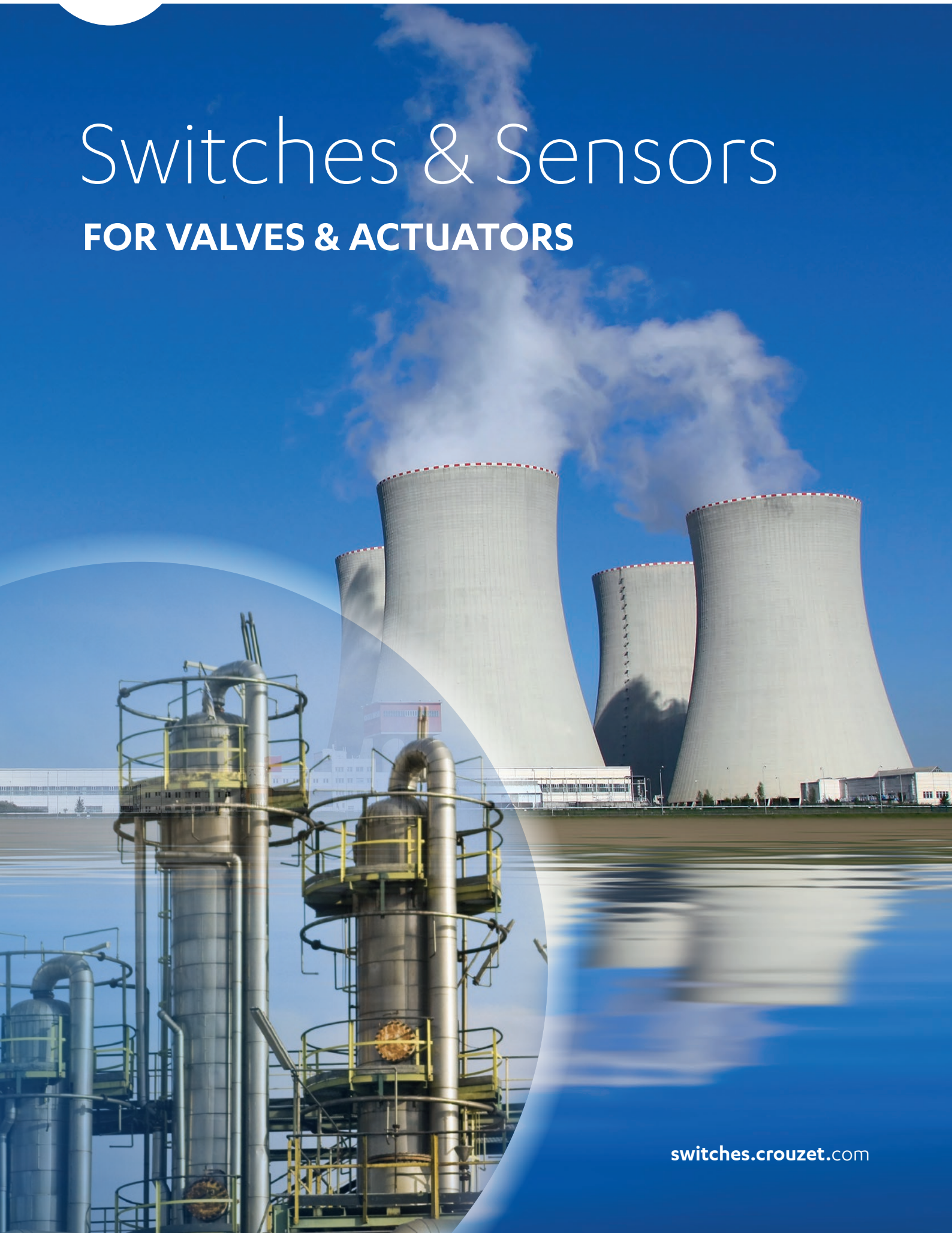
CROUZET

SWITCHES AND POSITION SENSORS

Switches & Sensors

FOR VALVES & ACTUATORS



switches.crouzet.com

ABOUT CROUZET

Since 1921, Crouzet has been committed to designing, manufacturing and supplying efficient components for automated systems to serve a wide range of applications in the **Aerospace & Defense** market and in many Industrial equipment market with a specific focus on application such as **Access control**, **Railway**, **Nuclear** and **Industrial valves** markets.

Crouzet's product lines include standard and specialized **Automation** & **Control** devices, **Motion** products, **Switches** & **Position Sensors**, **Cockpit Controls** & **Electrical Protection** solutions.

Crouzet has a heritage of close collaboration with its customers in the development of adapted products to fully customized solutions.

Driven by innovation and customer satisfaction our teams are focused on delivering the right products for the right application, always meeting, often exceeding customers' expectations of quality, reliability and performance.

INNOVISTA SENSORS

InnoVista Sensors™ is a worldwide industrial specialist of sensors, controllers and actuators for automated systems.

Through its brands, Crouzet and Systron Donner Inertial, InnoVista Sensors™ offers a wide range of reliable, efficient and customizable components dedicated to the Aerospace & Defense, Transportation and Industrial markets and segments.

Thanks to the recognized expertise of its teams and a strong innovation policy, InnoVista Sensors™ brings performance enhancing solutions to its customers worldwide.

InnoVista Sensors™: your trusted partner of choice to face industrial challenges of today and tomorrow.

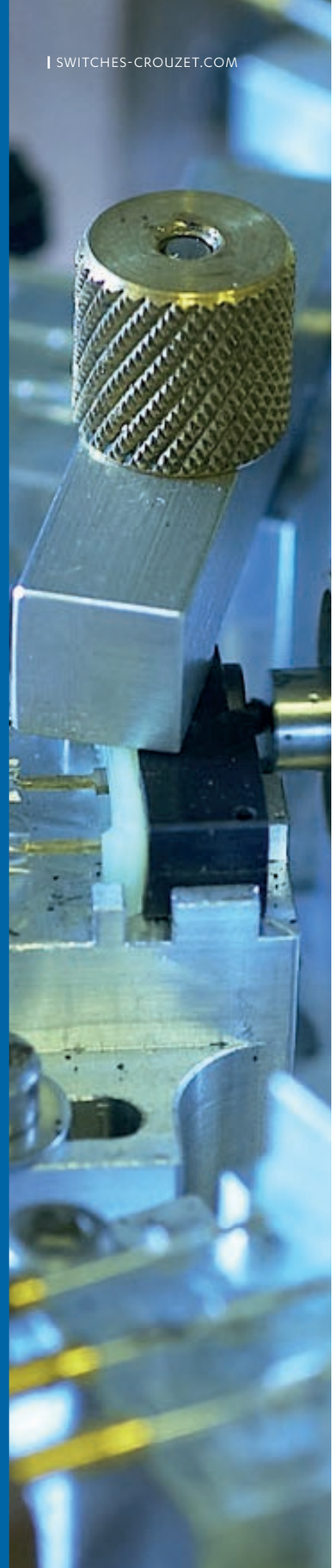
www.innovistasensors.com

Designs & Manufactures

Sensors | Controls | Actuators

For

Aerospace & Defense | **Transportation** | **Industry**



PROVEN MARKET EXPERTISE

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

STRONG PARTNERSHIPS

More than 60 wordwide manufacturers of valves & actuators have placed their trust in Crouzet's epxertise and performance.

QUALITY

To support valves and actuators demanding market, Crouzet puts in place and maintains the highest level of quality approval:

› ISO 9001, ISO 14001

› **EDF certified**

› ATEX, IECEx

› OHSAS 18001

TEST LABORATORY

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

The Crouzet 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 UL standards for microswitches.

› SMT (Supervised Manufacturer's Testing) by Laboratoire Central des Industries Electriques (LCIE) for electrical tests in accordance with EN/IEC standards for microswitches.

THE CROUZET OFFER
FOR VALVES & ACTUATORS

With a presence in the valves field, Crouzet 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 (AG**/K1/K2 K3AD**/K3 & K3ATEX) complying with RCC-E and IEEE-KBE regulations.

** Certification on going

"The application areas require very high quality levels. Crouzet products comply with the national and international standards and certifications."

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, VDE
831607	V3 miniature microswitch with positive opening action	cULus, CCC*
83170	V4 standard subminiature microswitch	cULus, VDE
83181	V4 sealed subminiature microswitch	cULus, VDE
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

8399 Nuc	**Nuclear family**	CCC*
	SP9162 limit switch stainless steel	CCC*
	SP4522 limit switch aluminium or bronze	CCC*
	SP4816 limit switch stainless steel	CCC*
	SP4863 limit switch aluminium	CCC*
	SP4813 limit switch, cylindrical	CCC*
	SP3991 limit switch	Ex

MICROSWITCHES FOR NUCLEAR ENVIRONMENTS

83151	Hermetically sealed microswitch	CCC*
83160	V3 miniature microswitch for radiation	

* Approval pending

DETECTION **FOR INDUSTRIAL APPLICATIONS**

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.

DETECTION/SWITCHING FOR ELECTRIC VALVE ACTUATORS

For electric geared motors, Crouzet offers mainly the 83139 microswitch and its variants.

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
› Special format and variety of fixings

831395
low temperature

831392
double insulated

831398
2-pole with synchronized switching

“Crouzet’s microswitches and limit switches ensure correct fluid flow in any type of industrial valve.”

DETECTION/SWITCHING FOR POSITIONING UNITS

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

Crouzet 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

83106

83133

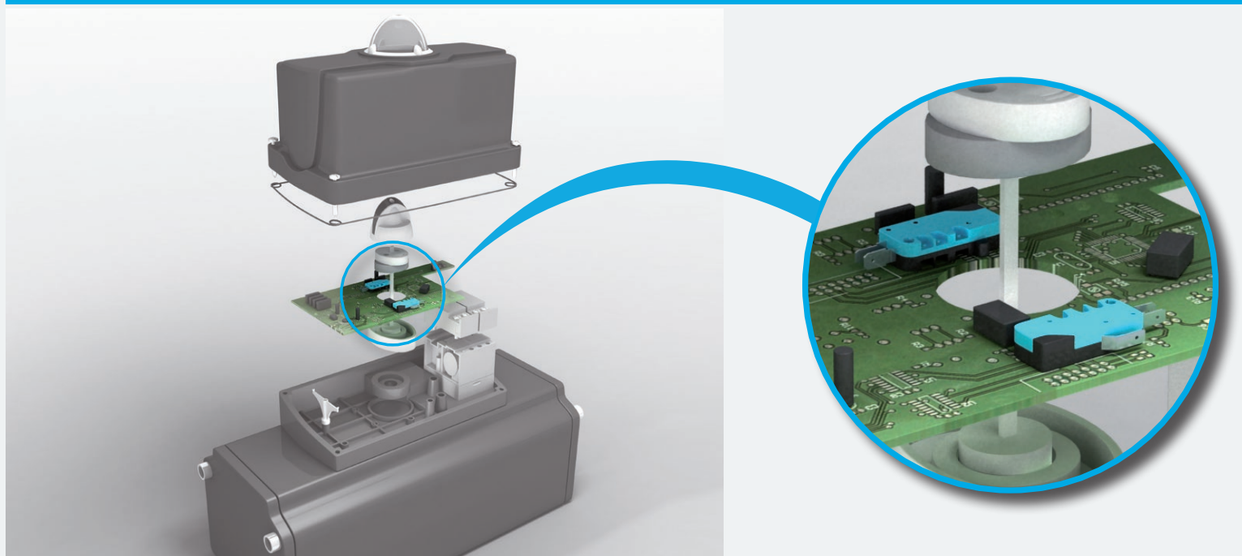
V3 83161

83181

83170

83200

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



DETECTION **FOR EXPLOSIVE ATMOSPHERES**

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

- 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

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.

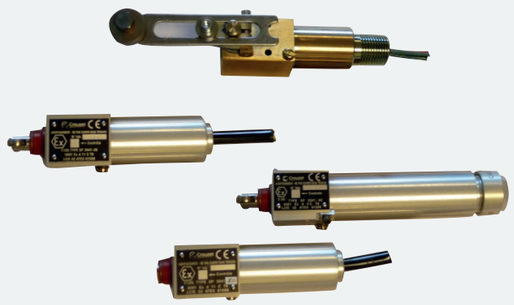
8399 Ex LIMIT SWITCHES FOR EXPLOSIVE ATMOSPHERES

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

› **Certification**
ATEX certified by: LCIE 02 ATEX 6159X and marked:
CE 0081 II 2 G Ex d IIC T(*) Gb
-40 °C < Ta < +210 °C

IECEx certified by: IECEx LCIE 14.0032X and marked:
Ex d IIC T(*) Gb
-40 °C < Ta < +125 °C

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



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

"The limit switches are comprised of a hermetically sealed microswitch (83151) which comines a snap-action switching system with a high degree of resistance to shock and vibration."

DETECTION/SWITCHING FOR ATEX ELECTRIC VALVE ACTUATORS

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

› IP 67

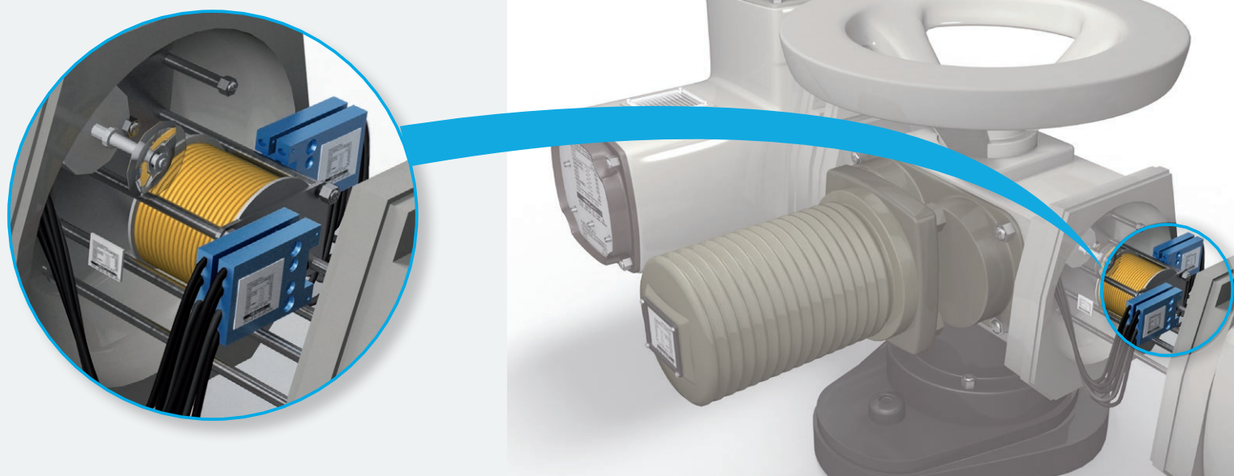
Ex II 2 G Ex d IIC Gb

› 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

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



DETECTION **FOR NUCLEAR ENVIRONMENTS**

Designed to detect positions and switch high or low currents in the most severe conditions, Crouzet's switches work in various applications inside and outside the reactor building.

With more than 40 years' experience in the nuclear industry, Crouzet offers a range of special limit switches classified as Electrical Safety Systems and certified in accordance with RCC-E and IEEE-KBE regulations.

MICROSWITCH & LIMIT SWITCHES FOR VALVE MOTORIZATION

83160 limit switch

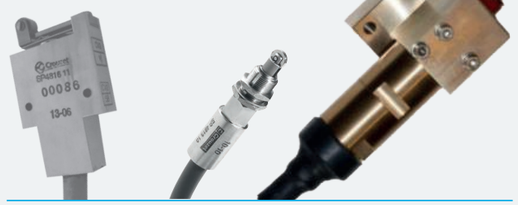
- Screw Connections
- Radiation resistance
- Seismic resistance 8 g
- Temperature -20 °C → 130 °C

SP 4863 limit switch

- Mechanically very robust
- Flexible roller lever fixed to the body
- High seismic resistance
- Operating temperature -55 °C → +105 °C

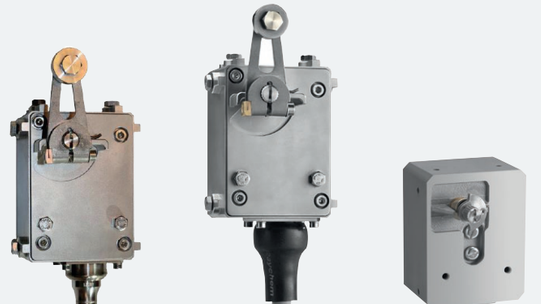
POSITION DETECTION ON THE MAIN VALVE SHAFT IN K1/K2/K3 ENVIRONMENTS

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



SP4816 K1 *SP4743* *S3991 K3 ATEXs*

- Mechanically very robust with stainless steel body
- Plunger or roller lever that is spring returned to rest position, providing excellent resistance to vibration



SP9162 AG *SP9162 K1-K2* *SP4522 K3AD - K3 limit switches*

- Single-pole or 2-pole circuit
- Lever adjustable over 360°
- Connector or cable outputs
- CW / CCW actuation

CLASSIFICATION SUMMARY

FAMILY 8399Nuc & 8399Nuc Ex

Type	RCC-E 2012	RCC-E 2005	IEEE-KBE	Immersible	ATEX
SP916200 → 09*	AG				
SP916210 → 90*	K1-K2				
SP452210 & 20		K1			
SP452250 & 60		K3			
SP452255 → 99*	K3AD-K3				
SP4816		K1			
SP4863		K3			
83999033 → 039			Seism & LOCA		
SP4743				15 m under water level	
SP3991	K3				LCIE 14 ATEX 3035 X

** Certification on going*

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

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