5. Mechanical life limit

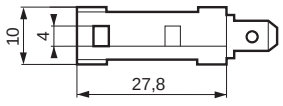
DC electrical life for 831606 SP 3697: 250 V⎓ 5 A resistif 300 000 cycles
250 V⎓ 1,5 A L/R 5 ms 30 000 cycles
250 V⎓ 0,5 A L/R 50 ms 50 000 cycles
125 V⎓ 3 A L/R 5 ms 30 000 cycles

Dimensions

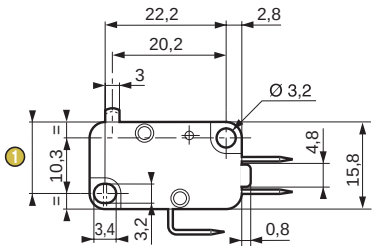
Product

831600 / 3 / 4 / 6





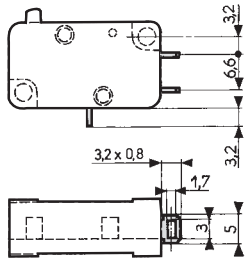
831606 SP 3697



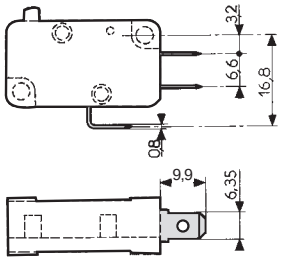
1. Total travel position = 13.2 max.

Connections

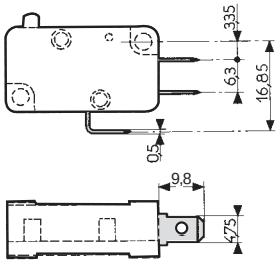
W2 solder



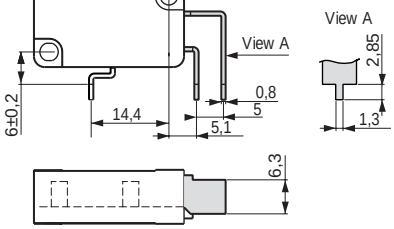
W3 quick-connect 6.3 x 0.8



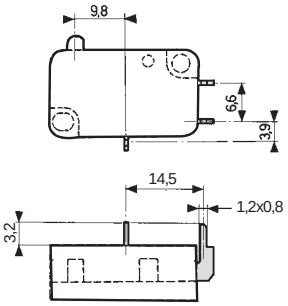
W6 quick-connect 4.8 x 0.5



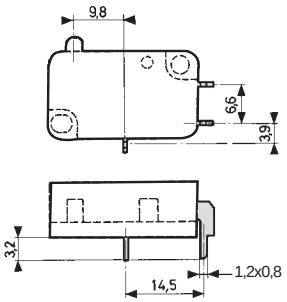
X1 for printed circuit board, straight output



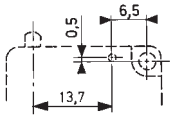
X2 for PCB, rear output



X3 for PCB, front output

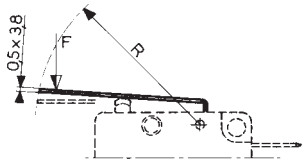


Actuator mounting positions

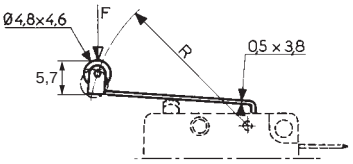


Actuators

153AX flat



153EX roller



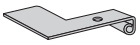
Other shapes and dimensions: consult us

Actuator and mounting accessories

Actuators		Flat **153AX** R29.7			Roller **153EX** R15.8			Roller **153 EX** R28.7		
										
		831600	**831603**	**831606**	**831600**	**831603**	**831606**	**831600**	**831603**	**831606**
Operating position	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
Pretravel - max.	mm	2.5	2.5	3.1	1.2	1.2	1.4	2.5	2.5	3.1
Differential travel max.	mm	0.6	0.8	1.5	0.3	0.4	0.7	0.6	0.8	1.5
Total travel max.	mm	2.3	2.3	2.3	2.3	2.3	2.3	4.6	4.6	4.6
We recommend that levers are assembled in our factories										

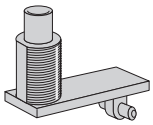
Actuators

Two-pole **153A2X** R15,9**

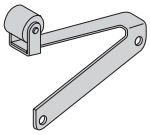


Dummy roller **153FX** R24.3**

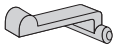
Telescopic plunger **153L****



Flexible with roller **153B****



Plastic **153 V****



** Please consult us

83160 microswitches with referenced actuators

	Actuator	153AX R29.7	153EX R15.8	153EX R28.7
831600	I W2	•	83160134	83160038
	I W3	83160067	83160029	83160065
	I W6	83160115	83160069	•
831603	I W2	83160345	•	•
	I W3	83160347	83160327	83160329
	I W6	•	•	•
831606	I W2	•	•	•
	I W3	•	83160669	83160674
831606 SP3697	I W2	•	83160681	•
	I W3	•	83160680	•

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch - Function - Connection - Actuator* - Adaptation*
* if needed
Example: 831600 I X1 153AX R29.7

Examples of special adaptations

Special lever and angled W3 terminals

Full wiring with custom connector

Customised version for nuclear application. Has radiation-resistant housing, 180 °C max operating temperature, W5 screw terminals and magnetic blowout for highly inductive circuit switching at 250 V⎓

Standard product | Product made to order | • Contact us

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

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

MINIATURE MICROSWITCHES - HEAVY DUTY

83160

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

Main specifications

Function	Connections	Standard 831600	Reduced force 831603	Low force 831604	Wide contact gap 831606	High DC rating 831606 SP 3697
I (changeover)	W2	83160005	83160320	83160420	83160602	83160664
I (changeover)	W3	83160006	83160301	83160401	83160601	83160679
I (changeover)	W6	83160045	83160321	83160415	●*	●*
I (changeover)	X1-X2	●	●	●	●*	●*
I (changeover)	X3	83160143	●	●	●*	●*
R (normally closed)	W2	83160001	●	●	●	●
R (normally closed)	W3	83160003	83160319	●	83160621	●
R (normally closed)	W6	●	●	●	●*	●*
R (normally closed)	X2-X3	●	●	●	●*	●*
C (normally open)	W2	83160002	83160324	●	83160603	●
C (normally open)	W3	83160004	83160316	83160402	83160622	●
C (normally open)	W6	83160047	●	●	●*	●*
C (normally open)	X2-X3	●	●	●	●*	●*
Electrical characteristics						
Rating nominal / 250 V AC (A)		16	10	6	16	16
Rating nominal / 250 V DC (A) **		0.5	0.5	0.4	0.8	5
Rating thermal / 250 V (A)		20	15	10	20	20
Rating NF / 250 V AC (A)		16(4)	10(4)	6(2)	16(4)	-
Rating UL / 125/250 V AC (A)		8	8	6	10	-
Mechanical characteristics						
Maximum operating force (N)		4	2	1	5	5
Min. Release force (N)		1.5	0.6	0.3	1	1
Maximum total travel force (N)		6.5	3	1.5	7	7
Max. Allowable overtravel force (N)		20	20	20	20	20
Rest position max. (mm)		15.6	15.6	15.6	15.7	15.7
Operating position (mm)		$14.8^{\pm 0.3}$	$14.8^{\pm 0.3}$	$14.7^{\pm 0.3}$	$14.6^{\pm 0.4}$	$14.6^{\pm 0.4}$
Maximum differential travel (mm)		0.3	0.4	0.35	0.7	0.7
Min. overtravel CRA (mm)		1.3	1.3	1.3	1	1
Ambient operating temperature (°C)		-40 → +125	-40 → +125	-40 → +125	-40 → +125	-40 → +125
Mechanical life (operations)		10^7	10^7	10^7	10^6	10^6
Contact gap (mm)		1.2	1.2	1.2	3.2	3.2
Weight (g)		6.7	6.7	6.7	6.7	6.7

* Please consult us ** with resistive load

Additional specifications

- Case, Button: PBT GF (UL 94-V0 / GWFI 960 °C)
  PA66 GF (GWFI 960 °C) - 831606 SP3697 case
- Contacts: silver alloy (gold-plated silver alloy : on request)
- Terminals: brass (except W2/X : copper nickel), silver plated common
- Levers: stainless steel or polyamide, polyamide roller
- Degree of protection: IP40 (mechanism)
- Proof tracking index: PTI 250 (PTI 600 on 831606 SP3697)
- Recommended min actuating speed: 0.1 mm/s

Product adaptations

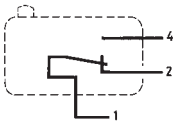
- Special levers: special shapes and lengths
- Special connections: angled, screw with clamp (W5), full wiring with custom connector….
- Telescopic plunger and adjustable fixing by threaded barrel: plastic version (153L accessory) or metal version (SP9603 or 83556, single or double pole)
- High operating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

Standard product | Product made to order | ● Contact us

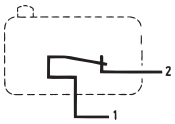
Principles

Single break snap-action switch

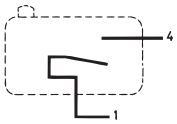
Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)

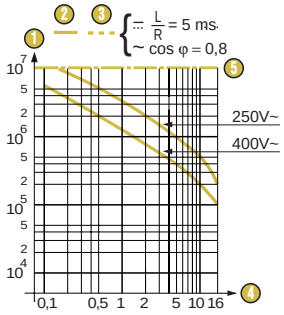


Normally open - SPST-NO (form A)



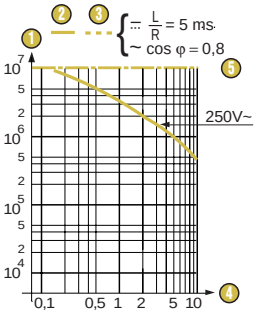
Curves

Operating curve for type 831600



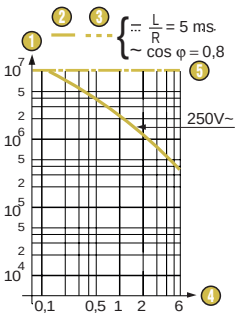
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Current in Amps
5. Mechanical life limit

Operating curve for type 831603



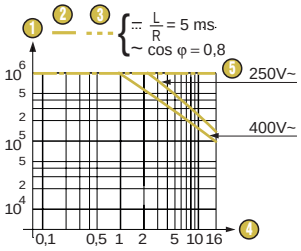
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Current in Amps
5. Mechanical life limit

Operating curve for type 831604



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

Operating curve for types 831606



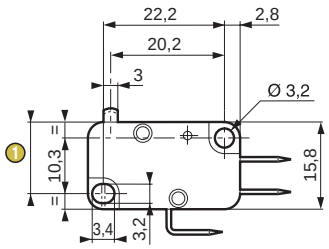
1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Current in Amps
5. Mechanical life limit

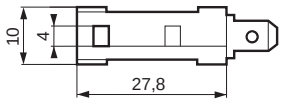
DC electrical life for 831606 SP 3697: 250 V⎓ 5 A resistif 300 000 cycles
250 V⎓ 1,5 A L/R 5 ms 30 000 cycles
250 V⎓ 0,5 A L/R 50 ms 50 000 cycles
125 V⎓ 3 A L/R 5 ms 30 000 cycles

Dimensions

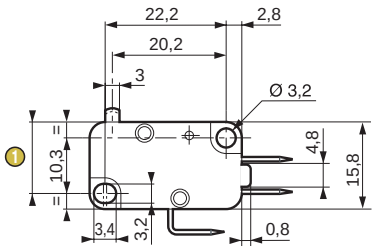
Product

831600 / 3 / 4 / 6





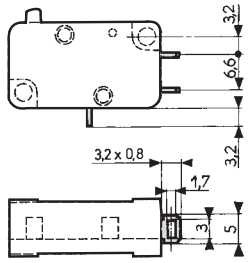
831606 SP 3697



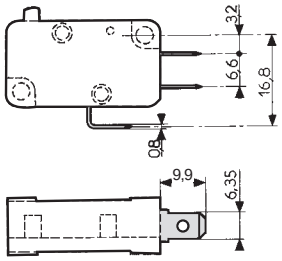
1. Total travel position = 13.2 max.

Connections

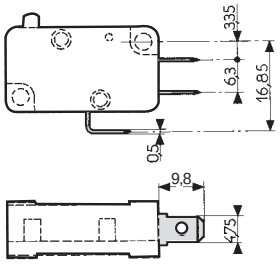
W2 solder



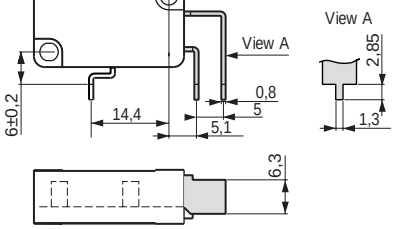
W3 quick-connect 6.3 x 0.8



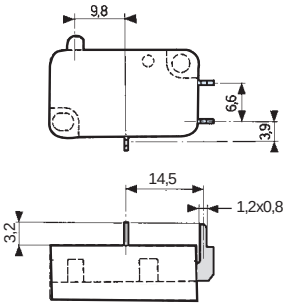
W6 quick-connect 4.8 x 0.5



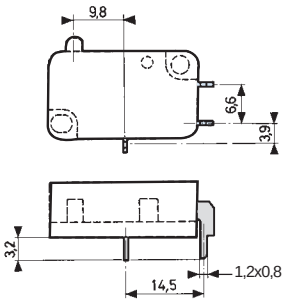
X1 for printed circuit board, straight output



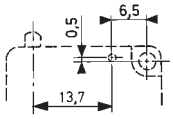
X2 for PCB, rear output



X3 for PCB, front output

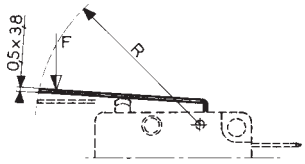


Actuator mounting positions

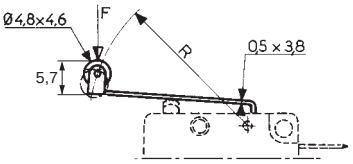


Actuators

153AX flat



153EX roller



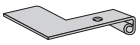
Other shapes and dimensions: consult us

Actuator and mounting accessories

Actuators		Flat **153AX** R29.7			Roller **153EX** R15.8			Roller **153 EX** R28.7		
										
		831600	**831603**	**831606**	**831600**	**831603**	**831606**	**831600**	**831603**	**831606**
Operating position	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
Pretravel - max.	mm	2.5	2.5	3.1	1.2	1.2	1.4	2.5	2.5	3.1
Differential travel max.	mm	0.6	0.8	1.5	0.3	0.4	0.7	0.6	0.8	1.5
Total travel max.	mm	2.3	2.3	2.3	2.3	2.3	2.3	4.6	4.6	4.6
We recommend that levers are assembled in our factories										

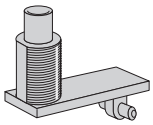
Actuators

Two-pole **153A2X** R15,9**

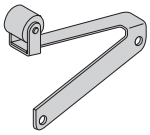


Dummy roller **153FX** R24.3**

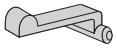
Telescopic plunger **153L****



Flexible with roller **153B****



Plastic **153 V****



** Please consult us

83160 microswitches with referenced actuators

	Actuator	153AX R29.7	153EX R15.8	153EX R28.7
831600	I W2	•	83160134	83160038
	I W3	83160067	83160029	83160065
	I W6	83160115	83160069	•
831603	I W2	83160345	•	•
	I W3	83160347	83160327	83160329
	I W6	•	•	•
831606	I W2	•	•	•
	I W3	•	83160669	83160674
831606 SP3697	I W2	•	83160681	•
	I W3	•	83160680	•

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch - Function - Connection - Actuator* - Adaptation*
* if needed
Example: 831600 I X1 153AX R29.7

Examples of special adaptations

Special lever and angled W3 terminals

Full wiring with custom connector

Customised version for nuclear application. Has radiation-resistant housing, 180 °C max operating temperature, W5 screw terminals and magnetic blowout for highly inductive circuit switching at 250 V⎓

Standard product | Product made to order | • Contact us

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

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

MINIATURE MICROSWITCHES - POSITIVE BREAK

831607

- **Coil spring snap-action mechanism with wiping contacts**
- **Positive opening action according to IEC 60947-5-1 Annex K**
- **Ratings from 10 mA 4 V⎓ to 6 A 250 V∿**
- **Very long life**
- **Extended range of terminals**
- **cURus approved**
- **Choice of actuators: stainless steel or plastic**

Main specifications

		Positive break 831607	
		Standard	Dual-current (DORE)
Function	**Connections**		
I (changeover)	W2	**83160702**	**83160796**
I (changeover)	W3	**83160704**	**83160786**
I (changeover)	W6A5	**83160706**	●
I (changeover)	X1	●	●
I (changeover)	X2	●	●
I (changeover)	X3	**83160708**	●
R (normally closed)	W2	**83160701**	**83160794**
R (normally closed)	W3	**83160703**	**83160797**
R (normally closed)	W6A5	**83160705**	●
R (normally closed)	X2	●	●
R (normally closed)	X3	**83160707**	●
Electrical characteristics			
Positive opening action		⊖	⊖
Rating nominal / 250 V∿ (A)		6	6*
Thermal current (Ith) A		10	10
Mechanical characteristics			
Maximum operating force (N)		4	
Min. Release force (N)		1.5	
Minimum positive opening force (N)		18	
Max. Allowable overtravel force (N)		200	
Rest position max. (mm)		15.7	
Operating position (mm)		$14.8^{\pm 0.3}$	
Positive opening position (mm)		13.5	
Maximum differential travel (mm)		0.3	
Min. overtravel (mm)		1.3	
Ambient operating temperature (°C)		-40 → +85	
Mechanical life (operations)		10^7	
Contact gap (mm)		1.2	
Weight (g)		7	

Additional specifications

- Case, Button: PBT GF (UL 94-V0 / GWFI 960 °C)
- Cover: PC (UL 94-V0 / GWFI 850 °C), transparent
- Contacts: silver alloy, gold-plated silver alloy (dual-current)
- Terminals: brass (except W2/X: copper nickel), silver plated common
- Levers: stainless steel or polyamide, polyamide roller
- Degree of protection: IP40 (mechanism)
- Recommended actuating speed: 0.1 mm/s to 0.5 m/s
- Rated insulation voltage Ui: 250 V
- Impulse withstand voltage Uimp: 4 kV

Product adaptations

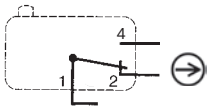
- **Special levers : special shapes and lengths**
- **Special connections : angled, screw with clamp (W5), full wiring with custom connector….**
- **Adjustable fixing by metal threaded barrel (SP9627)**
- **Variant for irradiated environment**

Standard product | Product made to order | ● Contact us

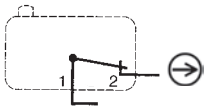
Principles

Single break snap-action switch with positive opening action on NC contacts (1-2) according to IEC 60947-5-1 Annex K

Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)



Curves

Electrical life

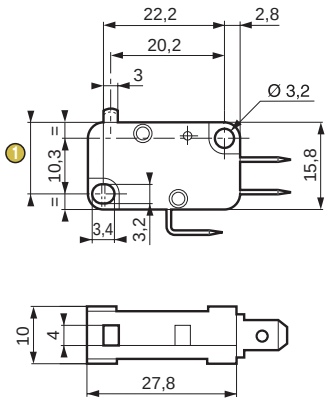
- Resistive load: 250 V~ 6 A: 10^5 cycles
- Inductive load (IEC 60947-5-1) : AC15: 250 V~ 6 A: 0.3 x 10^5 cycles
  DC13: 24 V⎓ 20 W L/R = 40 ms: 3 x 10^5 cycles
  120 V⎓ 20W L/R = 40 ms: 5 x 10^5 cycles

* Dual-current models are designed to operate equally well on low current (10 mA 4 V minimum recommended) 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

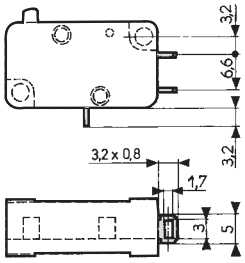
831607



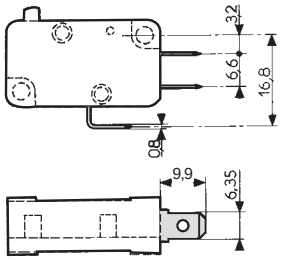
1 Total travel position = 13.2 max.

Connections

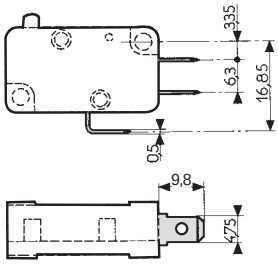
W2 solder



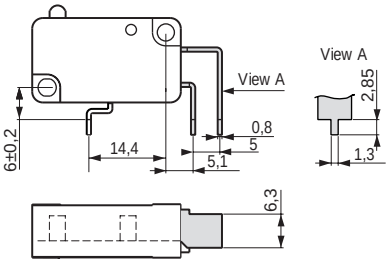
W3 quick-connect 6.3 x 0.8



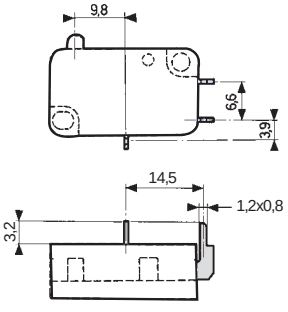
W6 quick-connect 4.8x0.5



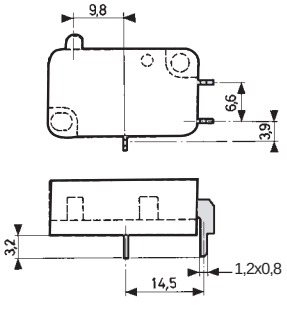
X1 for PCB, straight output



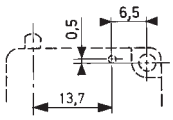
X2 for PCB, rear output



X3 for PCB, front output

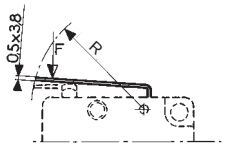


Actuator mounting positions

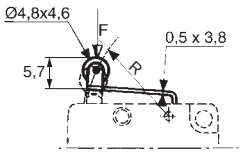


Actuators

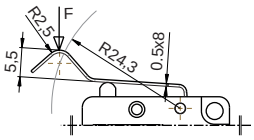
139AX flat



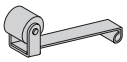
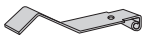
139EX roller

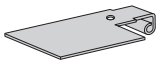
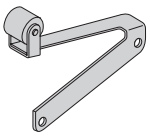
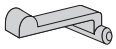


153FX dummy roller



Actuator and mounting accessories

Actuators		Flat **139AX** R16.2	Roller **139EX** R15.8	Dummy roller **153FX** R24.3
				
Operating force - max.	N	4	4	2.4
Release force - min.	N	1	1	0.9
Min. positive opening force	N	18	18	11
Maximum rest position	mm	16.2	21.3	21.8
Operating position	mm	15.3 ±0,3	20.5 ±0,45	20.3 ±0,6
Positive opening position	mm	14	19.2	18
Maximum total travel position	mm	13.9	19.1	17.6
We recommend that levers are assembled in our factories				

Actuators	Two-pole **139A2X** R 24**	Flexible with roller **153B****	Plastic **153V****
			

** Consult us

831607 microswitches with referenced actuators

	Actuator	139AX R16.2	139EX R15.8	153FX R24.3
831607 Standard	I W2	•	83160789	•
	I W3	•	83160710	•
	I X3	•	•	•
	R W2	•	83160787	•
	R W3	•	83160711	83160713
	R X3	•	83160714	•

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch - Function - Connection - Actuator* - Adaptation*
* if needed
Example: 831607 DORE R W3 139AX R16.2

Standard product | Product made to order | ● Contact us

Examples of special adaptations

Metal plunger and threaded barrel for heavy duty and precise setting (SP9627)

MINIATURE MICROSWITCHES - POSITIVE BREAK

832607

- Coil spring snap-action mechanism with wiping contacts
- Positive opening action according to IEC 60947-5-1 Annex K
- 6 A 250 V~ max rating
- Operating temperature -40 °C to 125 °C
- Very long life
- Extended range of terminals - Stainless steel actuators
- cURus and CCC approved

Main specifications

		Positive break 832607
Function	**Connections**	
I (changeover)	W2	**83260702**
I (changeover)	W3	**83260704**
I (changeover)	W6	**83260706**
I (changeover)	W5	●
I (changeover)	X1	**83260765**
I (changeover)	X2	**83260768**
I (changeover)	X3	**83260708**
R (normally closed)	W2	**83260701**
R (normally closed)	W3	**83260703**
R (normally closed)	W6	**83260705**
R (normally closed)	W5	●
R (normally closed)	X2	**83260732**
R (normally closed)	X3	**83260707**
Electrical characteristics		
Positive opening action		⊖
Rating nominal / 250 V~ (A)		6
Thermal current (Ith) A		10
Mechanical characteristics		
Maximum operating force (N)		4
Min. Release force (N)		1.5
Minimum positive opening force (N)		18
Max. Allowable overtravel force (N)		200
Rest position max. (mm)		15.7
Operating position (mm)		$14.8^{\pm 0.3}$
Positive opening position (mm)		13.5
Maximum differential travel (mm)		0.3
Min. overtravel (mm)		1.3
Ambient operating temperature (°C)		-40 → +125
Mechanical life (operations)		10^7
Contact gap (mm)		1.2
Weight (g)		7

Additional specifications

- Case: PET GF (UL 94-V0 / GWFI 960 °C / GWIT 775 °C)
- Button: PA66 GF (UL 94-V0 / GWFI 960 °C)
- Contacts: silver alloy
- Terminals: brass (except W2/X: copper nickel), silver plated common
- Levers: stainless steel, polyamide roller
- Degree of protection: IP40 (mechanism)
- Recommended actuating speed: 0.25 mm/s to 0.5 m/s
- Rated insulation voltage Ui: 250 V
- Impulse withstand voltage Uimp: 4 kV

Product adaptations

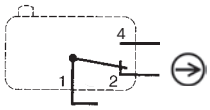
- Special levers: special shapes and lengths
- Lever mounted on position A for higher ratio
- Special connections: angled, full wiring with custom connector….

Standard product | Product made to order | ● Contact us

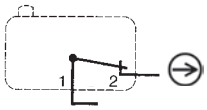
Principles

Single break snap-action switch with positive opening action on NC contacts (1-2) according to IEC 60947-5-1 Annex K

Changeover - SPDT (form C)



Normally closed - SPST-NC (form B)



Curves

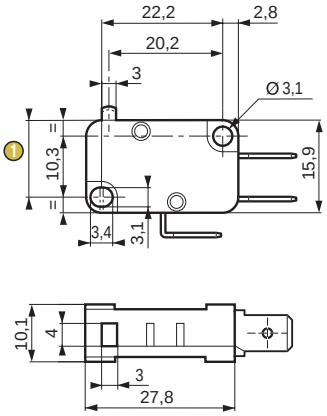
Electrical life

- Resistive load: 250 V~ 6 A: 10^5 cycles
- Inductive load (IEC 60947-5-1) : AC15: 250 V~ 6 A: 0.3 x 10^5 cycles
  DC13: 24 V⎓ 20 W L/R = 40 ms: 3 x 10^5 cycles
  120 V⎓ 20W L/R = 40 ms: 5 x 10^5 cycles

Dimensions

Product

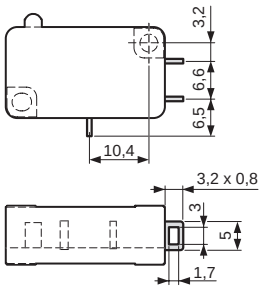
832607



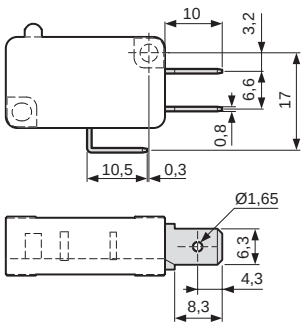
1 Total travel position = 13.2 max.

Connections

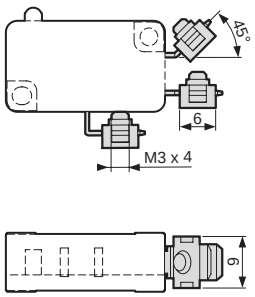
W2 solder



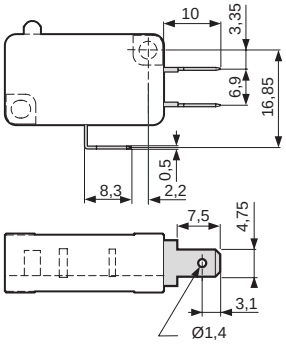
W3 quick-connect 6.3 x 0.8



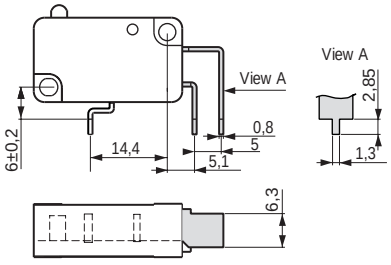
W5 screw with clamp



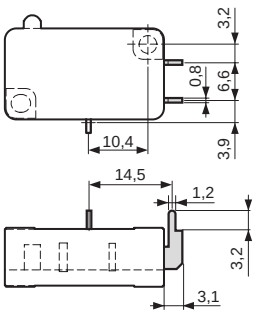
W6 quick-connect 4.8x0.5



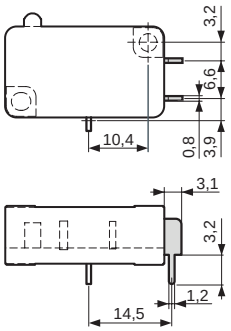
X1 for PCB, straight output



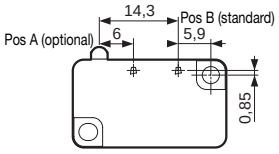
X2 for PCB, rear output



X3 for PCB, front output

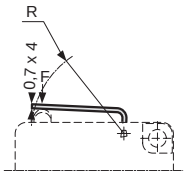


Actuator mounting positions

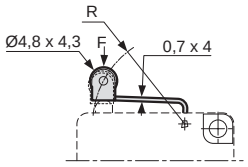


Actuators

260A flat

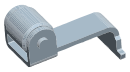


260E roller



Other shapes and dimensions: consult us

Actuator and mounting accessories

Actuators		Flat **260A** R16.8	Roller **260E** R16
			
Operating force - max.	N	4	4
Release force - min.	N	1	1
Min. positive opening force	N	18	18
Maximum rest position	mm	16.4	21.5
Operating position	mm	15.5 $^{\pm 0,3}$	20.6 $^{\pm 0,45}$
Positive opening position	mm	14.2	19.3
Maximum total travel position	mm	14.1	19.2
Levers are assembled in our factories			

832607 microswitches with referenced actuators

	Actuator	260A R16.8 Pos B	206E R16 Pos B
832607	I W2	•	83260735
	I W3	•	83260710
	I W5	•	83260764
	I X3	•	83260736
	R W2	•	83260734
	R W3	•	83260711
	R W5	•	•
	R X3	•	83260714

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch - Function - Connection - Actuator* - Fixing position*
* if needed
Example: 832607 R W2 260A R16.8 B

Standard product | Product made to order | • Contact us

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.

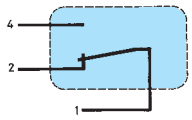
Product adaptations

- Special levers
- UL approval

To order, see page 12

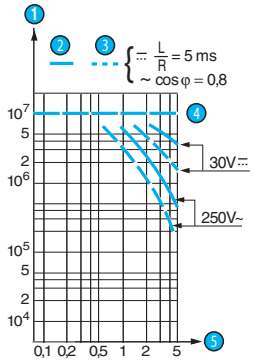
Principles

Single break changeover switch



Curves

Operating curve for type 83 137 0

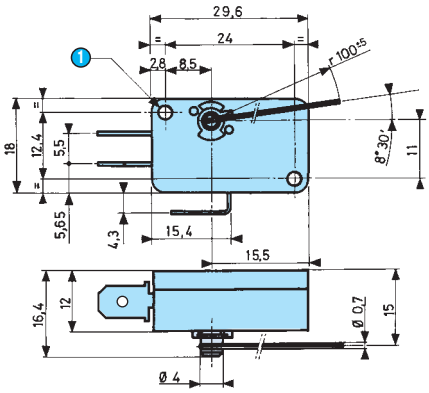


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

➜ Product

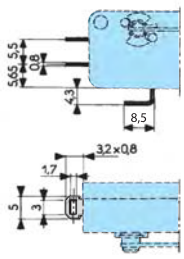
83 137 0



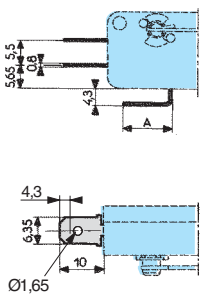
1. 2 holes Ø 3.2

➜ Connections

W2 solder



W3 for 6.35 mm clips



Other information

Mounting - Operation
See basic technical concepts

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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

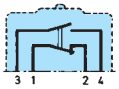
Product adaptations

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

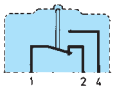
To order, see page 12

Principles

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

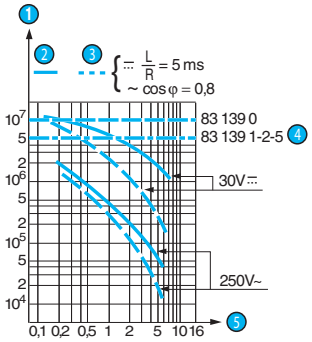


Single break changeover switch
Type 83 139 2



Curves

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

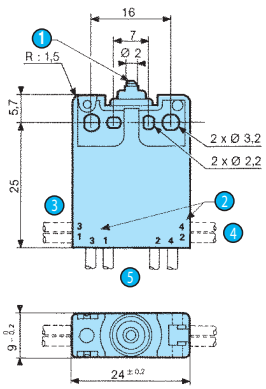


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

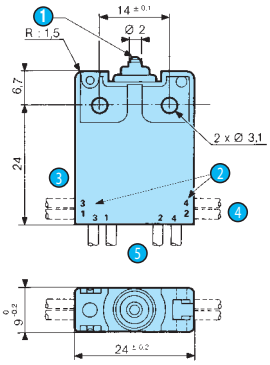
➜ Product

83 139 0 - 5
A fixing = 4 holes



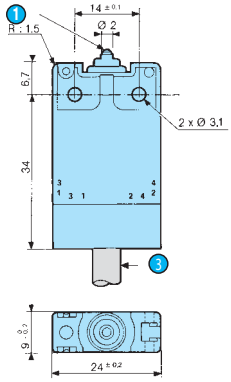
1. R : 1.5 spherical
2. Lead reference on casing
3. Lead output on left
4. Lead output on right
5. Standard lead output (black)
   1 = black lead
   2 = brown lead
   3 = grey lead
   4 = blue lead

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

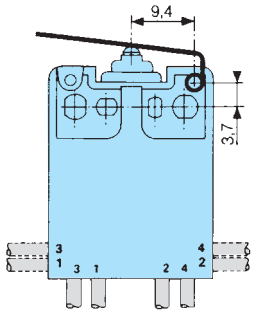
83 139 2
B fixing = 2 holes



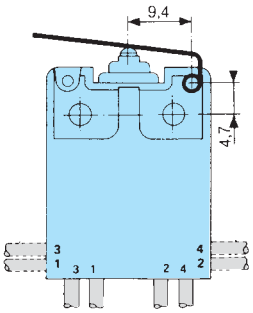
1. R : 1.5 spherical
3. Cable 3 x 0.75 mm² length 0.50 m
   1 = black lead
   2 = brown lead
   3 = blue lead

➜ Actuator mounting positions

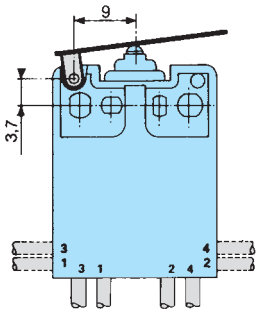
Type 139
A fixing = 4 holes



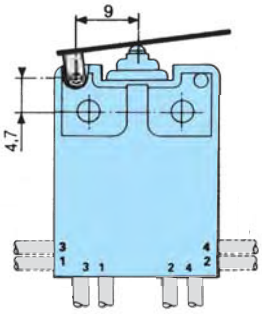
Type 139
B fixing = 2 holes



Type 161
A fixing = 4 holes

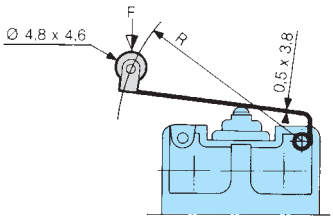


Type 161
B fixing = 2 holes

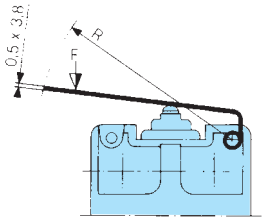


➜ Actuators

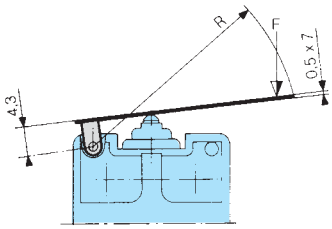
139 EX



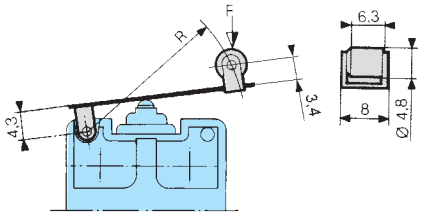
139 AX



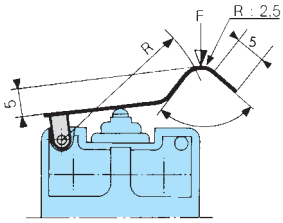
161 A



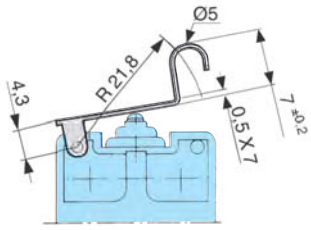
161 E



161 F



161 G



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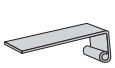
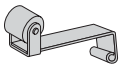
Actuators and fixing positions

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)
Ⓔx II 2 G
EEx d IIC T6

Key to these symbols :
Ⓔx - 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

Protected

➜ 83 106

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

Main specifications

Function	Connections	Standard 83 106 0	2 stable lever positions 83 106 4	2 stable plunger positions 83 106 7
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)		$11.45^{\pm0.2\ -0.25}$	-	-
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)		$0.5^{\pm0.2}$	-	-
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

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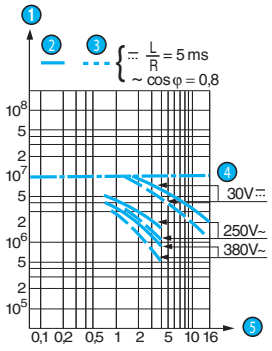
Principles

Double break changeover switch

Curves

Operating curve for types 83 106 0 / 4 / 7

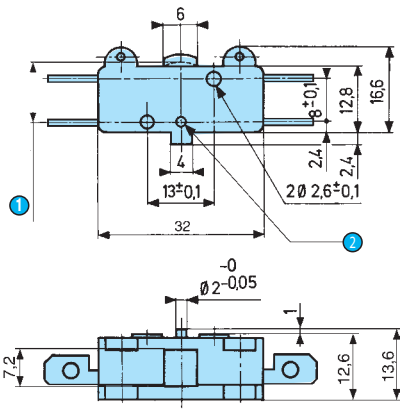


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

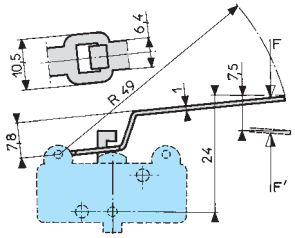
➜ Product

83 106

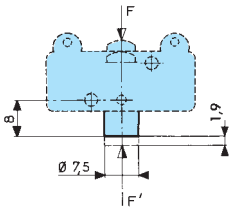


1. OL = 10.65
2. Ø $2^{+0.01}_{+0.65}$ Depth 1.2

83 106 4

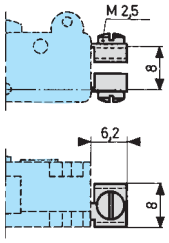


83 106 7

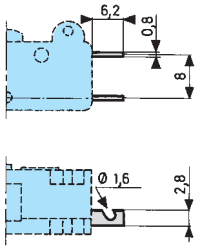


➜ Connections

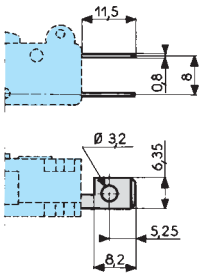
W1 screw



W2 solder

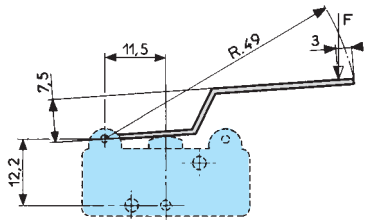


W3 for 6.35 mm clips



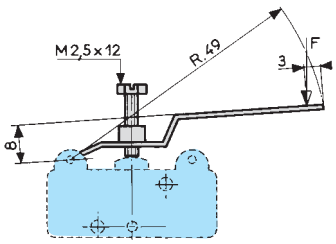
➜ Actuators

A



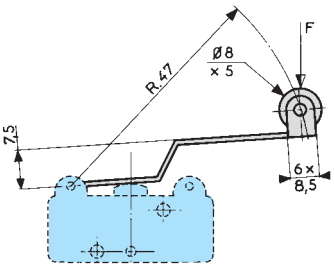
Lever cross-section 1 x 6.4 mm

B



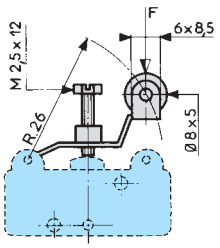
Lever cross-section 1 x 6.4 mm

E



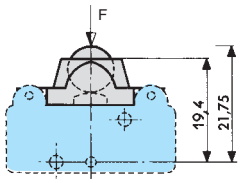
Lever cross-section 1 x 6.4 mm

Q

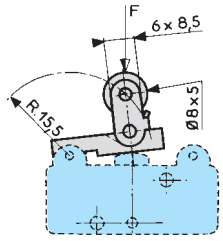


Lever cross-section 1 x 6.4 mm

B9



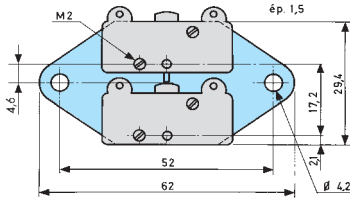
V3



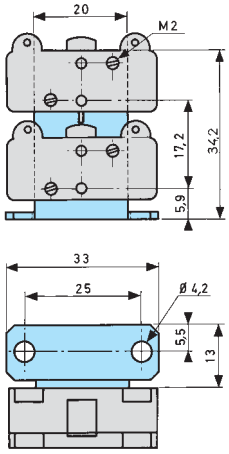
Lever cross-section 1 x 6.4 mm

➜ Mounting accessories

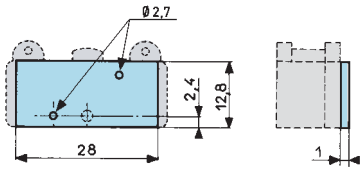
O2
2-pole side mounting plate



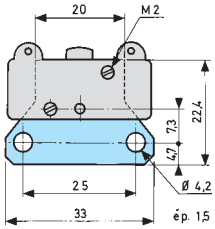
K2
2-pole vertical mounting plate



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 ±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

➜ 83 109

- 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

1

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

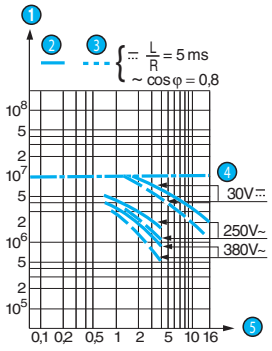
To order, see page 12

Principles

Double break changeover switch

Curves

Operating curve for type 83 109 0

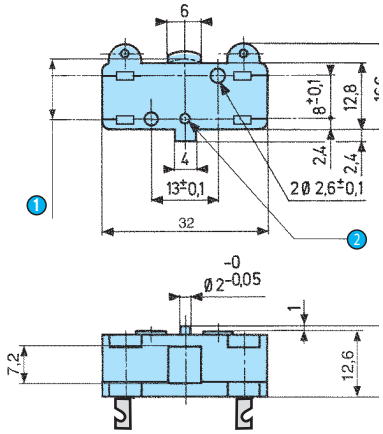


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

➜ Product

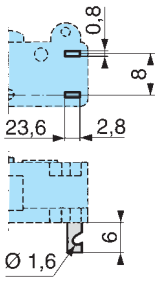
83 109 0



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

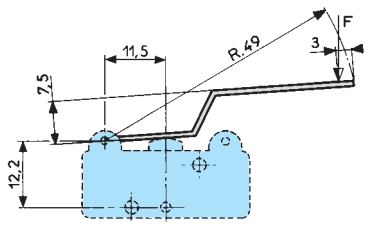
➜ Connections

W2 solder



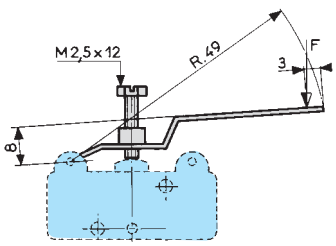
➜ Actuators

A



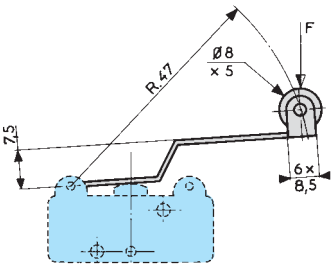
Lever cross-section 1 x 6.4 mm

B



Lever cross-section 1 x 6.4 mm

E



Lever cross-section 1 x 6.4 mm

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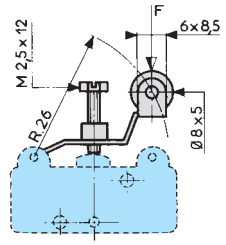
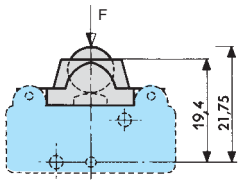
Q

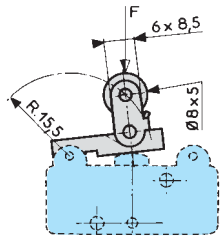


Lever cross-section 1 x 6.4 mm

B9



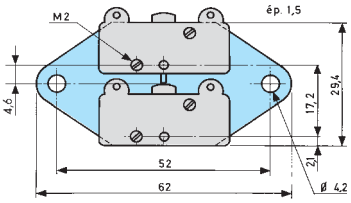
V3



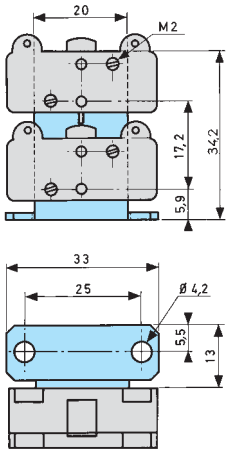
Lever cross-section 1 x 6.4 mm

➜ Mounting accessories

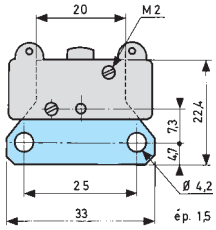
O2
2-pole side mounting plate



K2
2-pole vertical mounting plate



H
Horizontal single-pole mounting plate



Unless indicated, the thickness of plates is 1.5 mm

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 ±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

➜ 83 111

- 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

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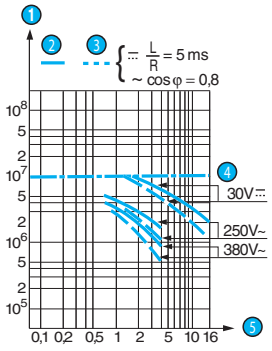
Principles

Double break changeover switch

Curves

Operating curve for types 83 111 0 - 83 111 5

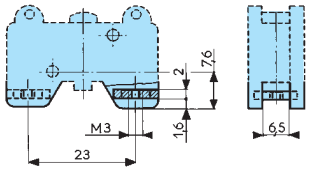


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

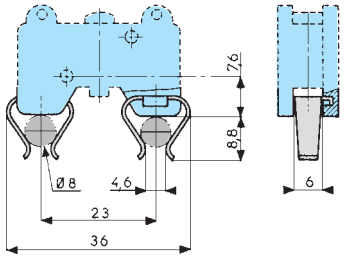
Dimensions

➜ Product

83 111 0

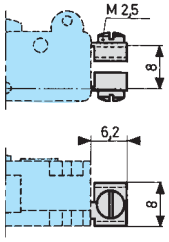


83 111 5

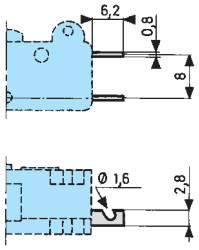


➜ Connections

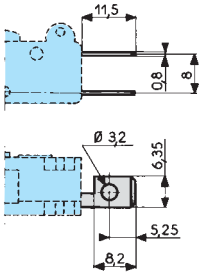
W1 screw



W2 solder



W3 for 6.35 mm clips



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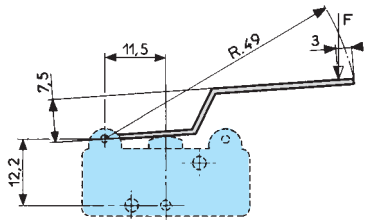
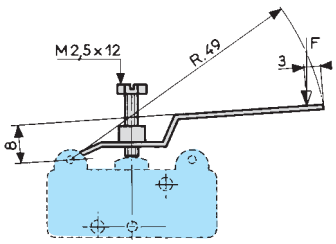
➜ Actuators

A



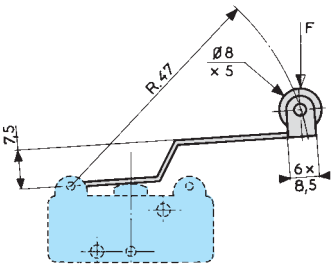
Lever cross-section 1 x 6.4 mm

B



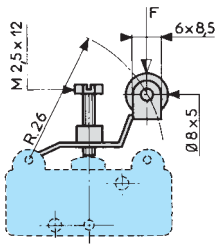
Lever cross-section 1 x 6.4 mm

E



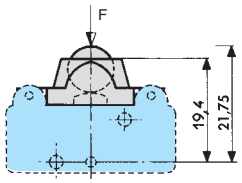
Lever cross-section 1 x 6.4 mm

Q

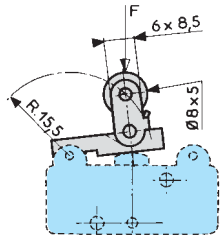


Lever cross-section 1 x 6.4 mm

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 ±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)..

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)		$0.5^{\pm0.2}$
Ambient operating temperature (°C)		-40 → +85
Contact gap (mm)		0.4 x 2
Weight (g)		14.5

1

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**

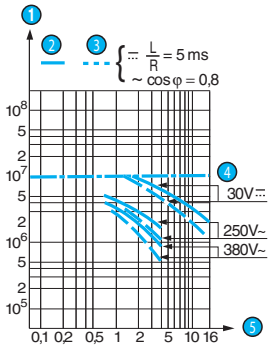
To order, see page 12

Principles

Double break changeover switch

Curves

Operating curve for type 83 112 0

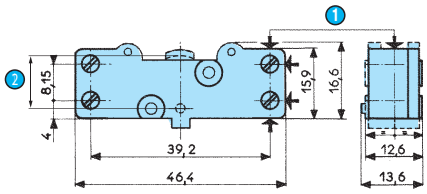


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

➜ Product

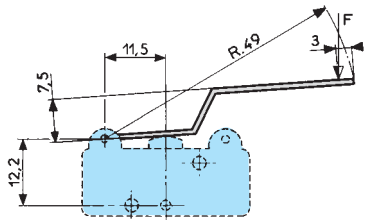
83 112 0



1. Connection
2. OL = 10.65

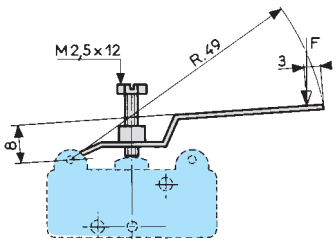
➜ Actuators

A



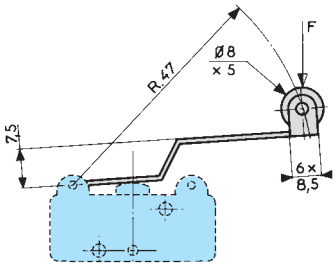
Lever cross-section 1 x 6.4 mm

B



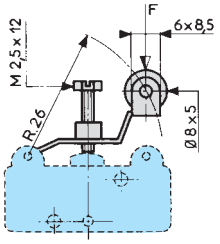
Lever cross-section 1 x 6.4 mm

E



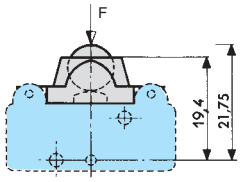
Lever cross-section 1 x 6.4 mm

Q

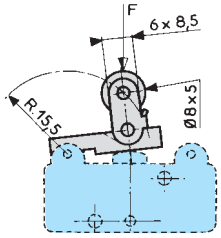


Lever cross-section 1 x 6.4 mm

B9



V3



Lever cross-section 1 x 6.4 mm

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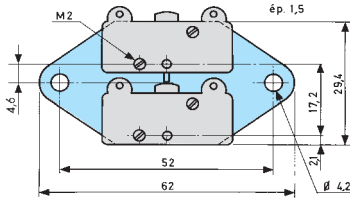
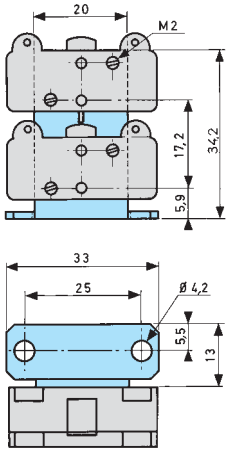
➜ Mounting accessories

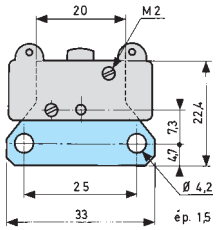
O2
2-pole side mounting plate



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

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Protected

➜ 83 118

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

Main specifications

Function	Connections	Standard 83 118 0	Reduced force 83 118 S1
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

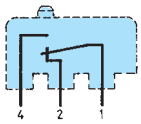
Product adaptations

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

To order, see page 12

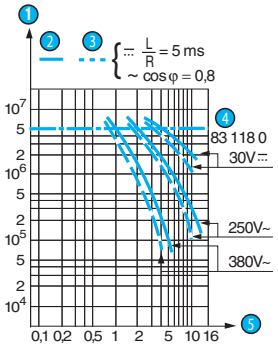
Principles

Single break changeover switch



Curves

Operating curve for types 83 118 0 - 83 118 S1

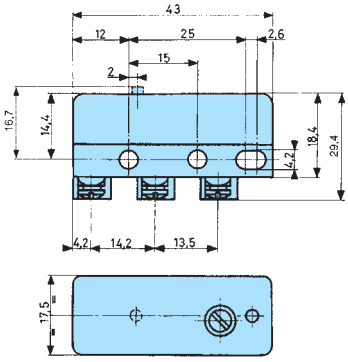


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

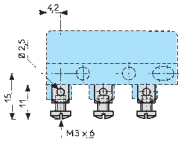
➜ Product

83 118 0/83 118 S1

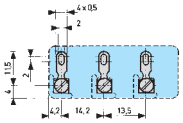


➜ Connections

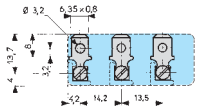
W1 screw



W2 solder

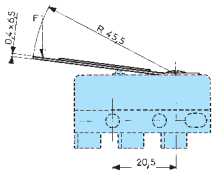


W3 for 6.35 mm clips

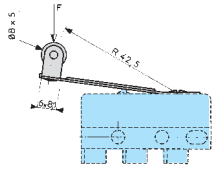


➜ Actuators

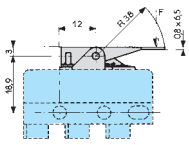
52A



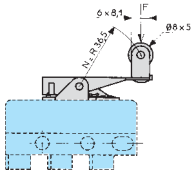
52B



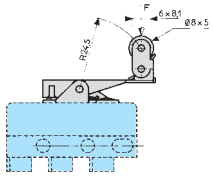
52M



52N

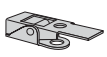
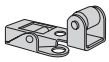
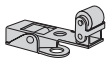
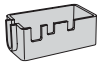


52V



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

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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)

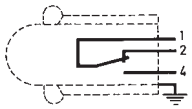
Product adaptations

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

To order, see page 12

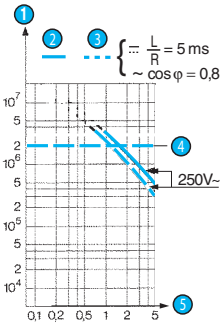
Principles

Double break changeover switch



Curves

Operating curve

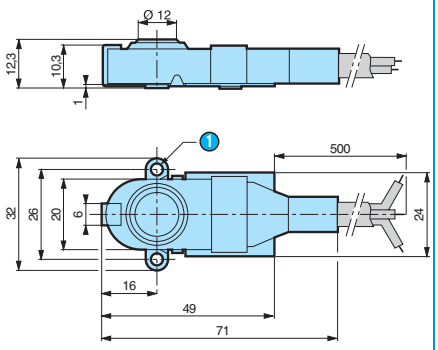


1. Number of cycles
2. Resistive circuit
3. Inductive circuit
4. Mechanical life limit
5. Current in Amps

Dimensions

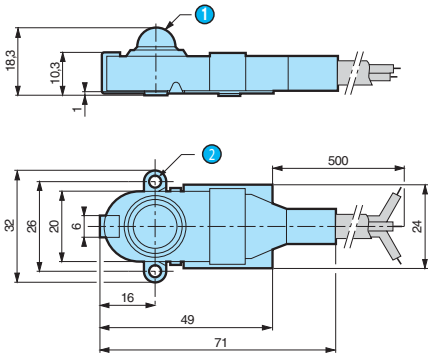
➜ Product

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.

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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

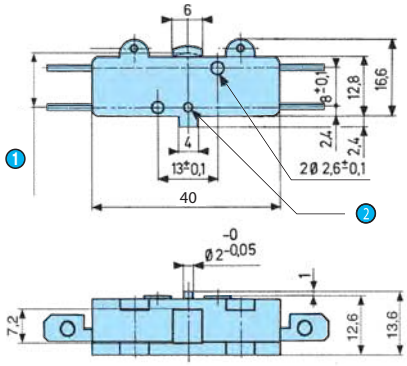
Principles

Single break changeover switch

Dimensions

➜ Product

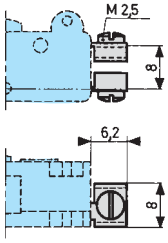
83 154 0



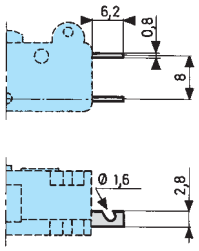
1 OL = 10.65
2 Ø $2^{+0.01}$ $^{+0.65}$ Depth 1.2

➜ Connections

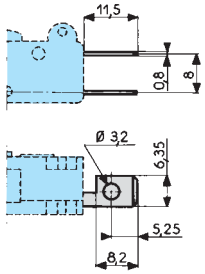
W1 screw



W2 solder

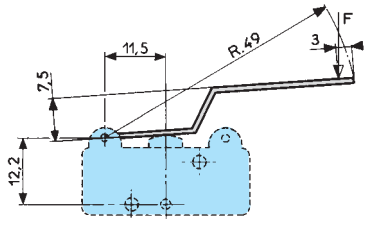


W3 for 6.35 mm clips



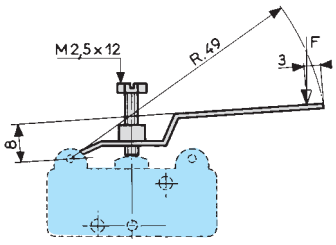
➜ Actuators

A



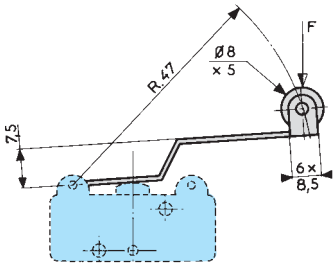
Lever cross-section 1 x 6.4 mm

B



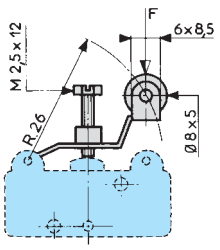
Lever cross-section 1 x 6.4 mm

E



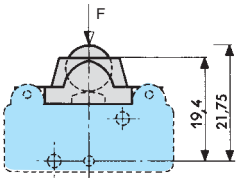
Lever cross-section 1 x 6.4 mm

Q

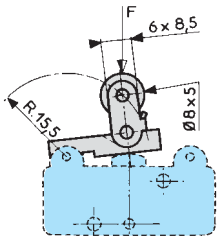


Lever cross-section 1 x 6.4 mm

B9



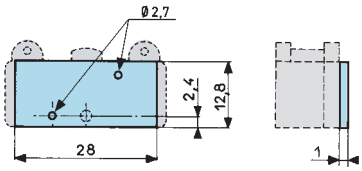
V3



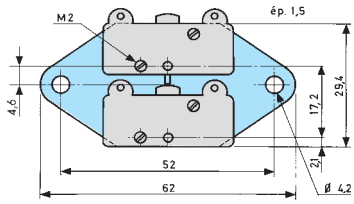
Lever cross-section 1 x 6.4 mm

➜ Mounting accessories

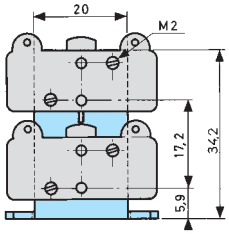
Y
Side plate

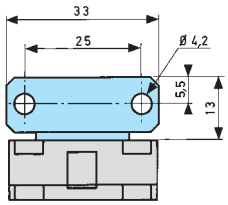


O2
2-pole side mounting plate

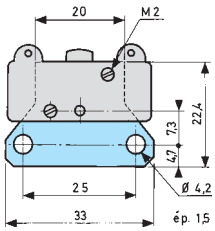


K2
2-pole vertical mounting plate





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

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MICROSWITCHES - SEALED, POSITIVE BREAK

PBX - 8324

- **Double-break snap-action mechanism with electrically separated circuits (form Zb)**
- **Positive opening action according to IEC 60947-5-1 Annex K**
- **Long overtravel, also after the positive opening position**
- **Protection of mechanism: IP67/IP65, or IP40 with sealed plunger**
- **Operating temperature -50 °C to +85 °C**
- **Ratings from 1 mA 4 V⎓ to 6 A 250 V∿ - Rating codes: A300, Q150**
- **Very long mechanical life**
- **Choice of connections - Mounting plates and roller lever (pre-assembled or retrofittable)**
- **cURus and CCC approved - Meet applicable railway standards**

Main specifications

Degree of protection	Connections	Standard 83240	High force 83242	Dual-current 83244	Dual-current High force 83245
IP40	W3	**83240000**	**83242000**	**83244000**	**83245000**
IP40	W3/90B	**83240010**	**83242010**	●	●
IP40	W5	**83240020**	**83242020**	**83244020**	**83245020**
IP40	W5/IP20	**83240030**	**83242030**	**83244030**	**83245030**
IP40	W1	●	●	●	●
IP67	W3	**83240200**	**83242200**	**83244200**	**83245200**
IP67	W3/90B	**83240210**	●	**83244210**	●
IP67	W5	**83240220**	**83242220**	**83244220**	**83245220**
IP67	W5/IP20	**83240230**	**83242230**	**83244230**	**83245230**
IP 67	W1	●	●	●	●
Electrical characteristics					
Positive opening action		⊖	⊖	⊖	⊖
Rating nominal / 250 V∿ (A)		6	6	6*	6*
Rating nominal / 250 V⎓ (A)		0.6	0.6	0.6*	0.6*
Rating Thermal (A)		10	10	10	10
Mechanical characteristics					
Maximum operating force (N)		4.5	6.5	4.5	6.5
Minimum release force (N)		0.6	2.5	0.6	2.5
Minimum positive opening force (N)		28	28	28	28
Maximum rest position (mm)		8.9	8.9	8.9	8.9
Operating position (mm)		6.6 $^{\pm 0.25}$	6.6 $^{\pm 0.25}$	6.6 $^{\pm 0.25}$	6.6 $^{\pm 0.25}$
Positive opening position (mm)		4.4	4.4	4.4	4.4
Maximum total travel position (mm)		3.4	3.4	3.4	3.4
Differential travel (mm)		1 $^{\pm 0.3}$	1 $^{\pm 0.3}$	1 $^{\pm 0.3}$	1 $^{\pm 0.3}$
Operating temperature (°C)		-50 → +85	-50 → +85	-50 → +85	-50 → +85
Mechanical life - IP40 versions (operations)		10^7	10^7	10^7	10^7
Mechanical life - IP67 versions (operations)		$4x10^6$	$4 x 10^6$	$4 x 10^6$	$4 x 10^6$
Contact gap (mm)		2 x 1	2 x 1	2 x 1	2 x 1
Weight (g)		22	22	22	22

Additional characteristics

- Case: PC GF (UL 94-V2 / GWFI 960 °C / GWIT 775 °C)
- Button: PBT GF (UL 94-V0 / GWFI 960 °C)
- Membrane: silicone rubber
- Contacts: silver alloy, micro-profile
  gold alloy on silver alloy, micro-profile (dual-current)
- Terminals: brass (silver-plated brass : on request)
- Screws: stainless steel
- Levers: stainless steel, polyamide roller
- Degree of protection: IP65/IP67 or IP40 (mechanism)
- Recommended min actuating speed: 0.5 mm/s
- Rated insulation voltage Ui: 400 V
- Impulse withstand voltage Uimp: 4 kV
- Pollution degree: 3
- Protection against electric shock: Button and actuators of IP67 versions have reinforced insulation
- Dimensional conformity: DIN 41636 F
- Fire/smoke resistance: EN 45545, NFF 16101/102-I3F1
- Approvals: cURus (A300, Q150), CCC

Product adaptations

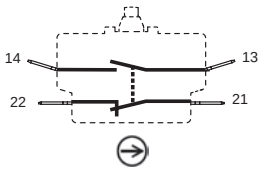
- **IP67 wire lead or cable outputs, EN 50306 halogen-free versions**
- **Special connections: W3 QC tabs with specific folding angles, double QC tabs, W5 without screws, …**
- **Special levers: special shapes and lengths**
- **AgPd contacts for infrequent switching in corrosive atmospheres up to 1A (83241/83243)**
- **Maintained action variant (bistable reset switch), with plunger or lever**
- **Two-pole DPDT assemblies with common lever**
- **IP40 protective cover/housing on connections**

Standard product | Product made to order | ● Contact us

Principles

Double break snap-action switch with electrically separated circuits and with positive opening action on NC contacts (21-22) according to IEC 60947-5-1 Annex K

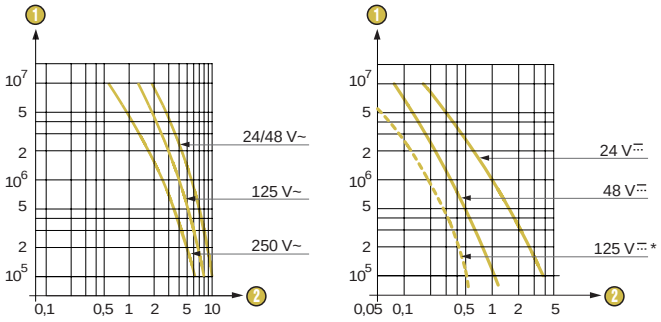
Changeover - SPDT (form Zb)



Both circuits can be used at opposite polarities

Curves

Operating curve for category AC15 **Operating curve for category DC13**



1 Number of operations
2 Current in Amps

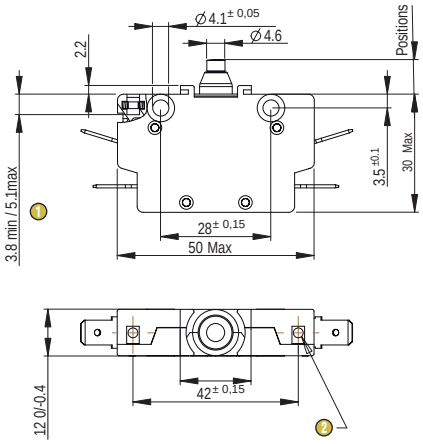
For IP67 versions used in 125 V DC, please consult us.

* Models 83244 and 83245 are designed to operate equally well on low-current (1 mA 4 V minimum recommended) or medium to high current circuits. However, a given product should only be used to switch one type of circuit during its working life.

Dimensions (mm)

Product

8324

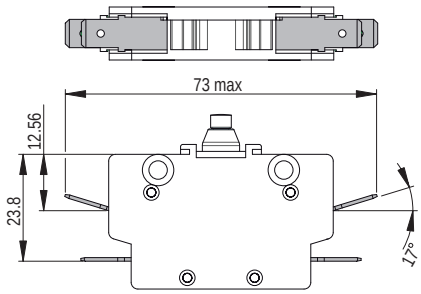


1 Fixing screw threaded length
2 Fixing nuts 2 x M3

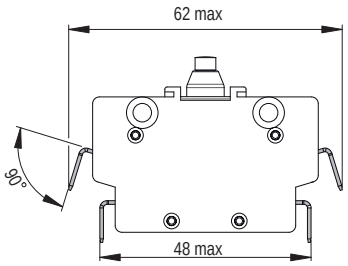
Max. tightening torque of fixing screws: 1.3 N.m on ∅ 4.1 holes
0.9 N.m on M3 nuts

Connections

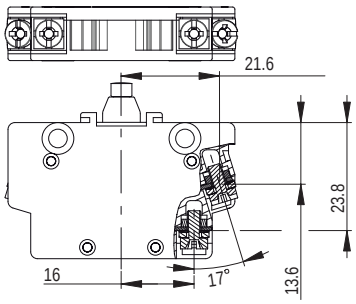
W3 quick-connect 6.3 x 0.8



W3/90B quick-connect 6.3x0.8, 90° downward folding

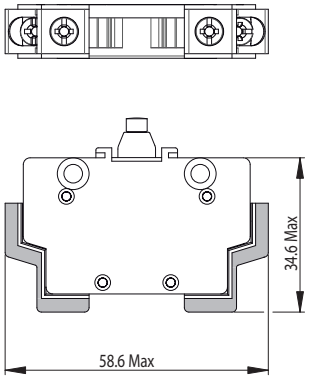


W5 screw with clamp
W1 screw with washer



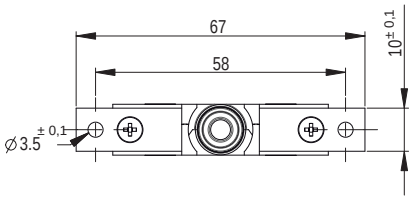
4 x M3 screws - PZ1 type

W5/IP20 screw with clamp and IP20 protection



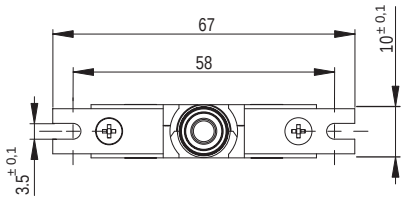
Mounting accessories

PT mounting plates with holes



Thickness: 1 mm

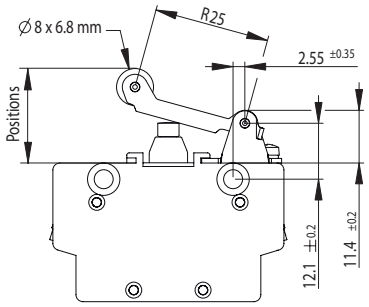
PE mounting plates with notches



Thickness: 1 mm

Actuators

LG roller lever



Mechanical characteristics on roller

	83240/83244	83242/83245
Maximum operating force (N)	3	4
Minimum release force (N)	0.3	1.3
Min. positive opening force (N)	19	19
Maximum rest position (mm)	21	21
Operating position (mm)	$16{,}6^{\pm 0{,}5}$	$16{,}6^{\pm 0{,}5}$
Positive opening position (mm)	13,2	13,2
Maximum total travel position (mm)	12	12
Differential travel (mm)	$1{,}8^{\pm 0{,}55}$	$1{,}8^{\pm 0{,}55}$

Actuators and mounting accessories

***PBX* 8324 with referenced accessories**

		Roller lever Mounting plates Accessory kit	LG - 79552456	LG PT 79552457	LG PE 79552458	- PT 79552459	- PE 79552460
83240	IP40	W3	83240003	83240004	83240005	•	•
		W3/90B	83240013	83240014	83240015	•	•
		W5	83240023	83240024	•	•	•
		W5/IP20	83240033	83240034	•	•	•
	IP67	W3	83240203	•	•	•	•
		W3/90B	83240213	•	•	•	•
		W5	83240223	83240224	83240225	83240221	•
		W5/IP20	•	•	•	•	•
83242	IP40	W3	83242003	83242004	83242005	•	•
		W3/90B	•	83242014	•	83242011	•
		W5	83242023	83242024	•	•	•
		W5/IP20	•	•	•	•	•
	IP67	W3	•	•	•	•	•
		W3/90B	•	•	•	•	•
		W5	83242223	83242224	•	•	•
		W5/IP20	•	•	•	•	•
83244	IP40	W3	83244003	83244004	•	•	•
		W3/90B	83244013	83244014	•	•	•
		W5	83244023	83244024	•	•	•
		W5/IP20	•	83244034	•	•	•
	IP67	W3	83244203	•	•	•	•
		W3/90B	83244213	•	•	•	•
		W5	83244223	•	•	•	•
		W5/IP20		•	•	•	•

Installation recommendations

See “Basic technical concepts”

How to order

Use the 8 digit part numbers when they are defined

Other cases, precise: Type of microswitch - Degree of protection - Connection - Actuator* - Mounting accessories* - Adaptation*
* if needed
Example: 83240 IP67 W3/90B LG PE

Examples of special adaptations

Two-pole DPDT assembly with linked levers

Short roller lever

Mixed connections: NO quick-connect 6.3 x 0.8 / NC screw with clamp

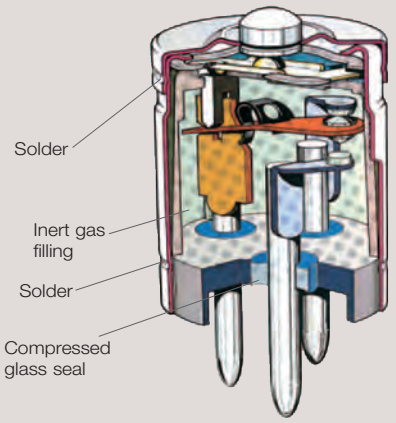
Mixed connections: NO screw with clamp / NC quick-connect 6.3 x 0.8, 90°downward folding

Economic version (839930): SPDT form Za without positive opening, Ø 3.2 mounting holes on top face, screw terminals

Standard product | Product made to order | ● Contact us

HERMETICALLY SEALED MICROSWITCH TYPES 83 151 (-55 °C TO 150 °C)

BASIC CELL



This is the basic component for our whole range of standard 1-pole and 2-poles hermetically-sealed limit switches plus the 3-poles version (special Limit Switches).

The Crouzet Aerospace hermetic microswitch combines a snap-action switching system with high resistance to shock and vibration in an hermetically sealed miniature case which encloses an atmosphere of inert gas around its contacts, ideal for switching very low level circuits and higher currents also.

The meticulous care taken in the manufacture of this hermetically sealed cell in terms of assembly processes, cleanliness of components as well as inspection procedures, result in a product which is ideal for operation in severe environments where a high level of reliability is essential.

The Crouzet Aerospace hermetically sealed cell is particularly well suited to sectors such as Aerospace, Armaments, Marine, Nuclear, etc.

ESSENTIAL CHARACTERISTICS

› Switching power from 1 mA to 7 A.

› Operating temperature: -55 °C to +150 °C (Type 83 151 2: -55 °C to +250 °C).

› Vibration resistant up to 80 G.

› Shock resistant up to 200 G.

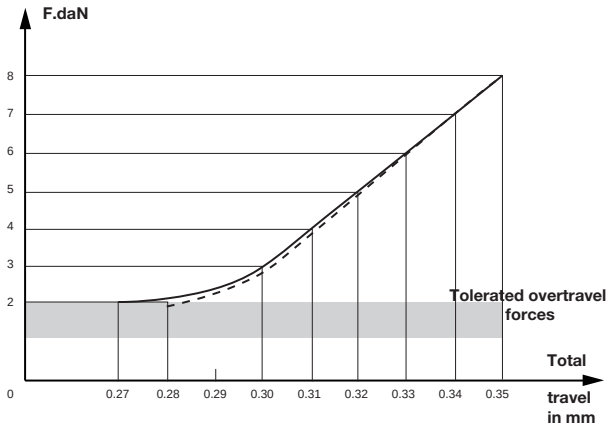
› High level of hermetic sealing: Leakage $< 1 \times 10^{-6}$ cm^3 He / s

› Long life: 200 000 cycles.

› Small size: ø 11 x 16.

› Numerous single pole and multipoles operating and fixing options.

DISTINCTIVE CHARACTERISTICS



Mechanical strength

There is no sudden increase in the total travel of the detector when overtravel forces rising to as much as 80 N are applied. If, after doing this, the overtravel force is altered back to its normal level of 20 N with the same detector, only a very slight change will be apparent in the total travel (low remanence).

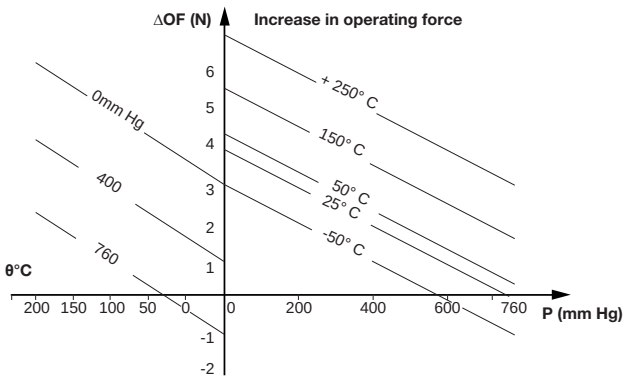
The detector will suffer damage if the overtravel force is raised to as much as 150 N.

Hermetic sealing

› The microswitch is filled with inert gas (nitrogen-hydrogen mixture), the internal pressure being 1 bar.

› The hermetic sealing (membrane-cap - cap-base) is achieved with a continuous seam welding bead.

Performance in qualification helium test condition. Qualification value: 1 x 10-8 atm cm3/s.



Change in operating force as a function of temperature and ambient pressure.

The force levels required to operate our hermetically sealed microswitches are affected by ambient pressure and temperature.

Here we give a graph showing how the operating force increases (ΔOF) as a function of these two parameters.

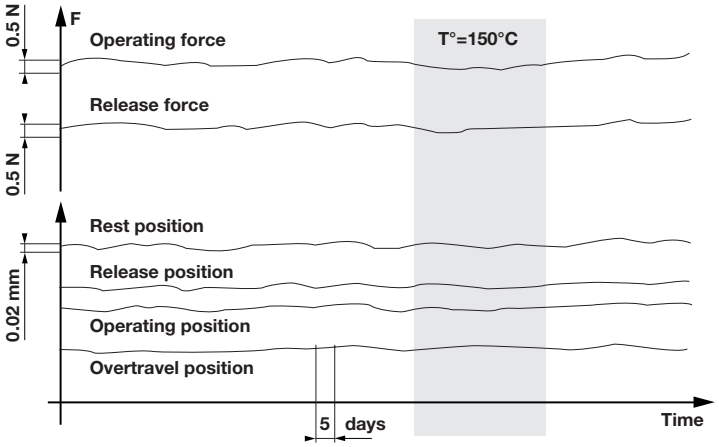
The characteristics are given for standard temperature (23 °C) and atmospheric pressure at sea level (760 mm Hg).

Our hermetically sealed microswitches can be used at pressures ranging from atmospheric to absolute vacuum and there are variants for use at higher pressures.

HERMETICALLY SEALED MICROSWITCH TYPES 83 151 (-55 °C TO 150 °C)

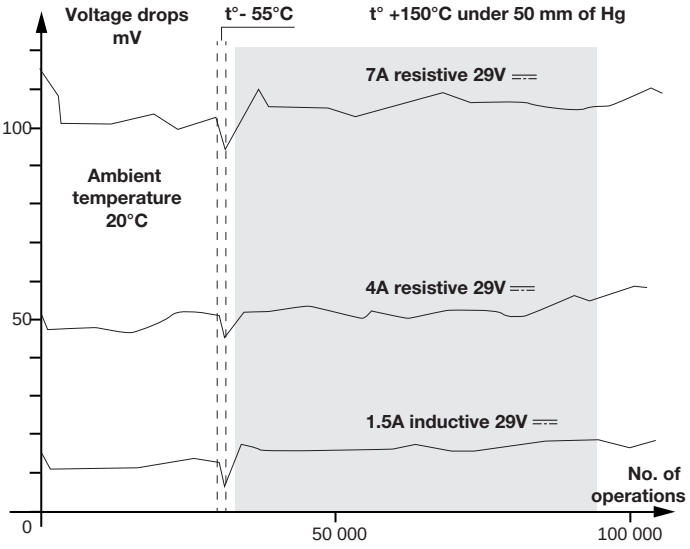
Reliability of characteristics

Below are two test extracts showing the stability of the essential characteristics over time and as a function of temperature.



Travels and forces

Change in the characteristics concerned under a constant load of 25 Newtons applied
to the operating device.



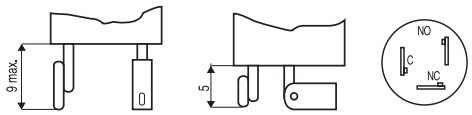
Voltage drops

Change in this characteristic in accordance with Air 8459 method - for 1.5-4 and 7 Amp load.

CONNECTIONS

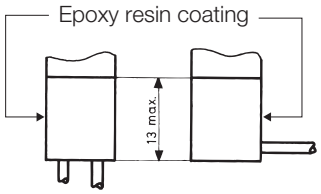
Electrical connections are made through the base, by three ferronickel terminals, with copper core, sealed by compressed glass.

Soldered



W2 W2N

Wired



parallel to axis (//) perpendicular to axis (⊥)

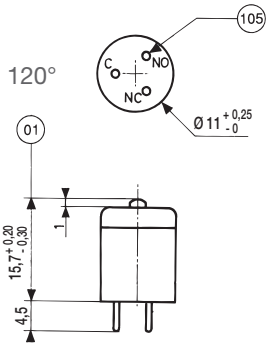
Electrical diagram (actuator at rest position)

green wire C

NC black wire
NO red wire

Dimensions (mm)

(01) Rest position
(105) 3 terminals Ø 1.3 at 120°



Wires: 0.38 mm² Air 4524 - length 0.50 m.

Category 140 °C 170 °C.

PERFORMANCE DATA

Product characteristics		Value	Unit	Under
Min. Current		1	mA	5 V DC
Nominal Current				
	Resistive	3	A	48 V DC (1)
	Lamp	1	A	115 V - 400 Hz
	Lamp	2	A	30 V DC (1)
	Resistive	3	A	30 V DC (1)
	Inductive L/R = 0.005 s	1.5	A	30 V DC (1)
	Resistive	1	A	220 V AC
	Inductive - cos φ 0.8	0.4	A	220 V AC
		200 000	Cycles	
Dielectric rigidity between connections and ground		1 200	V	
Rigidity between connections		1 000	V	
Insulation resistance (at 500 V DC)		100	MΩ	
Voltage drop at 1 A (2)		0.02	V	
Operating temperature		-55 to +150	°C	
Shock resistance (3)		200/11	G/ms	
Vibration resistance		80/20 → 2 000	G/Hz	

(1) for a service life of 100 000 cycles - Permitted current 4 A inductive 7 A resistive for normally open or normally closed contacts.
(2) Over soldered connections - for wired connections add 0.1 V per meter.
(3) Value for microswitch without auxiliary actuator

HERMETICALLY SEALED
MICROSWITCHES WITH ACCESSORIES

BASIC CELL (-55 °C TO +150 °C) TYPE 83 151 001

Criteria	Connections	with lateral flange	with 90° flange	Threaded barrel fixing
Pole(s)		1	1	1
Soldered connections	W2	83 151 012	83 151 014	83 151 013
	W2N	83 151 042	83 151 044	83 151 043
Wire 0.38 mm² - 0.5 m long	with parallel wires	83 151 022	83 151 024	83 151 023
	with perpendicular wires	83 151 032	83 151 034	83 151 033

Characteristics	Unit			
Max. Operating force	N	10	10	10
Min. Release force	N	1.5	1.5	1.5
Permitted Overtravel force	N	20	20	20
Positive Overtravel stop				
Service life	Operations - min	200 000	200 000	200 000
Max. Pre-travel	mm	0.25	0.25	0.25
Max. Differential travel	mm	0.05	0.05	0.05
Min. Overtravel	mm	0.08	0.08	0.08
Weight (without wires)	g	5	5	13

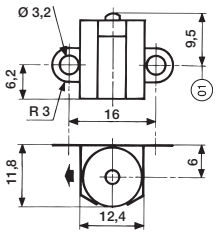
Dimensions (mm)

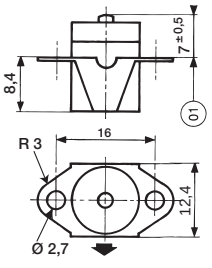
Add the dimensions of the various connections to find the total dimensions

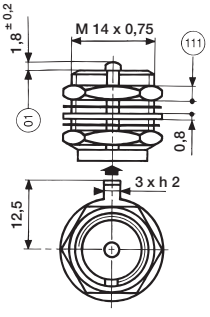
indicates the wire direction

(01) Tripping point

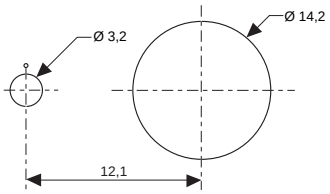
(111) Nut h 2.5 x 17/flat





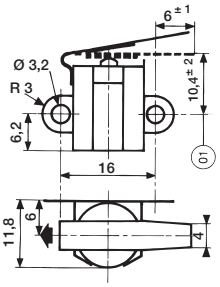


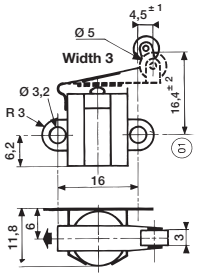
Panel cut-out

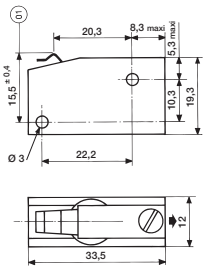


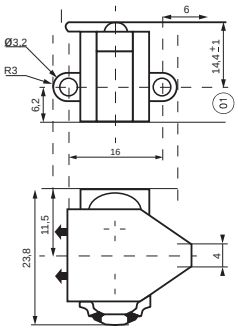
with lateral flange + lever	with lateral flange + roller lever	Housing + lever	with lateral flange + lever	with lateral flange + roller lever
1	1	1	2	2
83 560 011	83 560 012	83 560 014	83 560 311	83 560 312
83 560 041	83 560 042	83 560 049	83 560 341	83 560 342
83 560 021	83 560 022	83 560 030	83 560 321	83 560 322
83 560 031	83 560 032	83 560 039	83 560 331	83 560 332

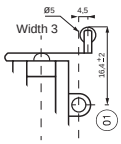
5	5	2.5 → 8	15	15
0.5	0.5	1.5	1.5	1.5
		50		
		•		
100 000	100 000	100 000	100 000	100 000
6	6	0.3 → 0.75	6	6
0.8	0.8	0.3	1.5	1.5
0.4 → 0.8	0.4 → 0.8	0.3	0.4 → 0.8	0.4 → 0.8
6	7	21	12	13











HERMETICALLY SEALED MICROSWITCHES
HIGH PRESSURE FROM 2 TO 6 BAR

WITH BASIC CELL (-55 °C TO +150 °C)

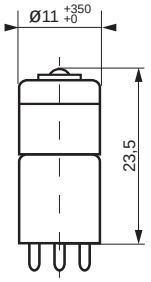
These variants of the basic type 83 151 feature a compensating system which allow them to be used at pressures above atmospheric.

For other characteristics please refer to basic model type 83 151 0

Characteristics			
Permitted pressure	Bar	2	6
Max. Operating force *	N	25	47
Max. permitted Overtravel force *	N	45	80
Min. Release force *	N	11	22
Weight (without leads)	g	8,5	8,5

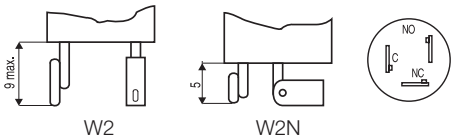
* Figures at atmospheric pressure at ground level

Dimensions (mm)



Connections

W2 Ref. 83 151 504
W2N Ref. 83 151 503

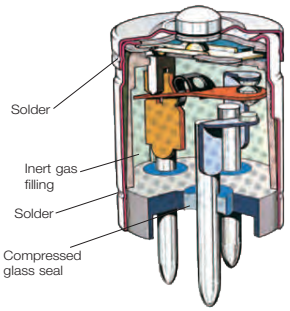


HERMETICALLY SEALED MICROSWITCHES TYPES 83 151 (250 °C)

WITHOUT ACCESSORIES (BASIC CELL -55°C TO +250 °C) TYPE 83 151 201

This basic component is the same design as the 83 151 001 standard cell but is adapted for operation in high temperatures up to 250 °C.

Characteristics	Unit	Value
Nominal current at 30 VDC		
Resistive	A	1
Inductive L/R = 5 ms	A	1
Service life at nominal current	Min. operations	20 000/100 000
Voltage drop at 1 A (1)	V	0.06
Max. Operating force (2)	N	14
Min. Release force	N	1.5
Max. permitted Overtravel force	N	20
Max. Pre-travel	mm	0.25
Max. Differential travel	mm	0.05
Min. Overtravel	mm	0.08
Weight (without wires)	g	13

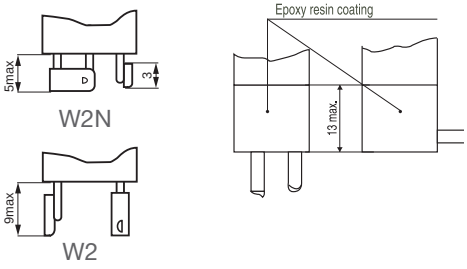


(1) On soldered connections. for wired connections add 0.18 V per meter. Category 250°, 280°.

(2) Characteristics at: θ = 250 °C atmospheric pressure at ground level.

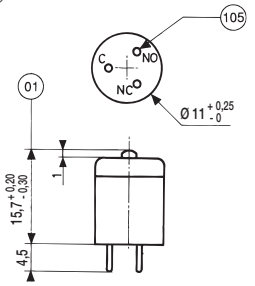
Connections

with wires: 500 mm of length or soldered terminals



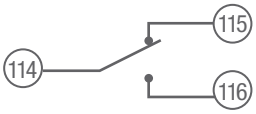
Dimensions (mm)

01 Rest position
105 3 terminals Ø 1.3 at 120°



Electrical diagram

114 C
115 NC
116 NO



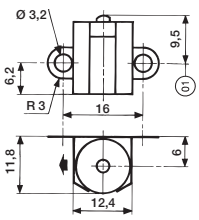
WITH ACCESSORIES (BASIC CELL -55 °C TO +250 °C) TYPE 83 151 201

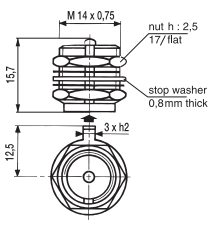
Control accessories equipped with type 83 151 201 sensitive changeover

Criteria		
Pole(s)	1	1
W2 terminals output	83 151 212	83 151 213
// wires output	83 151 222	83 151 223
⊥ wires output	83 151 232	83 151 233
W2N terminals output	83 151 242	83 151 243
Weight (without wires)	6 g	13 g

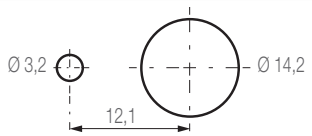
Add the dimensions of the various connections for the total dimensions. The mechanical characteristics are those of the 83 151 201 changeover.

▶ indicates the direction of the wires.





Panel cut-out



CROUZET SWITCHES

83229 Manually operating832295 Part number 832295

- Very compact dimensions
- Rating from 1 mA / 5 V DC to 5 A / 250 V AC
- Threaded barrel fixing
- Long mechanical life

Part numbers

	Type	Functions	Connections
832295	Manually operating832295	Changeover	W2 solder

Specifications

General characteristics

Microswitche	832290

Presentation

Threaded barrel nickel brass	•
Black dural button	•
Chrome-plated nut	•

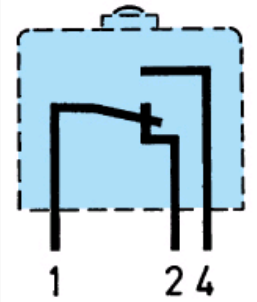
Mechanical characteristics

Protection against electric shocks to IEC 536 and NF 20030	Class I
Mechanical durability of operating device (operating cycles)	10^5
Weight (g)	5,5

Other characteristics

Mounting - Operation
See basic technical concepts.

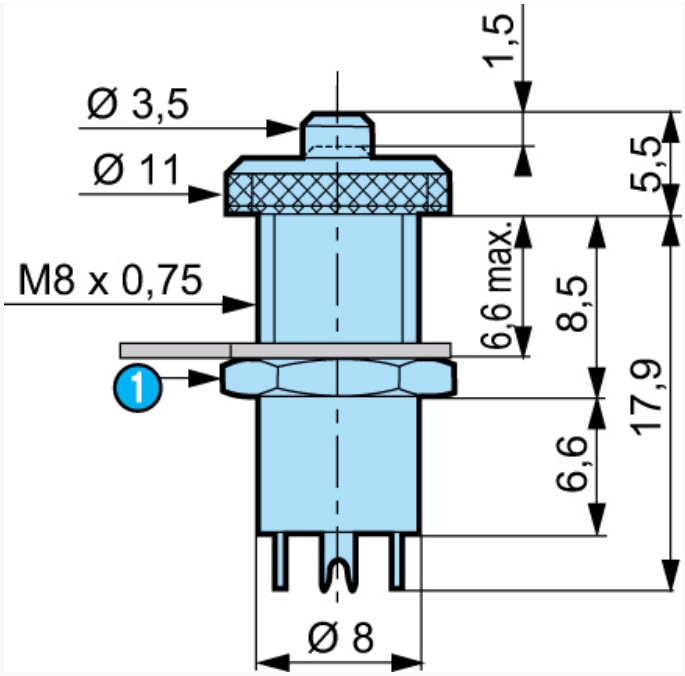
Principles



Dimensions (mm)

Product

832295

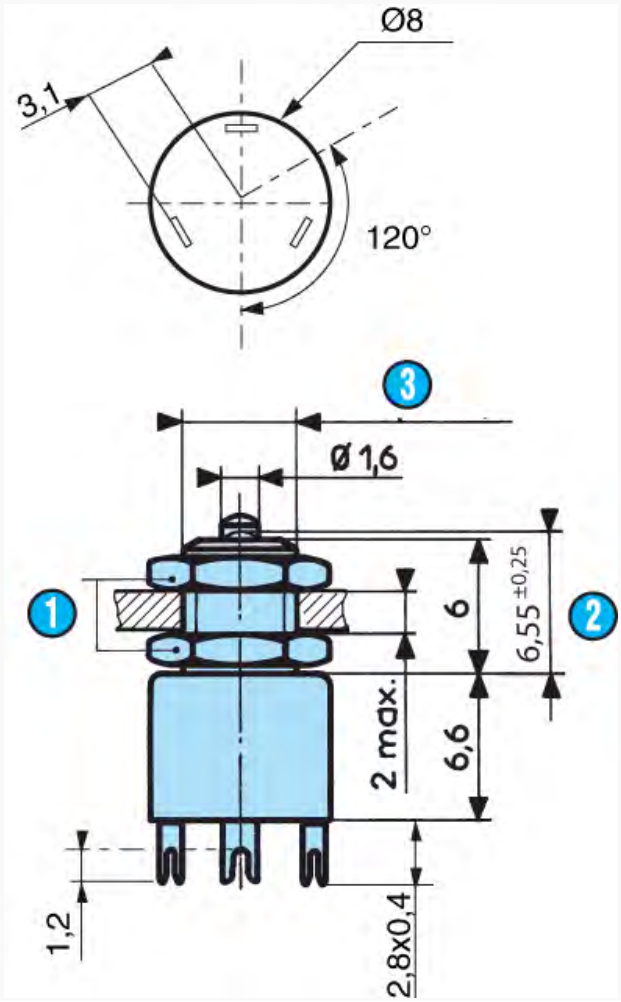


Nº	Legend
1	Retaining nut : 10 flats

Dimensions (mm)

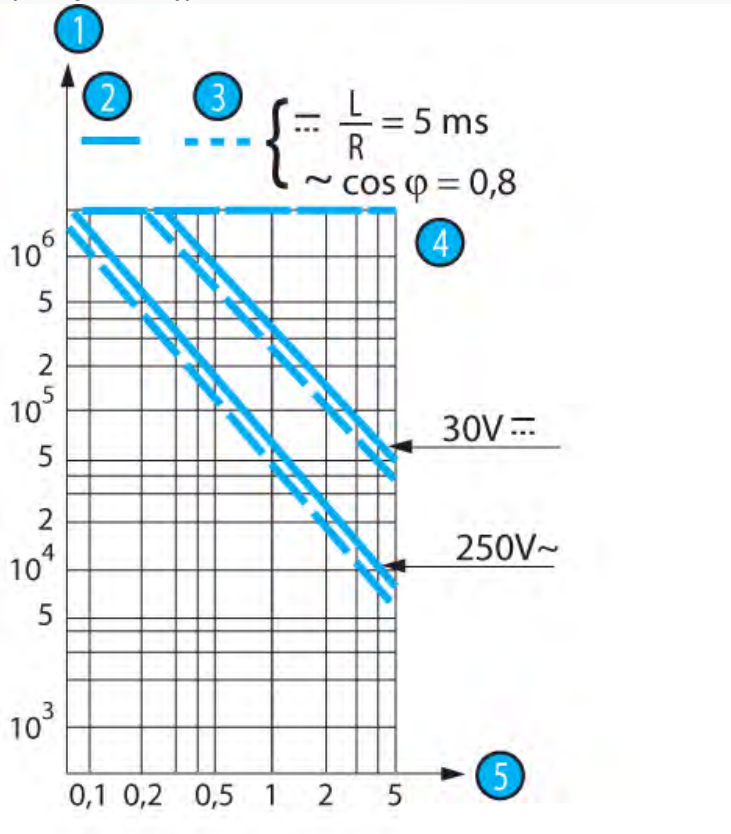
Connections

W2 solder



Curves

Operating curve for type 83229



N°	Legend
1	Number of operations
2	Resistive circuit
3	Inductive circuit
4	Rating in Amps

Other information

Accessories : please consult us.

SUBMINIATURE PUSHBUTTONS AND TOGGLES

8354

Standard microswitches
83 132 0 **83 133 0**


General specifications

Layout
Function C/O (changeover) Form Za

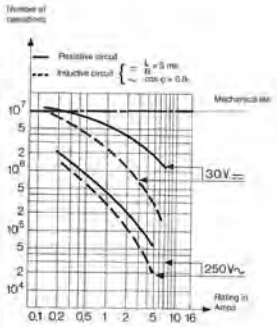

Approvals: UL - cUL on request

Electrical characteristics

Ie : 5 A - Ue : 250 V~

Thermal current : 11 A

Operating curve



Mounting - Operation

See basic technical concepts

Standard microswitches

Types	
Momentary action	1-pole
	2-pole
Maintained action	1-pole
	2-pole
Protection against electric shocks IEC 536 and NF 20030	

Features
Telescopic button
2 stable positions

Presentation
Threaded barrel
Chrome-plated nuts
Locating washer
Chrome-plated toggle

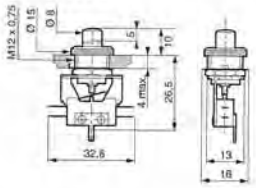
Connections	
83 132	**83 133**
W2 solder	**W2** solder

Mechanical characteristics	
Mechanical durability of operating device (operating cycles)	5 x 10⁵
Weight	25

Dimensions

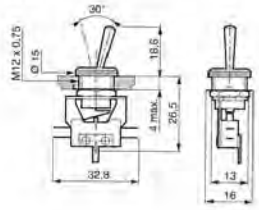
Panel cut-out
83 540
83 542 - 83 543
83 544 -

83 540 - 83 542



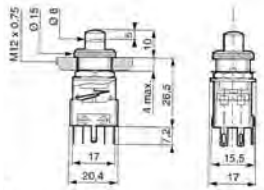
83 546 - 83 547

83 544

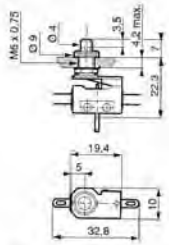


83 132 0	83 133 0	83 132 0	83 132 0	83 132 0	83 132 0
83 542 0	83 543 3	83 547 0	83 540 0	83 544 0	83 546 0
Class I	Class I	Class I	Class I	Class I	Class I
•	•	•	•	•	•
•	•	•		•	
•	•	•	•	•	•
•	•	•	•	•	•
			•	•	•
					•
5 x 10⁵	10⁵	5 x 10⁵	5 x 10⁵	10⁵	10⁵
25	13	17	20	12	6.5

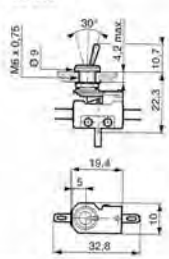
83 543



83 547

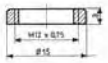


83 546



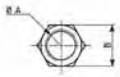
Accessories for threaded barrels

Knurled nuts



	Ø	Part number
Chrome-plated brass	12 x 0.75	70 162 306

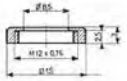
Hexagonal nuts



Thickness	B	Ø	Part number
1.5	8	6 x 0.75	70 514 222
1.5	10	8 x 0.75	70 528 225
1.5	14	12 x 0.75	70 602 118

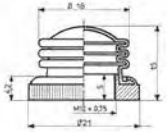
Bezels

	Ø	Part number
Chrome-plated brass	6 x 0.75	70 514 221



Chrome-plated brass	12 x 0.75	70 602 117

Sealing caps (silicon rubber)



Colour	Ø	Part number
Black	12	70 135 750
Red	12	70 135 751

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www.sentronic.com

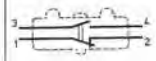
MINIATURE PUSHBUTTONS AND TOGGLES

8350
8351
8352
8353

Standard microswitch
83 106 0

General specifications

Layout
Function C/O (changeover)

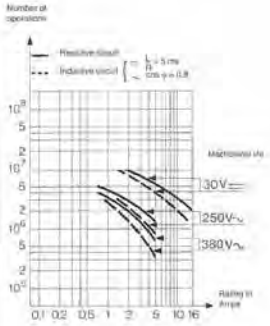


Connections
Screw terminals W1

Approvals: UL - cUL on request

Electrical characteristics

Assigned working current
Ie : 5 A - Ue : 250 V~
Thermal current : 17.5 A



Mounting - Operation

See basic technical concepts

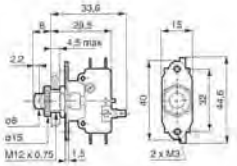
Standard microswitches						
Types						
Action	Momentary 1-pole					
	Maintained 1-pole					
Protection against electric shocks to IEC 536 and NF 20030						
Features						
Direct operating	•		•			
Telescopic button		•	•			
2 buttons - direct operating				•	•	
3 positions - automatic return to centre	•	•	•	•	•	
2 stable positions	•	•	•	•	•	•
Presentation						
Threaded barrel	•	•	•	•	•	•
Polyamide button	•	•	•	•	•	•
Chrome-plated brass button			•			
Chrome-plated brass nut	•	•	•	•	•	•
Polished aluminium cover - Label marked				•	•	•
Black polyamide toggle						
Nickel-plated key / Chrome-plated bezel						
NB : 83 518 0 : Supplied with 2 keys with identical number						
Mechanical characteristics						
Mechanical durability of operating device (operating cycles)	10^6	10^6	10^6	10^6	5×10^5	5×10^5	10^6
Weight	26	30	40	29	55	54	50

Dimensions

Panel cut-out

83 502
83 532

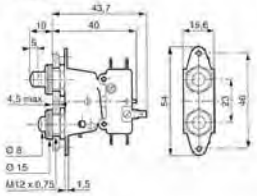
83 507



83 529
83 507

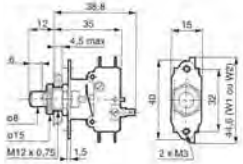
83 518

83 502

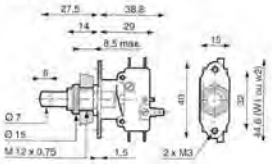


83 513
83 522
83 515

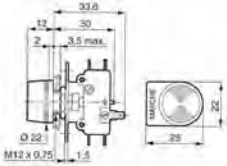
83 513



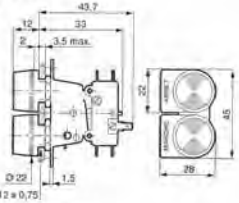
83 522



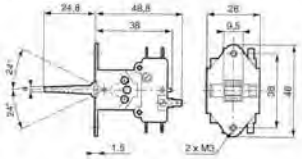
83 529



83 532

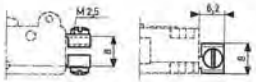


83515
83516



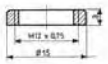
Connections

W1



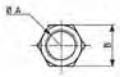
Accessories for threaded barrels

Knurled nuts



	Ø	Part number
Chrome-plated brass	12 x 0.75	70 162 306

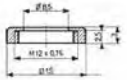
Hexagonal nuts



Thickness	B	Ø	Part number
1.5	8	6 x 0.75	70 514 222
1.5	10	8 x 0.75	70 528 225
1.5	14	12 x 0.75	70 602 118

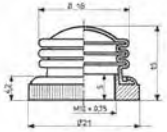
Bezels

	Ø	Part number
Chrome-plated brass	6 x 0.75	70 514 221



Chrome-plated brass	12 x 0.75	70 602 117

Sealing caps (silicon rubber)



Colour	Ø	Part number
Black	12	70 135 750
Red	12	70 135 751

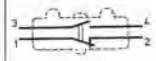
MINIATURE PUSHBUTTONS AND TOGGLES

8350
8351
8352
8353

Standard microswitch
83 106 0

General specifications

Layout
Function C/O (changeover)

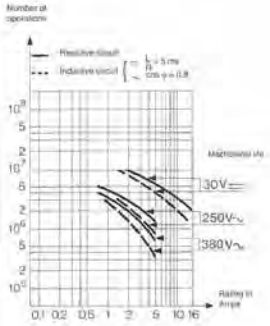


Connections
Screw terminals W1

Approvals: UL - cUL on request

Electrical characteristics

Assigned working current
Ie : 5 A - Ue : 250 V~
Thermal current : 17.5 A



Mounting - Operation

See basic technical concepts

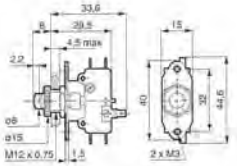
Standard microswitches						
Types						
Action	Momentary 1-pole					
	Maintained 1-pole					
Protection against electric shocks to IEC 536 and NF 20030						
Features						
Direct operating	•		•			
Telescopic button		•	•			
2 buttons - direct operating				•	•	
3 positions - automatic return to centre	•	•	•	•	•	
2 stable positions	•	•	•	•	•	•
Presentation						
Threaded barrel	•	•	•	•	•	•
Polyamide button	•	•	•	•	•	•
Chrome-plated brass button			•			
Chrome-plated brass nut	•	•	•	•	•	•
Polished aluminium cover - Label marked				•	•	•
Black polyamide toggle						
Nickel-plated key / Chrome-plated bezel						
NB : 83 518 0 : Supplied with 2 keys with identical number						
Mechanical characteristics						
Mechanical durability of operating device (operating cycles)	10^6	10^6	10^6	10^6	5×10^5	5×10^5	10^6
Weight	26	30	40	29	55	54	50

Dimensions

Panel cut-out

83 502
83 532

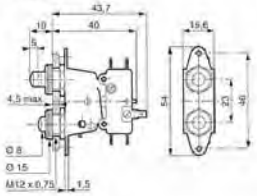
83 507



83 529
83 507

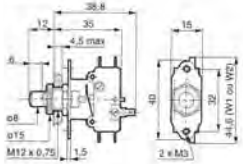
83 518

83 502



83 513
83 522
83 515

83 513



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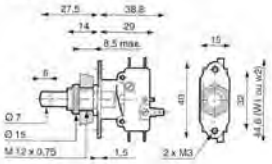

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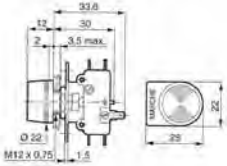

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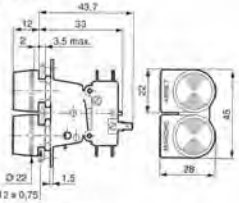
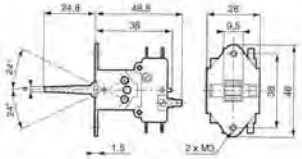
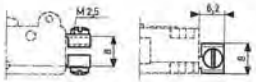


83515
83516



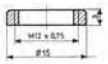
Connections

W1



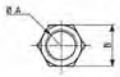
Accessories for threaded barrels

Knurled nuts



	Ø	Part number
Chrome-plated brass	12 x 0.75	70 162 306

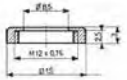
Hexagonal nuts



Thickness	B	Ø	Part number
1.5	8	6 x 0.75	70 514 222
1.5	10	8 x 0.75	70 528 225
1.5	14	12 x 0.75	70 602 118

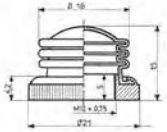
Bezels

	Ø	Part number
Chrome-plated brass	6 x 0.75	70 514 221



Chrome-plated brass	12 x 0.75	70 602 117

Sealing caps (silicon rubber)



Colour	Ø	Part number
Black	12	70 135 750
Red	12	70 135 751

PANORAMIC RANGE

PUSHBUTTONS	1 pole		2 pole	3 pole	4 pole
	Ø12	Ø14	Ø14		
					
Waterproof front face	Y/N		Y/N	N	N
Function	NO, NC or NO/NC		2 x NO/NC	3 x NO/NC	4 x NO/NC
Button	Ø4, Ø5, Ø7, Ø9.4 short or round or rectangular		Ø5, Ø9.4 or rectangular	Ø9	Ø8
Color	Black/Red/Grey/ White/Blue		Black/Red/Grey/ White/Blue	Black	Red
Terminal	Silver or Gold		Silver or Gold	Gold	Gold
Accessories	Monostable flap Bistable flap Bistable flap with auxiliary contact Electroluminescent ring		Monostable flap Bistable flap Bistable flap with auxiliary contact Electroluminescent ring	Monostable flap Bistable flap Bistable flap with auxiliary contact	Monostable flap Bistable flap Bistable flap with auxiliary contact

THUMBSTICK	Analogic	Analogic + validation
	Ø14	Ø24
			
Waterproof front face	Y	Y
Function	0 → 15 V	0 → 15 V
Button	Convex	Convex
Color	Black	Black
Terminal	Solder	Solder

MULTIWAY	2-way		2-way + validation	4-way	4-way double pole	4-way + validation
	Ø16	Ø18	Ø24	Ø16	Ø24	Ø24
							
Waterproof front face	Y/N	N	Y	Y/N	Y	Y
Function	NO	NO	NO	NO	NO	NO, NO/NC
Button	Rectangular, Concave, Convex	Convex	Cone, Concave, Convex, Castle	Concave, Cone, Convex, Long bat, Medium bat, short bat	Cone	Cone, Concave, Chinese, Castle
Color	Black	Black	Black	Black	Black/Grey	Black
Terminal	Silver or Gold	Silver or Gold	Silver or Gold	Silver, Gold or Tined	Silver	Silver or Gold

TRIGGER	1 position	2 positions
			
Waterproof front face	Y/N	Y/N
Function	NO, NC or NO/NC	2 x NO/NC or 4 x NO/NC
Color	Red/Black/Grey	Red/Black/Grey
Terminal	Silver or Gold	Silver or Gold

TRIM SWITCH	2-way		2-way + validation	4-way + validation
	Ø24	Customized	Ø24	Ø24
				
Waterproof front face	N		N	N
Function	2 x NO/NC + 2 x NO/NC		2 x NO + NO	4 x NO + NO
Button	Chinese	Pyramidal	Round	Round
Color	Black		Black	Black
Terminal	Gold		Silver	Silver

ROCKER	3 positions	3 positions	5 positions
				
Waterproof front face	N	N	N
Function	1x NO/NC + 1x NO/NC	2x NO/NC + 2x NO/NC	1x NO/NC + 1x NO/NC + 1x NO/NC + 1x NO/NC
Button	Rectangular	Gendarme	Rectangular
Color	Black	Black	Black
Terminal	Silver	Silver	Silver

TOGGLE (CONSULT US)	2 positions		3 positions	
	Ø6	Ø12	Ø6	Ø12
		 		
Waterproof front face	N	N	N	N
Function	1x NO + 1x NC	2 x NO + 2 x NC	2 x NO + 2 x NC	2 x NO + 2 x NC
Color	Black/Chrome	Black/Chrome	Chrome	Black/Chrome
Terminal	Silver	Gold	Silver	Silver or Gold
Accessories	Grey cap			

BUTTON PROTECTION			
Circular	Metallic flap guard	Plastic flap guard	Plastic flap guard with auxiliary contacts
			

COCKPIT EQUIPMENT

MULTIWAY

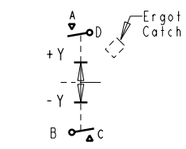
			Color	Electrical Configuration	Chinese	Chinese small	Chinese large	Rocker	Convex streak	Convex cross	Concave	Castle	Bat	Square	Convex + insert	QuickFix®
2D	1 pole Ø 16	non waterproof	black	NO	◆	◆	◆	83452504	83452515	◆	◆	◆	◆	◆	83452531	◆
		waterproof front face	black	NO	◆	◆	◆	83452518	83452519	◆	◆	◆	◆	◆	◆	◆
			grey	NO				83452510								◆
3D	1 pole Ø 24	waterproof front face	black	NO	83452709	◆	◆	◆	83452721 83452722	◆	83452718	◆	◆	◆	◆	◆
4D	1 pole Ø 16	non waterproof	black	NO	83452501 * 83452502 83452506 83452533	◆	◆	◆	◆	83452538	83452505 83452514	◆	◆	83452520	◆	◆
		waterproof front face	black	NO	* 83452516 83452521 83452524 83452525 * 83452529 83452534 83452572	83452570	* 83452576	◆	◆	◆	* 83452523 83452526 83452530 83452543 * 83452575	◆	83452535 83452540 * 83452578	83452527 83452539	◆	83452301
			blue	NO	◆	◆	◆	◆	◆	◆	83452542	◆	◆	◆	◆	◆
			grey	NO	◆	◆	◆	◆	◆	◆	83452511	◆	◆	◆	◆	◆
4D	2 pole Ø 24	waterproof front face	black	NO	83452513	◆	◆	◆	◆	◆	◆	◆	◆	83452528	◆	◆
			grey	NO	83452509	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
5D	1 pole Ø 24	waterproof front face	black	NO	83452701 83452706	◆	◆	◆	◆	◆	83452711 83452719	83452708 ◆	◆	◆	◆	◆
				NO/NC	83452702 83452707 83452717	◆	◆	◆	◆	◆	83452712	83452720	◆	◆	◆	◆

◆ CONTACT US FOR ANY MISSING REFERENCE

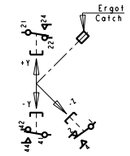
Low level - Gold plated

	2D	3D	4D	4D	5D
	1 pole Ø 16	1 pole Ø 24	1 pole Ø 16	2 pole Ø 24	1 pole Ø 24
	non waterproof / waterproof front face	waterproof front face	non waterproof / waterproof front face	waterproof front face	waterproof front face
Mechanical characteristics					
Operating force	3.5 N	3 N	3.5 N	6 N	3 N
Release force	0.6 N	0.6 N	0.6 N	1 N	0.6 N
Permissible force at end of travel	70 N max	70 N max	70 N max	70 N max	70 N max
Button strengthness pulling action	25 N max	25 N max	25 N max	80 N max	25 N max
Button strengthness pushing action	100 N max	100 N max	100 N max	100 N max	100 N max
Angle measured from axis to full travel	12°	12°	12°	12°	12°
Mechanical life	100 000 up to 500 000 cycles	100 000 cycles	100 000 up to 500 000 cycles	100 000 cycles	100 000 cycles
Electrical characteristics					
Output common	Separate or common	Separate	Separate or common	Separate	Separate
Voltage	5 VCC to 115 VAC 400 Hz	5 VCC to 115 VAC 400 Hz	5 VCC to 115 VAC 400 Hz	5 VCC to 115 VAC 400 Hz	5 VCC to 115 VAC 400 Hz
Current (resistive load)	0.5 mA to 2 A	0.5 mA to 2 A	0.5 mA to 2 A	0.5 mA to 2 A	0.5 mA to 2 A
Current (Inductive load)	1 A	1 A	1 A	1 A	1 A
Contact resistance	25 mOhm	25 mOhm	25 mOhm	25 mOhm	25 mOhm
Contact	silver or gold plated	silver or gold plated	silver or gold plated	silver or gold plated	silver or gold plated
Electrical life	100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles
Dielectric strength	1 200 V	1 200 V	1 200 V	1 200 V	1 200 V
General characteristics					
Case	polyamid 6.6 reinforced with 30% fiberglass	polyamid 6.6 reinforced with 30% fiberglass	polyamid 6.6 reinforced with 30% fiberglass	polyamid 6.6 reinforced with 30% fiberglass	polyamid 6.6 reinforced with 30% fiberglass
Button	acetate resin	acetate resin	acetate resin	acetate resin	acetate resin
Terminal	Solder lugs W2 silver	Solder lugs W2 silver	Solder lugs W2 silver	Solder lugs W2 silver	Solder lugs W2 silver
Waterproof front face	MIL STD 810 D-506.2 methode 2	MIL STD 810 D-506.2 methode 2	MIL STD 810 D-506.2 methode 2	MIL STD 810 D-506.2 methode 2	MIL STD 810 D-506.2 methode 2
Fixation	screw, glue	screw, glue	screw, glue	screw, glue	screw, glue
Operating temperature	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C
Storage temperature	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C
Weight	7.3g ±5% < M <15.7g ±5%	16g	7.3g ±5% < M <15.7g ±5%	13g	16g

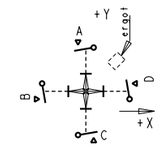
Electrical diagram



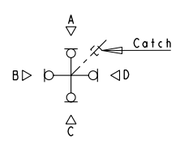
2D 1 pole



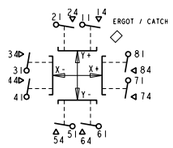
3D 1 pole



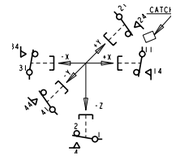
* 4D 1 pole separate common



4D 1 pole with common



4D 2 pole

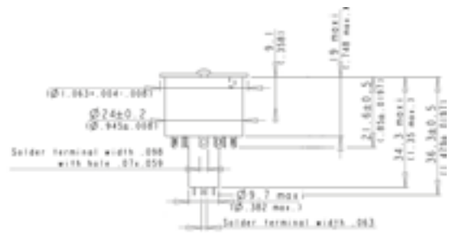


5D 1 pole

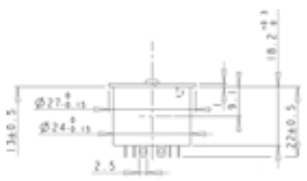
Dimensions

Ø 16 1 pole

Ø 16 QuikFix®



Ø 24 5D



Ø 24 2 pole

PANORAMIC RANGE

PUSHBUTTONS	1 pole		2 pole	3 pole	4 pole
	Ø12	Ø14	Ø14		
					
Waterproof front face	Y/N		Y/N	N	N
Function	NO, NC or NO/NC		2 x NO/NC	3 x NO/NC	4 x NO/NC
Button	Ø4, Ø5, Ø7, Ø9.4 short or round or rectangular		Ø5, Ø9.4 or rectangular	Ø9	Ø8
Color	Black/Red/Grey/ White/Blue		Black/Red/Grey/ White/Blue	Black	Red
Terminal	Silver or Gold		Silver or Gold	Gold	Gold
Accessories	Monostable flap Bistable flap Bistable flap with auxiliary contact Electroluminescent ring		Monostable flap Bistable flap Bistable flap with auxiliary contact Electroluminescent ring	Monostable flap Bistable flap Bistable flap with auxiliary contact	Monostable flap Bistable flap Bistable flap with auxiliary contact

THUMBSTICK	Analogic	Analogic + validation
	Ø14	Ø24
			
Waterproof front face	Y	Y
Function	0 → 15 V	0 → 15 V
Button	Convex	Convex
Color	Black	Black
Terminal	Solder	Solder

MULTIWAY	2-way		2-way + validation	4-way	4-way double pole	4-way + validation
	Ø16	Ø18	Ø24	Ø16	Ø24	Ø24
							
Waterproof front face	Y/N	N	Y	Y/N	Y	Y
Function	NO	NO	NO	NO	NO	NO, NO/NC
Button	Rectangular, Concave, Convex	Convex	Cone, Concave, Convex, Castle	Concave, Cone, Convex, Long bat, Medium bat, short bat	Cone	Cone, Concave, Chinese, Castle
Color	Black	Black	Black	Black	Black/Grey	Black
Terminal	Silver or Gold	Silver or Gold	Silver or Gold	Silver, Gold or Tined	Silver	Silver or Gold

TRIGGER	1 position	2 positions
			
Waterproof front face	Y/N	Y/N
Function	NO, NC or NO/NC	2 x NO/NC or 4 x NO/NC
Color	Red/Black/Grey	Red/Black/Grey
Terminal	Silver or Gold	Silver or Gold

TRIM SWITCH	2-way		2-way + validation	4-way + validation
	Ø24	Customized	Ø24	Ø24
				
Waterproof front face	N		N	N
Function	2 x NO/NC + 2 x NO/NC		2 x NO + NO	4 x NO + NO
Button	Chinese	Pyramidal	Round	Round
Color	Black		Black	Black
Terminal	Gold		Silver	Silver

ROCKER	3 positions	3 positions	5 positions
				
Waterproof front face	N	N	N
Function	1x NO/NC + 1x NO/NC	2x NO/NC + 2x NO/NC	1x NO/NC + 1x NO/NC + 1x NO/NC + 1x NO/NC
Button	Rectangular	Gendarme	Rectangular
Color	Black	Black	Black
Terminal	Silver	Silver	Silver

TOGGLE (CONSULT US)	2 positions		3 positions	
	Ø6	Ø12	Ø6	Ø12
		 		
Waterproof front face	N	N	N	N
Function	1x NO + 1x NC	2 x NO + 2 x NC	2 x NO + 2 x NC	2 x NO + 2 x NC
Color	Black/Chrome	Black/Chrome	Chrome	Black/Chrome
Terminal	Silver	Gold	Silver	Silver or Gold
Accessories	Grey cap			

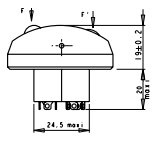
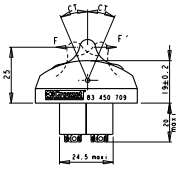
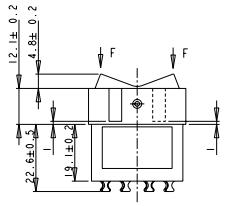
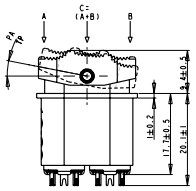
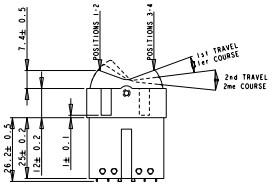
BUTTON PROTECTION			
Circular	Metallic flap guard	Plastic flap guard	Plastic flap guard with auxiliary contacts
			

ROCKER SWITCH

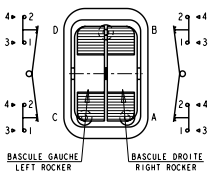
Electrical configuration	3 positions			3 positions + validation	5 positions
	2 x NO/NC + 2 x NO/NC	2 x NO/NC + 2 x NO/NC	1 x NO/NC + 1 x NO/NC	1 x NO/NC + 1 x NO/NC	1 x NO/NC + 1 x NO/NC
					
Flat	83450706	◆	83450503	83454201	83450505
Gendarme	◆	83450709	◆	◆	◆

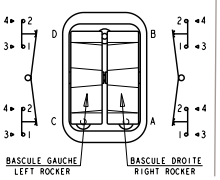
Mechanical characteristics					
Operating force per direction	9 N max	4 N max	10 N max	2.5 N	17 N → 25 N
Release force	1.2 N min	0.6 N min	2 N min	2 N min	2 N min
Permissible force at end of travel	50 N	40 N	80 N	80 N	80 N
Mechanical life	100 000 cycles	400 000 cycles	100 000 cycles	50 000 cycles	100 000 cycles
Electrical characteristics					
Voltage	5 VDC to 28 VDC	5 VDC to 28 VDC	5 VDC to 28 VDC	5 VDC to 28 VDC	5 VDC to 32 VDC
Current (resistor)	1 mA to 5 A	1 mA to 5 A	1 mA to 5 A	1 mA to 5 A	1 mA to 5 A
Current max @ 30VCC (self)	2 A	2 A	3.5 A	4 A	2 A
Current max @ 115VAC 400Hz (self)	2 A	2 A	2.5 A	1 A	2 A
Contact resistance	25 mOhm	25 mOhm	25 mOhm	25 mOhm	25 mOhm
Electrical life per direction	100 000 cycles	200 000 cycles	100 000 cycles	50 000 cycles	50 000 cycles
General characteristics					
Case	black polyamid 6.6	black polyamid 6.6	black polyamid 6.6	alumium alloy	black polyamid 6.6
Actuator	black polyamid 6.6	black polyamid 6.6	resin acetate	alumium alloy	resin acetate
Terminal	solder lugs, silver plated	solder lugs, silver plated	solder lugs, silver plated	solder lugs, silver plated	solder lugs, silver plated
Contact	silver	silver	silver	silver	silver
Operating temperature	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-40°C → +70°C	-15°C → +60°C
Storage temperature	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C
Weight	35g	35g	18g	12g	29g

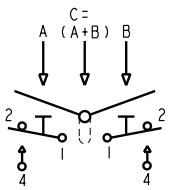
Dimensions

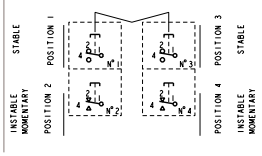






Electrical diagram







Basic technical concepts

Definitions

1 - Switch module: allows data to be entered in coded form.

2 - End caps : form the end pieces of a bank of switch modules and hold the bank in place on the panel.

3 - Separator module : allows 2 banks of switch modules to be combined into a single block.

4 - Spacer : non-working module which may have to be inserted in a bank of modules in certain cases.

5 - Coded blank module : allows two separate circuits to be switched simultaneously from a single actuator. It is actuated from the adjoining module via a coupling shaft.

Colours of modules and wheels

Grey modules.
Black wheels numbered in white.

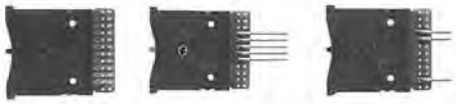
Lockout stops

These determine two range-end numbers, to be specified when ordering.
If required, the range-setting operation can be carried out by the user.

Connections

S	for soldering wires straight to switch or plugging connector onto switch
X2	By wire-wrap tags
X3	By solder tags to printed circuit

S **X2** **X3**



Connecting modules *(to form banks)*

84 210 - 211 - 212 **84 214**

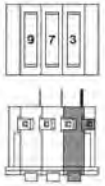
Mounting in panels

Mounted from front :
84 210 / 211 / 212
By spring clips (supplied in pairs) which have to be fitted to end caps or separator modules.
Clips can be fitted in either of two positions to suit thickness of panel.

84 214
By clips built into caps.

Switch output

Standard model : output on right



Connectors for 84 210 - 211 - 212

W2	Solder tags
X2	Wire-wrap tags
X3	Solder tags to printed circuit

W2 **X2** **X3**

Guide to selecting a thumbwheel switch

	Pitch (mm)	Overall height (mm)	Digit dimensions (mm)	Mounted from front	(A)	(B)	(C)	(D)	(E)	(F)	(G)	Page
Starwheel												
	8	33	4.5 x 2.8	●	●	●	※	※	※	※	※	3/4
Rocker												
	10	33	4.5 x 2.8	●	●	●	※	※	※	※	※	3/5
	12.5	58	6 x 3.75	●	●	●	※	※	※	※	※	3/5
	7.62	24	4 x 2.5	●	●	●	※	※	※			3/5

(A) **Decimal**
(B) **BCD**
(C) **BCD + complement**
(D) **Changeover**
(E) **BCD complement**
(F) **BCD excess 6 + complement**
(G) **Special two-pole plus/minus**

※ Please consult us

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Thumbwheel switches

Electrical characteristics

Assigned working voltage	0.1 → 48 V~
	0.1 → 48 V⎓
Nominal load current	0.1 → 100 mA
Max. non-switchable current	1 A
Max. internal resistance	200 m Ω
Min. insulation resistance	10^5 M Ω
– between tracks	600 V~
– between tracks and grounds	2500 V~

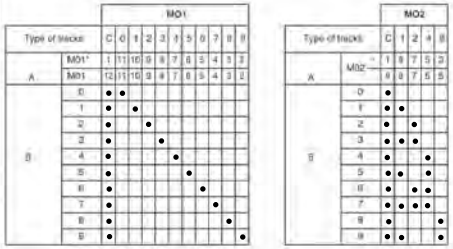
Mechanical characteristics

Electrical durability (operations) 10^7 Cycles

Environmental characteristics

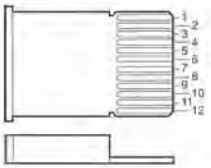
Ambient operating temperature - 25 + 70°C
Ambient storage temperature - 40 + 85°C

Standard codes



A - Position on printed circuit
B - Dial setting
* For 84 214 only

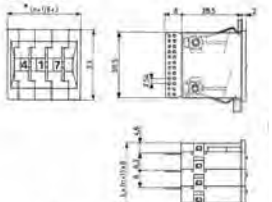
OUTPUT LAYOUT



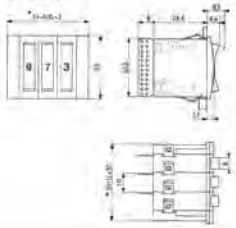
Features			Miniature, starwheel
Front mounting			•
Types			
Standard 10-position module			84 210 0
Standard codes			
Decimal		M 01	•
BCD		M 02	•
Circuits			
Short		C	•
Case	**Wheels**		
Grey G	Black N		•
Connections			
For soldering or for connector		S	•
Mounting accessories			
Pair of end caps (with clips)	Grey	JE/G	79 211 709
Spacer	Grey	MI/G	79 211 738
Separator module (with clips)	Grey	MS/G	79 211 752
Connectors			
Solder terminals		W2	25 625 493
For soldering to printed circuit		X3	25 625 495
Mechanical characteristics			
Operating force		N	3
Digit dimensions (H x L)		mm	4.5 x 2.8
Weight		g	5.5

Dimensions

84 210 0



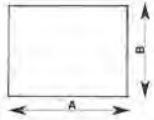
84 211 0



Miniature rocker | Large rocker | Subminiature rocker

	•	•	•
1	84 211 0	84 212 0	84 214 0
2	•	•	•
	•	•	•
	•	•	•
	•	•	•
3			
	•	•	•
4			
	79 211 823 79 211 814	79 211 923 79 211 914	79 214 282 79 214 219
	79 211 824	79 211 924	
5			
	25 625 493	25 625 493	
	25 625 495	25 625 495	
	5	4	5
	4.5 x 2.8	6 x 3.75	4 x 2.5
	7.5	14	3.5 → 4

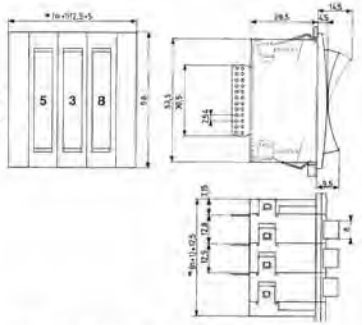
Panel cut-out



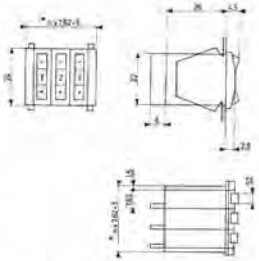
	A	B
84 210	(n+1) 8 + J	31
84 211	(n+1) 10 + J	31
84 212	(n+1) 12.5 + J	54
84 214	(nx7.62) + 35	22.5

Panel thickness

84 212 0



84 214 0

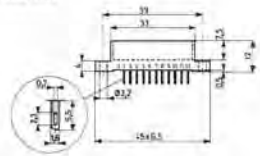


* n = number of modules
J = clearance : 1 mm for 1 ≤ n ≤ 10
1.5 mm for 11 ≤ n ≤ 20

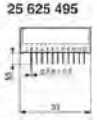
Output
Pitch 2 for decimal
Pitch 5 for BCD

Connector dimensions

25 625 493



25 625 495



Other information

For other versions, codes, colours, cases, wheels : please consult us.

To order, specify :

Standard products, non stocked

1 Type | 2 Code | 3 Connections | 4 Accessories | 5 Connectors

Example : Selector switch 84 210 0 M 01 C G N S - accessories 79 211 709 - connector 25 625 494

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PANORAMIC RANGE

PUSHBUTTONS	1 pole		2 pole	3 pole	4 pole
	Ø12	Ø14	Ø14		
					
Waterproof front face	Y/N		Y/N	N	N
Function	NO, NC or NO/NC		2 x NO/NC	3 x NO/NC	4 x NO/NC
Button	Ø4, Ø5, Ø7, Ø9.4 short or round or rectangular		Ø5, Ø9.4 or rectangular	Ø9	Ø8
Color	Black/Red/Grey/ White/Blue		Black/Red/Grey/ White/Blue	Black	Red
Terminal	Silver or Gold		Silver or Gold	Gold	Gold
Accessories	Monostable flap Bistable flap Bistable flap with auxiliary contact Electroluminescent ring		Monostable flap Bistable flap Bistable flap with auxiliary contact Electroluminescent ring	Monostable flap Bistable flap Bistable flap with auxiliary contact	Monostable flap Bistable flap Bistable flap with auxiliary contact

THUMBSTICK	Analogic	Analogic + validation
	Ø14	Ø24
			
Waterproof front face	Y	Y
Function	0 → 15 V	0 → 15 V
Button	Convex	Convex
Color	Black	Black
Terminal	Solder	Solder

MULTIWAY	2-way		2-way + validation	4-way	4-way double pole	4-way + validation
	Ø16	Ø18	Ø24	Ø16	Ø24	Ø24
							
Waterproof front face	Y/N	N	Y	Y/N	Y	Y
Function	NO	NO	NO	NO	NO	NO, NO/NC
Button	Rectangular, Concave, Convex	Convex	Cone, Concave, Convex, Castle	Concave, Cone, Convex, Long bat, Medium bat, short bat	Cone	Cone, Concave, Chinese, Castle
Color	Black	Black	Black	Black	Black/Grey	Black
Terminal	Silver or Gold	Silver or Gold	Silver or Gold	Silver, Gold or Tined	Silver	Silver or Gold

TRIGGER	1 position	2 positions
			
Waterproof front face	Y/N	Y/N
Function	NO, NC or NO/NC	2 x NO/NC or 4 x NO/NC
Color	Red/Black/Grey	Red/Black/Grey
Terminal	Silver or Gold	Silver or Gold

TRIM SWITCH	2-way		2-way + validation	4-way + validation
	Ø24	Customized	Ø24	Ø24
				
Waterproof front face	N		N	N
Function	2 x NO/NC + 2 x NO/NC		2 x NO + NO	4 x NO + NO
Button	Chinese	Pyramidal	Round	Round
Color	Black		Black	Black
Terminal	Gold		Silver	Silver

ROCKER	3 positions	3 positions	5 positions
				
Waterproof front face	N	N	N
Function	1x NO/NC + 1x NO/NC	2x NO/NC + 2x NO/NC	1x NO/NC + 1x NO/NC + 1x NO/NC + 1x NO/NC
Button	Rectangular	Gendarme	Rectangular
Color	Black	Black	Black
Terminal	Silver	Silver	Silver

TOGGLE (CONSULT US)	2 positions		3 positions	
	Ø6	Ø12	Ø6	Ø12
		 		
Waterproof front face	N	N	N	N
Function	1x NO + 1x NC	2 x NO + 2 x NC	2 x NO + 2 x NC	2 x NO + 2 x NC
Color	Black/Chrome	Black/Chrome	Chrome	Black/Chrome
Terminal	Silver	Gold	Silver	Silver or Gold
Accessories	Grey cap			

BUTTON PROTECTION			
Circular	Metallic flap guard	Plastic flap guard	Plastic flap guard with auxiliary contacts
			

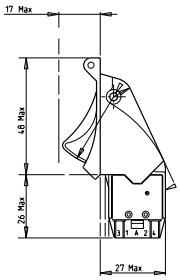
TRIGGER

		1 position						2 positions						
		non waterproof			waterproof			non waterproof				waterproof		
Color		black	red	grey	black	red	grey	black	red		grey	black	red	grey
Electrical configuration		2 x NO/NC	2 x NO/NC	2 x NO/NC	1 x NO/NC	2 x NO/NC	2 x NO/NC	2 x NO/NC	2 x NO/NC	4x NO/NC	2 x NO/NC	2 x NO/NC	2 x NO/NC	2 x NO/NC
MOM		83574008	83574004	83574009	83574507	83574504	83574502	83574007	83574001	◆	83574010	83574514	83574555 83574505	83574501
MOM + FLAP GUARD		◆	83574006	◆	◆	83574503	◆	83574011	83574013	83574512	◆	◆	83574509 83574511 83574559	◆
MOM + LOCKING HOLE		◆	◆	◆	◆	◆	◆	83574012	◆	◆	◆	◆	◆	◆
MOM + FLAP+ LOCKING HOLE		◆	◆	◆	◆	◆	◆	◆	83574014	◆	◆	◆	◆	◆
Mechanical characteristics														
Operating force first position		12 N	30 N	12 N	16 N	20 N	16 N	12 N	12 N	12 N	12 N	20 N	20 N	20 N
Release force first position		2 N	2 N	2 N	4 N	4 N	4 N	2 N	2 N	2 N	2 N	4 N	4 N	4 N
Operating force second position		-	-	-	-	-	-	40 N	40 N	30 N	30 N	33 N	33 N	33 N
Total travel first position		14°	11°	14°	9°	14°	12°	12°	12°	12°	12°	12°	12°	12°
Total travel second position		-	-	-	-	-	-	22°	22°	22°	22°	22°	22°	22°
Mechanical life		100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles	100 000 cycles
Electrical characteristics														
Voltage		14 VDC to 30 VDC	14 VDC to 30 VDC	14 VDC to 30 VDC	14 VDC to 30 VDC	14 VDC to 30 VDC	14 VDC to 30 VDC	14 VDC to 30 VDC	14 VDC to 30 VDC	14 VDC to 30 VDC	14 VDC to 30 VDC	5 VDC to 32 VDC	14 VDC to 30 VDC	14 VDC to 30 VDC
Current (resistor)		6 A	6 A	6 A	6 A	6 A	6 A	6 A	6 A	2 A	6 A	20 mA	6 A	6 A
Current max @ 30VCC (self)		3 A	3 A	3 A	3 A	3 A	3 A	3 A	3 A	-	3 A	-	3 A	3 A
Electrical endurance		50 000 cycles	100 000 cycles	50 000 cycles	50 000 cycles	50 000 cycles	50 000 cycles	50 000 cycles	50 000 cycles	100 000 cycles	50 000 cycles	50 000 cycles	50 000 cycles	50 000 cycles
General characteristics														
Case		black polyamid 6.6	black polyamid 6.6	black polyamid 6.6	Thermoplastic inox	Thermoplastic inox	Thermoplastic inox	black polyamid 6.6	black polyamid 6.6	black polyamid 6.6	black polyamid 6.6	Thermoplastic inox	Thermoplastic inox	Thermoplastic inox
Button		Acetate resin	Acetate resin	Acetate resin	Acetate resin	Acetate resin	Acetate resin	Acetate resin	Acetate resin	Acetate resin	Acetate resin	Acetate resin	Acetate resin	Acetate resin
Terminal		solder lugs, cupper nickel	solder lugs, cupper nickel	solder lugs, cupper nickel	solder lugs, cupper nickel	solder lugs, cupper nickel	solder lugs, cupper nickel	solder lugs, cupper nickel	solder lugs, cupper nickel	solder pin	solder lugs, cupper nickel	solder lugs, cupper nickel	solder lugs, cupper nickel	solder lugs, cupper nickel
Contact		silver	silver	silver	silver	silver	silver	silver	silver		silver	silver	silver	silver
Operating temperature		-55°C → +85°C	-15°C → +60°C	-55°C → +85°C	-35°C → +75°C	-35°C → +75°C	-35°C → +75°C	-55°C → +85°C	-55°C → +85°C	-15°C → +60°C	-55°C → +85°C	-35°C → +75°C	-35°C → +75°C	-35°C → +75°C
Storage temperature		-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C
Weight		40g	22g	22g	25g	27g	25g	22g	22g	38g	22g	25g	27g	25g

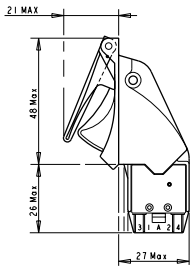
Low level - Gold plated

Dimensions

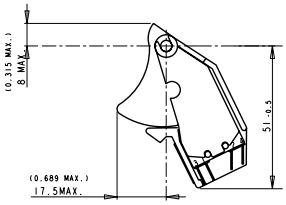
MOM



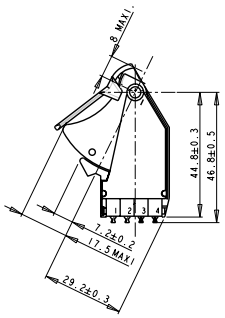
MOM + FLAP GUARD



MOM + LOCKING HOLE

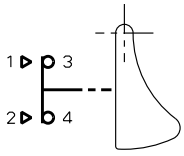


MOM + FLAP+ LOCKING HOLE

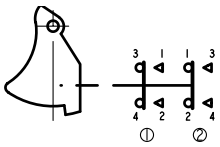


Electrical diagram

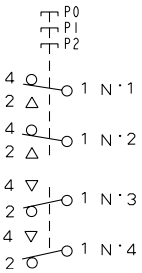
1 x NO/NC



2 x NO/NC



4 x NO/NC



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www.sentronic.com

PANORAMIC RANGE

PUSHBUTTONS	1 pole		2 pole	3 pole	4 pole
	Ø12	Ø14	Ø14		
					
Waterproof front face	Y/N		Y/N	N	N
Function	NO, NC or NO/NC		2 x NO/NC	3 x NO/NC	4 x NO/NC
Button	Ø4, Ø5, Ø7, Ø9.4 short or round or rectangular		Ø5, Ø9.4 or rectangular	Ø9	Ø8
Color	Black/Red/Grey/ White/Blue		Black/Red/Grey/ White/Blue	Black	Red
Terminal	Silver or Gold		Silver or Gold	Gold	Gold
Accessories	Monostable flap Bistable flap Bistable flap with auxiliary contact Electroluminescent ring		Monostable flap Bistable flap Bistable flap with auxiliary contact Electroluminescent ring	Monostable flap Bistable flap Bistable flap with auxiliary contact	Monostable flap Bistable flap Bistable flap with auxiliary contact

THUMBSTICK	Analogic	Analogic + validation
	Ø14	Ø24
			
Waterproof front face	Y	Y
Function	0 → 15 V	0 → 15 V
Button	Convex	Convex
Color	Black	Black
Terminal	Solder	Solder

MULTIWAY	2-way		2-way + validation	4-way	4-way double pole	4-way + validation
	Ø16	Ø18	Ø24	Ø16	Ø24	Ø24
							
Waterproof front face	Y/N	N	Y	Y/N	Y	Y
Function	NO	NO	NO	NO	NO	NO, NO/NC
Button	Rectangular, Concave, Convex	Convex	Cone, Concave, Convex, Castle	Concave, Cone, Convex, Long bat, Medium bat, short bat	Cone	Cone, Concave, Chinese, Castle
Color	Black	Black	Black	Black	Black/Grey	Black
Terminal	Silver or Gold	Silver or Gold	Silver or Gold	Silver, Gold or Tined	Silver	Silver or Gold

TRIGGER	1 position	2 positions
			
Waterproof front face	Y/N	Y/N
Function	NO, NC or NO/NC	2 x NO/NC or 4 x NO/NC
Color	Red/Black/Grey	Red/Black/Grey
Terminal	Silver or Gold	Silver or Gold

TRIM SWITCH	2-way		2-way + validation	4-way + validation
	Ø24	Customized	Ø24	Ø24
				
Waterproof front face	N		N	N
Function	2 x NO/NC + 2 x NO/NC		2 x NO + NO	4 x NO + NO
Button	Chinese	Pyramidal	Round	Round
Color	Black		Black	Black
Terminal	Gold		Silver	Silver

ROCKER	3 positions	3 positions	5 positions
				
Waterproof front face	N	N	N
Function	1x NO/NC + 1x NO/NC	2x NO/NC + 2x NO/NC	1x NO/NC + 1x NO/NC + 1x NO/NC + 1x NO/NC
Button	Rectangular	Gendarme	Rectangular
Color	Black	Black	Black
Terminal	Silver	Silver	Silver

TOGGLE (CONSULT US)	2 positions		3 positions	
	Ø6	Ø12	Ø6	Ø12
		 		
Waterproof front face	N	N	N	N
Function	1x NO + 1x NC	2 x NO + 2 x NC	2 x NO + 2 x NC	2 x NO + 2 x NC
Color	Black/Chrome	Black/Chrome	Chrome	Black/Chrome
Terminal	Silver	Gold	Silver	Silver or Gold
Accessories	Grey cap			

BUTTON PROTECTION			
Circular	Metallic flap guard	Plastic flap guard	Plastic flap guard with auxiliary contacts
			

PUSHBUTTONS
1 POLE

			Color	Electrical configuration	Ø 4	Ø 7	Ø 7 + bezel	Ø 7 + bayonet	QuickFix®
Ø 12	1 pole Double-throw	No seal	black	NO	◆	83450701	83450712	83450738	◆
				NO/NC	83450714	83450702	83450717 83450718 83450720 83450728	◆	◆
			red	NO	◆	83450704	◆	◆	◆
				NO/NC	◆	83450703	83450719	◆	◆
			grey	NO	◆		83450711	◆	◆
		Front face seal	black	NO/NC	83450724	83450713 83450716 83450715 83450732	83450723	◆	83450301
			red	NO/NC	◆	83450708	83450722	◆	◆
			grey	NO/NC	◆	83450707	83450721	◆	◆
			blue	NO/NC	◆	83450729	◆	◆	◆

◆ CONTACT US FOR ANY MISSING REFERENCE

Low level - Gold plated

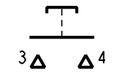
	1 pole	
	No seal	Front face seal
Mechanical characteristics		
Operating force	8 N →16 N max	8 N → 16 N max
Release force	3 N min	3 N min
Permissible force at end of travel	100 N	100 N
Overtravel	0.4 mm min	0.4 mm min
Total travel	2 mm ± 0.4	2 mm ± 0.4
Return overtravel	0.4 min	0.4 min
Mechanical life	300 000 cycles	100 000 cycles
Electrical characteristics		
Voltage	5 VCC to 115 VAC 400 Hz	5 VCC to 115 VAC 400 Hz
Current (resistive load)	0.1 mA to 7.5 A	0.1 mA to 7.5 A
Current (inductive load)	2 A	2 A
Contact resistance	25 mOhm	25 mOhm
Electrical life	100 000 cycles	100 000 cycles
Dielectric strength	1 200 V	1 200 V
General characteristics		
Case	polyamid 6.6 reinforced with 30% fiberglass	polyamid 6.6 reinforced with 30% fiberglass
Button	acetate resin	acetate resin
Terminal	Soldering lugs W2 silver or gold plated	Soldering lugs W2 silver or gold plated
Waterproof front face	-	MIL STD 810 D-506.2 methode 2
Operating temperature	-55°C → +85°C	-55°C → +85°C
Storage temperature	-55°C → +85°C	-55°C → +85°C
Weight	3.6g ±5% < M < 7.6g ±5%	3.6g ±5% < M < 7.6g ±5%

			Color	Electrical configuration	Ø 5	Ø 5 + guard	Ø 9.4	Ø 9.4 short hat	Ø 9.4 short hat + guard	Ø 9.4 round	Ø 9.4 1/4 turn fixation (or bayonet)	Ø 9.4 long travel	concave	QuickFix®
Ø 14	1 pole Double-throw	No seal	black	NO/NC	83450501	◆	83450001	◆	83450014	83450025	83450019 83450026 83450030 83450035 83450032	83451001	83450506	83450401 83450402 83450403
			red	NO/NC	83450502	83450511	83450002	83450008	◆	◆	83450029	◆	◆	83450404
			grey	NO/NC	◆	◆	◆	83450017	◆	◆	◆	◆	◆	◆
			white	NO/NC	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
		Front face seal	black	NO/NC	83450512	◆	83450006 83450028	83450012	◆	83450013	◆	83451003 83451004	83450513	◆
			red	NO/NC	83450510	◆	83450007	83450011	◆	◆	◆	◆	◆	◆
			grey	NO/NC	83450509	◆	83450005 83450015	83450010	83450009 83450018	◆	◆	◆	◆	◆
			blue	NO/NC	83450514	◆	83450016	83450036	◆	◆	◆	◆	◆	◆

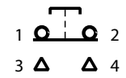
◆ CONTACT US FOR ANY MISSING REFERENCE

Low level - Gold plated

Electrical diagram

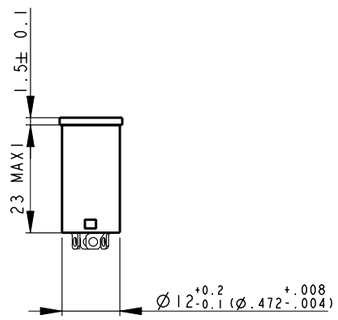


NO

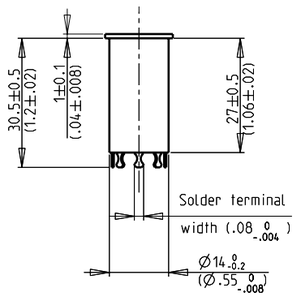


NO/NC

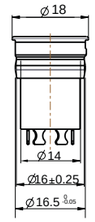
Dimensions



Ø12



Ø14



Ø14 QuickFix®

COCKPIT EQUIPMENT

PUSHBUTTONS
2, 3 & 4 POLE

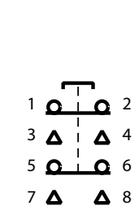
			Color	Electrical Configuration	Ø 5	Ø 5 +guard	Ø 5 high strength	Ø 8	Ø 9.4	Ø 9.4 higher strength	Ø 9.4 short hat	Ø 9.4 short hat+ higher strength	Ø 9.4 short hat+guard	Ø 9.4 short hat+guard + higher strength	Ø 9.4 round	Ø 9.4 luminescent ring	Ø 9.4 screw fixation	Ø 9.4 +wires	Ø 9.4 1/4 turn fixation (or bayonet)	Ø 9.4 long travel	Ø 12 concave	rectangular	rectangular high strength	QuickFix®
Ø 14	2 pole Double-throw	No seal	black	2 x NO/NC	83453501	◆	◆	◆	83453001	◆	83453005	◆	83453006	◆	◆	◆	◆	◆	◆	83453026	◆	◆	83453506	◆
			red	2 x NO/NC	83453502	◆	◆	◆	83453002 83453028	◆	83453015	◆	◆	◆	◆	◆	83453040	83453019	◆	◆	◆	◆	◆	◆
			white	2 x NO/NC	83453516	◆	◆	◆	◆	◆	83453025	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
			grey	2 x NO/NC	◆	◆	◆	◆	83453018	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
		Front face seal	black	2 x NO/NC	83453511 83453517	◆ 83453509 83453518	83453510	◆	83453012 83453020	83453039	83453013 83453032	◆	83453017 83453045	83453029	83453031 83453034	◆	◆	◆	◆	◆	83453014	83453514	◆	◆
			red	2 x NO/NC	83453508	83453512	◆	◆	83453010 83453036	83453022	83453033	83453024	83453011	83453023	83453021	83453027	◆	◆	83453035	◆	◆	◆	◆	83453311
			grey	2 x NO/NC	83453507	◆	◆	◆	83453008	◆	◆	◆	83453009	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	83453310
			blue	2 x NO/NC	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	83453030	◆	◆	◆	◆	◆
	3 pole	No seal	black	3 x NO/NC				◆	83460115		◆				◆	◆		◆	◆			◆		◆
	4 pole		red	4 x NO/NC				◆	◆		◆				◆	◆		◆	83460117			◆		◆

◆ CONTACT US FOR ANY MISSING REFERENCE

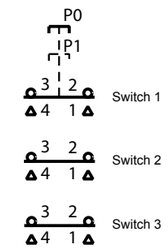
Low level - Gold plated

	2 pole		3 pole	4 pole
	No seal	Front face seal	No seal	No seal
Mechanical characteristics				
Operating force	8 N → 16 N max	8 N → 16 N max	6.7 N max	1 N max
Release force	3 N min	3 N min	3 N min	1.1 N min
Permissible force at end of travel	100 N	100 N	100 N	100 N
Overtravel	0.4 mm min	0.4 mm min	-	-
Total travel	2 mm ± 0.4	2 mm ± 0.4	-	-
Return overtravel	0.4 mm min	0.4 mm min	-	-
Mechanical life	300 000 cycles	100 000 cycles	600 000 cycles	100 000 cycles
Electrical characteristics				
Voltage	5 VCC to 115 VAC 400 Hz	5 VCC to 115 VAC 400 Hz	14 VDC to 28 VDC	14 VDC to 28 VDC
Current (resistive load)	0.1 mA to 7.5 A	0.1 mA to 7.5 A	3 mA to 5 A	1 mA to 1 A
Current (inductive load)	2 A	2 A	3 A	2 A
Contact resistance	25 mOhm	25 mOhm	25 mOhm	25 mOhm
Electrical life	100 000 cycles	100 000 cycles	50 000 cycles	100 000 cycles
Dielectric strength	1 200 V	1 200 V	1 200 V	1 200 V
General characteristics				
Case	polyamid 6.6 reinforced with 30% fiberglass	polyamid 6.6 reinforced with 30% fiberglass	diallyl	diallyl
Button	acetate resin	acetate resin	acetate resin	acetate resin
Terminal	Soldering lugs W2 silver or gold plated	Soldering lugs W2 silver or gold plated	Soldering terminal brass, gold plated	Soldering terminal brass, gold plated
Waterproof front face	-	MIL STD 810 D-506.2 methode 2	-	-
Operating temperature	-55°C → +85°C	-55°C → +85°C	-40°C → +70°C	-40°C → +70°C
Storage temperature	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C	-55°C → +85°C
Weight	3.6g ±5% < M < 7.7g ±5%	3.6g ±5% < M < 7.7g ±5%	20g	20g

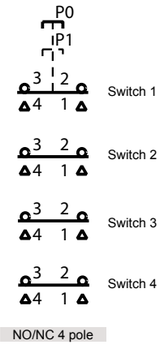
Electrical diagram



NO/NC 2 pole

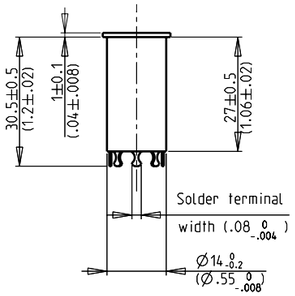


NO/NC 3 pole

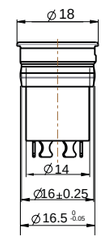


NO/NC 4 pole

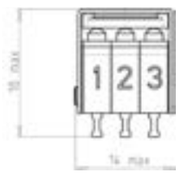
Dimensions



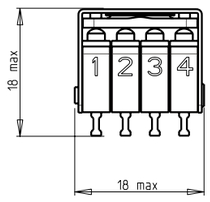
2 pole Ø14



Ø14 QuickFix®



3 pole



4 pole

PANORAMIC RANGE

PUSHBUTTONS	1 pole		2 pole	3 pole	4 pole
	Ø12	Ø14	Ø14		
					
Waterproof front face	Y/N		Y/N	N	N
Function	NO, NC or NO/NC		2 x NO/NC	3 x NO/NC	4 x NO/NC
Button	Ø4, Ø5, Ø7, Ø9.4 short or round or rectangular		Ø5, Ø9.4 or rectangular	Ø9	Ø8
Color	Black/Red/Grey/ White/Blue		Black/Red/Grey/ White/Blue	Black	Red
Terminal	Silver or Gold		Silver or Gold	Gold	Gold
Accessories	Monostable flap Bistable flap Bistable flap with auxiliary contact Electroluminescent ring		Monostable flap Bistable flap Bistable flap with auxiliary contact Electroluminescent ring	Monostable flap Bistable flap Bistable flap with auxiliary contact	Monostable flap Bistable flap Bistable flap with auxiliary contact

THUMBSTICK	Analogic	Analogic + validation
	Ø14	Ø24
			
Waterproof front face	Y	Y
Function	0 → 15 V	0 → 15 V
Button	Convex	Convex
Color	Black	Black
Terminal	Solder	Solder

MULTIWAY	2-way		2-way + validation	4-way	4-way double pole	4-way + validation
	Ø16	Ø18	Ø24	Ø16	Ø24	Ø24
							
Waterproof front face	Y/N	N	Y	Y/N	Y	Y
Function	NO	NO	NO	NO	NO	NO, NO/NC
Button	Rectangular, Concave, Convex	Convex	Cone, Concave, Convex, Castle	Concave, Cone, Convex, Long bat, Medium bat, short bat	Cone	Cone, Concave, Chinese, Castle
Color	Black	Black	Black	Black	Black/Grey	Black
Terminal	Silver or Gold	Silver or Gold	Silver or Gold	Silver, Gold or Tined	Silver	Silver or Gold

TRIGGER	1 position	2 positions
			
Waterproof front face	Y/N	Y/N
Function	NO, NC or NO/NC	2 x NO/NC or 4 x NO/NC
Color	Red/Black/Grey	Red/Black/Grey
Terminal	Silver or Gold	Silver or Gold

TRIM SWITCH	2-way		2-way + validation	4-way + validation
	Ø24	Customized	Ø24	Ø24
				
Waterproof front face	N		N	N
Function	2 x NO/NC + 2 x NO/NC		2 x NO + NO	4 x NO + NO
Button	Chinese	Pyramidal	Round	Round
Color	Black		Black	Black
Terminal	Gold		Silver	Silver

ROCKER	3 positions	3 positions	5 positions
				
Waterproof front face	N	N	N
Function	1x NO/NC + 1x NO/NC	2x NO/NC + 2x NO/NC	1x NO/NC + 1x NO/NC + 1x NO/NC + 1x NO/NC
Button	Rectangular	Gendarme	Rectangular
Color	Black	Black	Black
Terminal	Silver	Silver	Silver

TOGGLE (CONSULT US)	2 positions		3 positions	
	Ø6	Ø12	Ø6	Ø12
		 		
Waterproof front face	N	N	N	N
Function	1x NO + 1x NC	2 x NO + 2 x NC	2 x NO + 2 x NC	2 x NO + 2 x NC
Color	Black/Chrome	Black/Chrome	Chrome	Black/Chrome
Terminal	Silver	Gold	Silver	Silver or Gold
Accessories	Grey cap			

BUTTON PROTECTION			
Circular	Metallic flap guard	Plastic flap guard	Plastic flap guard with auxiliary contacts