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 markets with a specific focus on applications such as Access control, Railway, Nuclear and Industrial valves markets.

Crouzet’s product lines include Automation & Control devices, Motion products, Switches & Position Sensors, Cockpit Controls & Electrical Protection solutions.

Crouzet has a heritage of close collaboration with 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 and services for the right application, always meeting, often exceeding customers’ expectations.

Crouzet is your trusted partner of choice to face industrial challenges of today and tomorrow.

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
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 worldwide manufacturers of valves & actuators have placed their trust in Crouzet’s expertise 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 electrical 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.
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

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>83106</td>
<td>Double break bi-stable microswitch</td>
</tr>
<tr>
<td>83133</td>
<td>Double break bi-stable microswitch</td>
</tr>
<tr>
<td>83161</td>
<td>V3 standard miniature microswitch</td>
</tr>
<tr>
<td>831607</td>
<td>V3 miniature microswitch with positive opening action</td>
</tr>
<tr>
<td>83170</td>
<td>V4 standard subminiature microswitch</td>
</tr>
<tr>
<td>83181</td>
<td>V4 sealed subminiature microswitch</td>
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<tr>
<td>83200</td>
<td>V5 sealed sub-subminiature microswitch</td>
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<tr>
<td>831395</td>
<td>Low temperature sealed double break microswitch</td>
</tr>
<tr>
<td>831392</td>
<td>Double insulated sealed double break microswitch</td>
</tr>
<tr>
<td>831388</td>
<td>2-pole synchronised switching microswitch</td>
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</table>

LIMIT SWITCHES FOR EXPLOSIVE ATMOSPHERES

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>831391</td>
<td>Sealed double break microswitch</td>
</tr>
<tr>
<td>8399 Ex</td>
<td>Family</td>
</tr>
<tr>
<td>83941</td>
<td>Aluminium &amp; bronze limit switches</td>
</tr>
<tr>
<td>83969</td>
<td>Aluminium &amp; bronze limit switches</td>
</tr>
<tr>
<td>83990</td>
<td>Stainless steel limit switch</td>
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</table>

LIMIT SWITCHES FOR NUCLEAR ENVIRONMENTS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>8399 Nuc</td>
<td>Nuclear family</td>
</tr>
<tr>
<td>83962</td>
<td>Limit switch stainless steel</td>
</tr>
<tr>
<td>84522</td>
<td>Limit switch aluminium or bronze</td>
</tr>
<tr>
<td>84816</td>
<td>Limit switch stainless steel</td>
</tr>
<tr>
<td>84863</td>
<td>Limit switch aluminium</td>
</tr>
<tr>
<td>84813</td>
<td>Limit switch, cylindrical</td>
</tr>
<tr>
<td>83991</td>
<td>Limit switch</td>
</tr>
</tbody>
</table>

MICROSWITCHES FOR NUCLEAR ENVIRONMENTS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>83151</td>
<td>Hermetically sealed microswitch</td>
</tr>
<tr>
<td>83160</td>
<td>V3 miniature microswitch for radiation</td>
</tr>
</tbody>
</table>

* 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

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

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

Crouzet’s microswitches and limit switches ensure correct fluid flow in any type of industrial valve.
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:
    - C E 0081 II 2 G 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.

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
- 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

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

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

Position Detection

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

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

CLASSIFICATION SUMMARY

<table>
<thead>
<tr>
<th>Family 8399 Nuc &amp; 8399 Nuc Ex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>SP916200 → 0°</td>
</tr>
<tr>
<td>SP916210 → 90°</td>
</tr>
<tr>
<td>SP452210 &amp; 20</td>
</tr>
<tr>
<td>SP452250 &amp; 60</td>
</tr>
<tr>
<td>SP9162255 → 99°</td>
</tr>
<tr>
<td>SP4863</td>
</tr>
<tr>
<td>83999033 → 039</td>
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<tr>
<td>SP4743</td>
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<tr>
<td>SP3991</td>
</tr>
</tbody>
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* Certification on-going
### Warning:
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