



# Valmark Industries, Inc.

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## MEMBRANE SWITCH *General Specifications*

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All membrane assemblies and graphic overlays supplied by Valmark Industries are: close-tolerance, micro-motion electrical switches and/or thin-gauge plastic graphic products. However, because each part we provide is custom, each of the characteristics below can be, to greater or lesser extent, customized to a particular application. The following is a set of *typical* membrane switch specifications that Valmark can provide:

### Mechanical

<u>Characteristic</u>	<u>Typical Values</u>	<u>Test Method</u>
1. Life – Operations:	100k to 5 million (max)	IAW ASTM F1578
2. Actuation Force:	2 oz. to 32 oz.	IAW ASTM F1597
3. Travel:	0.003" to 0.100"	IAW ASTM F1682
4. Bend:	1.0"R, 10-20 cycles	IAW ASTM F1683
5. Crease:	1 to 5 cycles	IAW ASTM F1683

### Electrical

<u>Characteristic</u>	<u>Typical Values</u>	<u>Test Method</u>
1. Closed Loop Resistance:	$\leq 100\Omega$	IAW ASTM F1680
2. Open Loop Resistance:	$>10M\Omega$	IAW ASTM F1680
3. Insulation Resistance:	$>10M\Omega$	IAW ASTM F1689
4. Dielectric Withstand:	250VDC – 1k VDC	IAW ASTM F1662
5. Contact Bounce:	$\leq 10ms$	IAW ASTM F1661
6. Volume Resistivity:	$>10^{15} \Omega\text{-m}$	IAW ASTM D257 (for PFC layer only)
7. Dielectric Constant:	2.9	IAW ASTMD150 (for PFC layer only)

### Environmental

<u>Characteristic</u>	<u>Typical Values</u>	<u>Test Method</u>
1. Temperature – Operational:	0 °C to +65 °C	IAW ASTM F1596 Level 4
Temperature - Storage:	-40 °C to +85 °C	IAW ASTM F1596 Level 1
2. Humidity:	0 – 95% RH (NC)	IAW ASTM F1596 Level 4
3. Shock:	50 (g for 11 ms)	IAW MIL-STD 810E Method 516.4
4. Vibration:	10 (g 10 through 2kHz)	IAW ASTM F2188
5. Altitude:	0 to 40,000 ft. (vented)	IAW ASTM F1762

**Note:** Inasmuch as Valmark Industries, Inc. has no control over the use to which others may put these materials and assemblies, it does not guarantee that the same results as those described herein will be obtained. Nor does Valmark Industries, Inc. guarantee the effectiveness or safety of any possible or suggested design for articles of manufacture as illustrated herein by any photos, technical drawings and the like. Each OEM user of our products or design or both should make his own tests to determine the suitability of the materials, finished products, or any materials for the design, as well as the suitability of the materials, products and/or design for his own particular application.