Nelson Nameplate

Reference Testing: Stainless Steel Domes on a Two Circuit Switch

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

Key #1 was tested. Closure resistance remained between a high of 32 ohms and a low of 6.9 ohms throughout the test. The maximum actuation force varied during the test with a high of 422 grams and a low of 381 grams. The initial value was 413 grams and the final was 410 grams. The key showed slight ink delamination in the areas that were being flexed after approximately 539,000 cycles. The areas of delamination continued to form around three sides of the spacer cavity at 1,500,000 cycles and at 4,250,000 cycles the areas formed around the entire spacer cavity. No significant changes were noted for the remainder of the test.

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.* Pre and post test 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 D for construction detail.

For Additional Data

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

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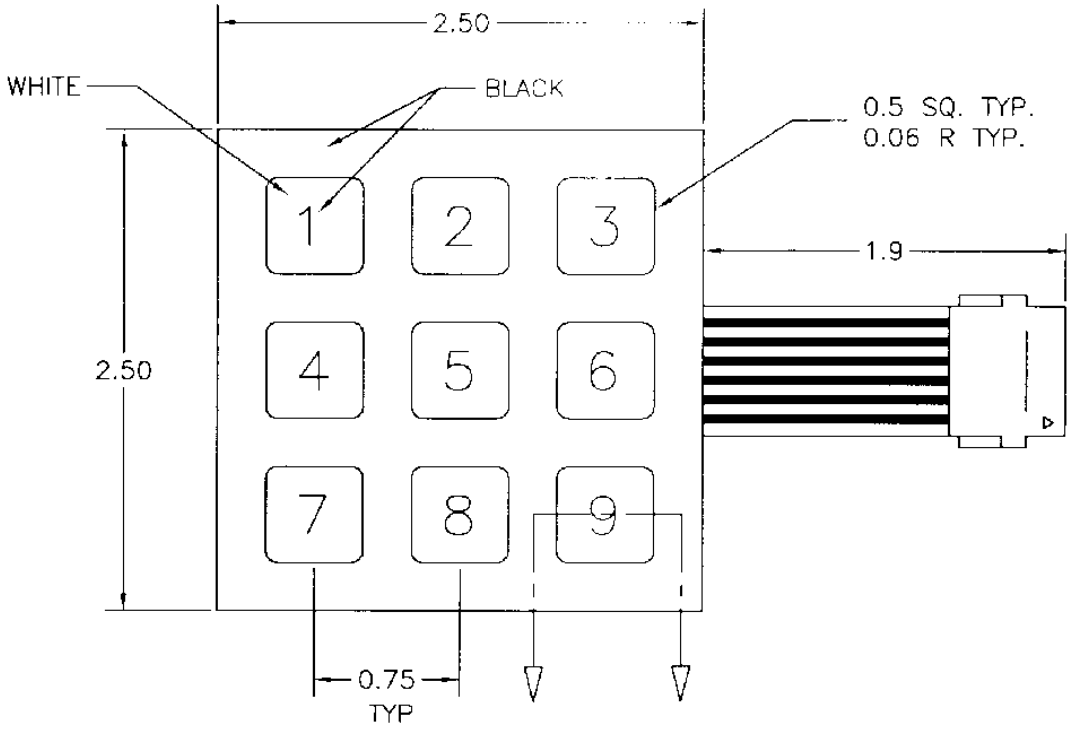
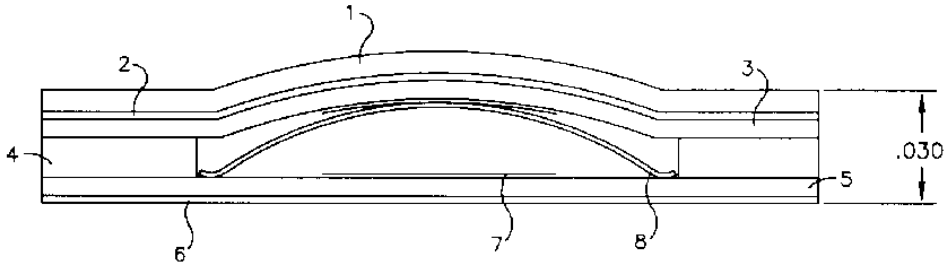
REVISION			
REV.		DATE	APPROVED



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. .002 3M 7952 (GRAPHICS ADHESIVE)
3. .005 ICI MELINEX 561 POLYESTER (TOP CIRCUIT)
4. .011 3M 7961 (SPACER)
5. .005 ICI MELINEX 561 POLYESTER (BOTTOM CIRCUIT)
6. .002 3M 7952 (ADHESIVE)
7. .0003 725A (SILVER INK)
8. 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

MATERIAL

FINISH

DO NOT SCALE DRAWING

APPROVALS	DATE
DRAWN SHANE MAST	8/9/99
CHECKED	

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TEST SAMPLE
CONSTRUCTION – D –
METAL DOME – TACTILE SWITCH

SIZE A | SCALE 1=1 | FILE # TESTCONS.DWG | SHEET 1 OF 1