

MANUFACTURING THE FUTURE

Of Nuclear Power Plants



ABOUT CROUZET

Crouzet is an independent company **manufacturing mechatronic components for demanding applications in Aerospace & Transportation, Energy, Building and Machinery Industry.**

Crouzet provides **Switches and Sensors, Electromechanical Actuators, Electrical Protection Equipment, Cockpit Controls, Automation Controllers and Relays, and Instrumentation Services.**

Since 1921, Crouzet has a heritage of close collaboration with customers in the development of products, from standard components to fully customized solutions.

Crouzet's customers and partners can rely on our teams worldwide to always meet and often exceed their expectations. Driven by innovation, our experts are focused on designing and delivering the right product for the right application.

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

WORLDWIDE PRESENCE



📍 HEADQUARTERS

■ SALES OFFICES

CROUZET IN THE NUCLEAR SECTOR

With more than 40 years' experience in the nuclear industry, we are committed to delivering solutions to improve the safety of nuclear sites.

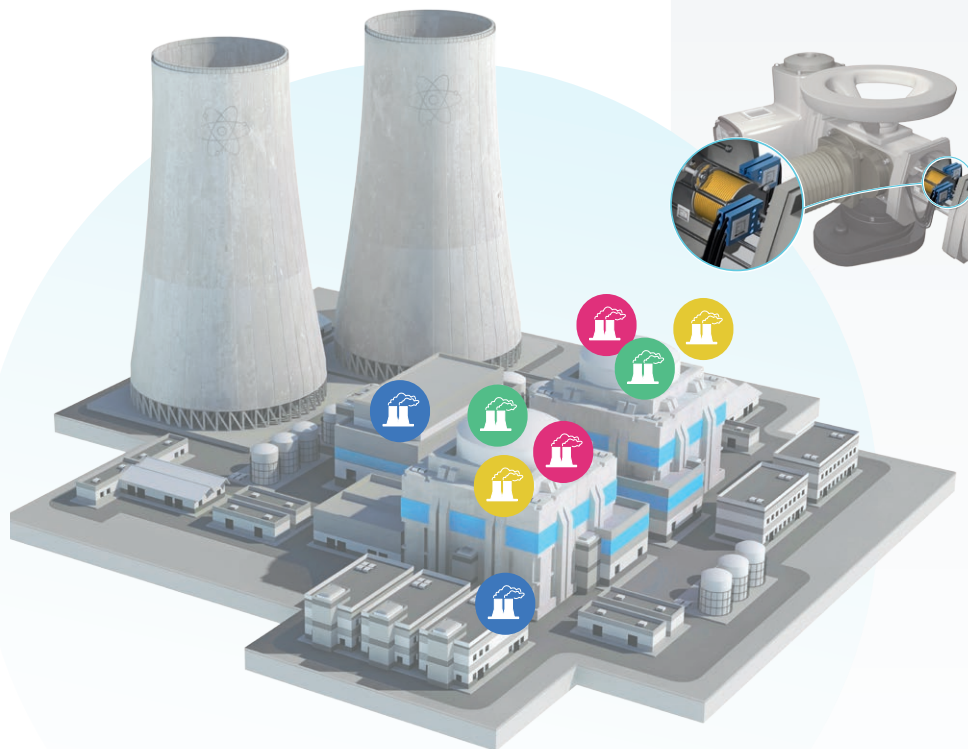
- › 100000 Nuclear Switches
- › Proven Performance & Safety
- › Worldwide presence in more than 40 Nuclear Power Plants
- › RCC-E (AG, K1/K2/K3, K3AD), IEEE/KBE

“Designed to detect positions and switch high or low currents in the most severe conditions, Crouzet's switches are solutions where failure is not an option.”

HIGH PERFORMANCE INSIDE & OUTSIDE OF THE REACTOR BUILDING

Crouzet's microswitches, limit switches & sensors withstand the most challenging **AG, K1, K2, K3AD, K3 ATEX, K3** environments to switch current and detect position of:

- › Main valve shaft
- › Motorized valve actuators
- › Hoists
- › Gates
- › Generators
- › Safety guards
- › HVAC



AG CATEGORY

Equipment required to perform its function under severe accidents.



K1 CATEGORY

Equipment required to perform its function under normal service conditions, earthquake, normal service radiation, accidental and post-accidental conditions.



K2 CATEGORY

Equipment required to perform its function under normal service conditions, normal service radiation and earthquake.



K3, K3 ATEX, K3AD CATEGORY

Equipment required to perform its function under normal conditions and earthquake.

NUCLEAR SWITCHES

QUALIFIED PRODUCTS

	HARSH ENVIRONMENTS												MILD ENVIRONMENTS			
	WITH ACCIDENT CONDITIONS*						WITHOUT ACCIDENT CONDITIONS**									
																
Aprox. body size (mm)	Ø31x148	94x22x22	90x70x50	90x70x50	64x35.5x12.8	90x70x50	90x70x50	90x70x50	90x70x50	160x46x45	90x70x50	42x36x13	Ø15x63	Ø16x97	Ø11x15	28x16x10
TYPE	83999033 → 03X	83999036	SP916200 → 09	SP916210 → 40	SP481611	SP452210 & 20	SP916250 → 80	SP452255 → 59	SP452252 → 99	SP3991	SP452250 & 60	SP4863	SP4813	SP 4743	83151*	83160
Typical applications	Valves	Valves	Safety Valves	Regulation Valves	HVAC Dampers & Actuators	Regulation Valves	Valves	Steam Valves	Regulation Valves	ATEX Valves	Valves	Actuators & generators	Overhead Crane	Underwater Detection	High Precision	Detection in Valve actuator
Voltage - Current - Power factor	110 V~ / 50 mA		29 V~ - 1.5 A - L/R: 5 ms 137 V~ - 200 mA - L/R: 40 ms				29 V~ - 3 A - Resistive 220 V~ - 400 mA - Cos: 0.8				48 V~ - 1 A - L/R: 5 ms 220 V~ - 1 A - Cos: 1				220 V~ 1A 0.4A cos: 0.8 29V~ 3A 1.5A L/R5 ms 250V~ 0.3A 48V~ 2A	220 V~ 1A 0.4A cos: 0.8 29V~ 3A 1.5A L/R5 ms 250V~ 0.3A
Circuit diagram																
Number of poles	1	1	1	1	1	1 or 2	1	1 or 2	1 or 2	1	1 or 2	1	1	1	1	1
Degree of protection	IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	IPX7	IP67	IP67	IP65	IP68	Hermetic	IP40
Temperature range min. & max.	+5 °C +200 °C	+5 °C +200 °C	+10 °C +53 °C	+10 °C +53 °C	-55 °C +105 °C	+10 °C +53 °C	+10 °C +53 °C	-25 °C +175 °C	-25 °C +55 °C	-20 °C +60 °C	+10 °C +53 °C	-55 °C +105 °C	-25 °C +80 °C	-15 °C +60 °C	-55 °C +250 °C	-40 °C +150 °C
Radiation level (KGy)	114	114	1950	500	850	850	500	250	50				200	1000	1000	2200
Operating force max. (N)	54	54	29	29	30	35	29	29	29	20	35	8.5	12	25	25	5
Differential travel max. (mm)	0.10	0.10	1	1	0.3	1	1	1	1	0.08	1	0.5	0.05	0.05	0.06	0.3
Housing material	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Bronze	Stainless Steel	Aluminium	Aluminium	Bronze	Aluminium	Aluminium	Stainless Steel	Austenitic Steel	Stainless Steel	Plastic
Weight without cable (g)	200	200	1020	1010	130	1400	1010	650	650	640	550	42	60	80	10	10
Mechanical life (cycles)	11 000	8 000	20 000	100 000	50 000	30 000	100 000	20 000	100 000	100 000	30 000	50 000	100 000	100 000	200 000	10 000 000
Connections	Connector		•	•	•	•	•	•	•	•	•	•	•	•	solder	screw
	Cable	•		•	•	•	•	•	•	•	•	•	•	•		
	Wires		•									•			•	•
Approvals																
Nuclear qualification	LOCA	LOCA	AG	K1 Ambience 6	K1	K1	K2	K3AD family C+F	K3 family C+F	K3 / ATEX	K3	K3	Qualification in customer application			
Nuclear standard	IEEE/KBE	IEEE/KBE	RCC-E 2012	RCC-E 2012	RCC-E-2005	RCC-E-2005	RCC-E 2012	RCC-E 2012	RCC-E 2012	RCC-E 2012	RCC-E-2005	RCC-E-2005				

* (LOCA, Radiation and Seismic Resistant) ** Radiation and Seismic Resistant
The value of the technical characteristics may change.

CUSTOMER BENEFITS

Safety & Security

- › Robust products compliant to the nuclear standards
- › Regular quality tests in laboratories
- › Expertise built up through long lasting partnerships with the leading nuclear manufacturers from France & China

Close Collaboration

- › Convenience & time saving
- › Best practices shared
- › Flexibility & improved stability

Product Customization

- › Meet specific needs more closely
- › Customer satisfaction
- › Production on demand
- › Replacement of obsolete limit switches



AMERICAS

CANADA

Tel.: +1 (855) 929-5465
americas.custserv@crouzet.com

MEXICO

Tel.: +1 (855) 929-5465
americas.custserv@crouzet.com

USA

+1 (855) 929-5465
americas.custserv@crouzet.com

COUNTRIES NOT LISTED

+1 (855) 929-5465
americas.custserv@crouzet.com

EUROPE / MIDDLE EAST / AFRICA

BELGIUM

Tel.: +32 (0) 2 620 06 05
Fax: +32 (0) 2 461 00 23
klantenservice@crouzet.com

FRANCE

Tel.: +33 (0) 475 802 101
Fax: +33 (0) 475 828 900
relationclient@crouzet.com

GERMANY / AUSTRIA

Tel.: +49 (0) 2103/9385930
Fax: +49 (0) 2103/980-222
kundenservice@crouzet.com

ITALY

Tel.: +39 (02) 38 594 099
Fax: +39 (02) 82 952 104
assistenzaclienti@crouzet.com

SPAIN / PORTUGAL

Tel.: +34 (91) 215 80 95
Fax: +34 (93) 2 20 02 05
atencionalcliente@crouzet.com

SWITZERLAND

Tel.: +41 (0) 225 67 57 90
Fax: +41 (0) 565 88 02 75
kundenservice@crouzet.com

THE NETHERLANDS

Tel.: +31 (0) 20-654 52 20
klantenservice@crouzet.com

UNITED KINGDOM

Tel.: +44 (0) 2076 600 025
customer.relation@crouzet.com

COUNTRIES NOT LISTED

Tel.: +33 (0) 475 802 102
Fax: +33 (0) 475 828 900
customer.relation@crouzet.com

ASIA / PACIFIC

CHINA

Tel.: +86 (75) 2 5303 200
china@crouzet.com

INDIA

india@crouzet.com

SOUTH KOREA

Tel.: +82 (2) 2679 8312
Fax: +82 (2) 2679 9888
korea@crouzet.com

EAST ASIA PACIFIC

Tel.: +86 (21) 8025 7177
Fax: +86 (21) 6107 1771
eap@crouzet.com

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