Nelson Nameplate

Reference Testing: Single Circuit Switch with Stainless Steel Domes

TECHNICAL DATA SHEET MAY 2000

Life Cycle Testing

Life Cycle Testing Data

Selected switch positions are cycled for a total of ten million (10,000,000) cycles. Actuation force and closure resistance are measured per ASTM F 1597-95 *Standard Test method for Determining the Actuation Force and Contact Force of a Membrane Switch* and ASTM F 1680-96 *Standard Test Method for Determining Circuit Resistance of a Membrane Switch.* The condition of the graphic overlay is also measured and is recorded periodically.

Life Cycle Test Results

Keys #1, #2, and #3 were tested. Closure resistance varied between the three keys from 6.1 to 8.1 ohms +/-0.3 ohms and the actuation force decreased an average of 65 grams during the test. All three keys showed slight ink delamination in the areas that were being flexed after approximately 300,000 cycles. These areas continued to increase in area and number until approximately 4,000,000 cycles after which there were no significant changes. On two of the three keys, ink separation was noted after 1,000,000 cycles. The travel decreased on average .06 mm and the insulation resistance remained above 1.4×10^{11} ohms.

Environmental Testing

Environmental Testing Procedure

Common circuits are connected together with a 35 VDC potential applied across the open contact through 18K-ohm current limiting resistors. The switches are subjected to temperature and humidity per ASTM 1596-95 Level 2 *Standard Practice for Exposure of Membrane Switches to Temperature and Relative Humidity.* Pretest and posttest measurements were taken of the switch travel, actuation force, contact force, circuit resistance, and the insulation resistance. Each of these measurements has a corresponding ASTM standard that was used in determining the results of the tests.

Environmental Test Results

Initial insulation resistance readings were all greater than 1×10^{11} ohms. After the ten day exposure to temperature and humidity per ASTM 1596-95 Level 2, all readings were greater than 3.6×10^{10} ohms. There was no silver migration. All other parameters remained virtually unchanged.

Construction Detail

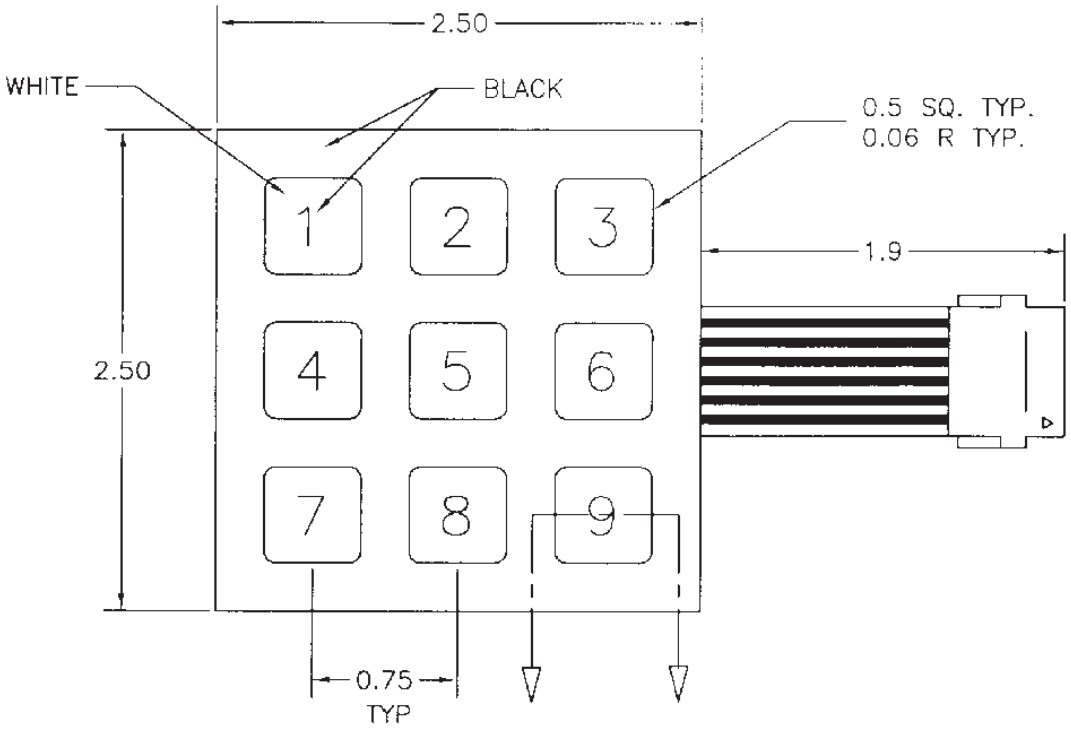
See Construction Graphic E for construction detail.

For Additional Data

Please contact us to discuss your potential application needs or to receive detailed test data.

Nelson Nameplate Company
2800 Casitas Ave.
Los Angeles, CA 90039-2942
323/663-3971 Phone
323/661-2137 Fax
Or visit us on the Web at www.nelsonUSA.com

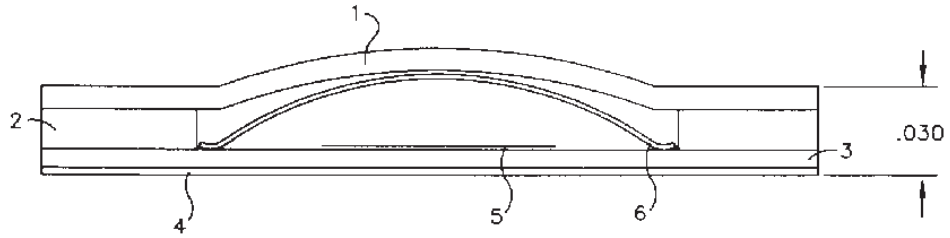
REVISION			
REV.		DATE	APPROVED



CIRCUIT DETAIL MODIFIER	
1	EXTERNALLY VENTED
2	CROSSOVERS
3	BIFURCATED W/ SHUNTS

NOTE: DEFAULT DESIGN USES INTERNAL VENTING, NO CROSSOVERS.

1. .006 AUTOTEX 2 V6 (OVERLAY)
2. .011 3M 7961 (SPACER)
3. .005 ICI MELINEX 561 POLYESTER (BOTTOM CIRCUIT)
4. .002 3M 7952 (ADHESIVE)
5. .0003 725A (SILVER INK)
6. 4L-12.2S-3.8F-N (W.L. DOME)



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES .XX = ±.010 .XXX = ±.005	APPROVALS	DATE	Nelson Nameplate 2800 CASITAS AVENUE LOS ANGELES, CA 90039 (323) 663-3971
MATERIAL	DRAWN SHANE MAST	8/9/99	TEST SAMPLE
	CHECKED		CONSTRUCTION – E –
FINISH			METAL DOME – TACTILE SWITCH
DO NOT SCALE DRAWING			SIZE A; SCALE 1=1; FILE # TESTCONS.DWG; SHEET 1 OF 1