

## Piezo Switches Specifications

Mechanical properties					
					Comments
Dimensional tolerance	According to tolerances given on Danielson drawings				Laser / die cutting +/- 0.2mm
Operation force	Typically between 2 - 10 N				Danielson Mosfet interface, 0,5 mm aluminium front ASTFM F1597-02
<b>Tactile feedback with</b>	Rubber pad		Membrane layer		Comments
Key travel distance	0.6 mm		0.3 mm		ASTM F1682-02
Actuation life	> 500k		> 1 million		
<b>Front overlay aspects</b>	Aluminium front	Stainless steel front	Polycarbonate front	Polyester front	Comments
Actuation life	> 50 million	> 50 million	> 1 million	> 1 million	ASTM F1578-01 @ ambient conditions (20°, 50% RH)
Emboss height	≤ 0.5 mm *	≤ 0.5 mm *	N.A.	≤ 0.5 mm **	
<b>Connection</b>	No interface: Flex foil		PCB		Comments
Connector	Crimpflex		Cable, header, picoflex, Zif, other		
Cable length	Between 50 mm and 150 mm		Minimum 50 mm - no maximum		Depending on EMC requirements
Bend radius	Minimum 4.0 mm		Cable depending		

\* Braille embossing

\*\* Rim embossing

Environmental properties		
		Comments
Operating temperature	-20°C to +85°C at 50% RH	IEC 60068-2-14, 3 hours, 6 times
Storage temperature	-20°C to +85°C	IEC 60068-2-14, 3 hours, 6 times
<b>Other properties</b>		
Operating humidity	≤ 90%RH Without dew condensation	IEC 60068-2-30, 9 hours, 2 times
Storage humidity	≤ 90%RH Without dew condensation	IEC 60068-2-30, 9 hours, 2 times
<b>Shielding &amp; protection</b>		
Ingress Protection (IP)	IP65	IEC 60529:2001; Sealing to IP68 can be achieved; subject to design considerations
Electromagnetic Shielding	Metal front and carrier earthing; other shielding solutions are available from Danielson to meet your EMC and ESD requirements	

Electrical properties					
	On metal carrier	Circuitry on / off (mosfet)	Circuitry on / off duration (mosfet)	Circuitry matrix	Comments
Contact bounce time	30 ms*	30 ms*	30 ms*	30 ms*	ASTM F1661-09
Maximum activation time	0.25 s	0.2 s	35 s	0.2 s	≥ 5 Newton
Maximum "On" resistance	Interface depending	≤ 10 Ω	≤ 10 Ω	500 Ω** @ 10 V 1050 Ω* @ 5 V	
Insulation resistance	≥ 10MΩ	≥ 10MΩ	≥ 10MΩ	≥ 10MΩ	ASTM F1689-02
Operating (switched) voltage	Interface depending	100 V	100 V	18 V	
Operating (switched) current	Interface depending	≤ 500 mA	≤ 500 mA	≤ 25 mA	
Operating (switched) power	Interface depending	≤ 50 W	≤ 50 W	≤ 450 mW	Calculated for resistive circuit
Threshold Voltage	4 V*	23 V @ 24 V supply, 100 mA	23 V @ 24 V supply, 100 mA	2,75 V @ 5V	Danielson test setting, 0.5 mm aluminium, 5 N
Typical quiescent power consumption	0 W	0 W	0 W	≤ 0,00025 mW per 4 buttons	

\* Danielson interface is optionally bounceless

\*\* typically 1/4th of maximum

*Danielson can incorporate a wide range of features into a Piezo Switch panel.*

Piezo Switch design options and Features	
Key features	Piezo Switches are: <ul style="list-style-type: none"> <li>- Robust</li> <li>- Longlasting</li> <li>- Liquid and dust resistant</li> <li>- Extremely flexible and limitless design options</li> </ul>
Other features	Other integrable features: <ul style="list-style-type: none"> <li>- Seamless integration</li> <li>- Adjustable response</li> <li>- Large choice of (front) materials</li> <li>- No moving parts</li> <li>- Sealable up to IP65</li> </ul>