DISTINCTIVE CHARACTERISTICS

- Nonilluminated options in 4 or 16 keys, illuminated choices in 12 or 16 keys
- 1.0mm (.039") tail pitch
- Easily integrated into designs: replaces multiple mechanical switches, soldered wires and cable assemblies
- Card insertion into design supports customized legends for nonilluminated models
- Actuating dome offers crisp, tactile feedback to positively indicate circuit transfer
- Illuminated models feature legends on embossed keypads
- Adhesive backing for easy mounting

GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Level</td>
<td>20mA @ 24V DC</td>
</tr>
<tr>
<td>Contact Resistance</td>
<td>5000Ω maximum (10mA @ 10V DC)</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>100 megohms minimum @ 250V DC minimum</td>
</tr>
<tr>
<td>Dielectric Strength</td>
<td>250V AC minimum for one minute minimum</td>
</tr>
<tr>
<td>Operational Life</td>
<td>1,000,000 operations minimum</td>
</tr>
<tr>
<td>Contact Timing</td>
<td>10 milliseconds maximum</td>
</tr>
<tr>
<td>Nominal Operating Force</td>
<td>1.0N ~ 6.0N</td>
</tr>
<tr>
<td>Stroke:</td>
<td></td>
</tr>
<tr>
<td>Nonilluminated</td>
<td>.016” ~ .039” (0.4mm ~ 1.0mm)</td>
</tr>
<tr>
<td>Illuminated with Surface Sheet</td>
<td>.020” ~ .047” (0.5mm ~ 1.2mm)</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>–15°C ~ +50°C (+5°F ~ +122°F)</td>
</tr>
</tbody>
</table>

LED SPECIFICATIONS

<table>
<thead>
<tr>
<th>LED Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Voltage (Typical)</td>
<td>( V_F ) 2.1 V</td>
</tr>
<tr>
<td>Forward Current (Typical)</td>
<td>( I_F ) 20 mA</td>
</tr>
<tr>
<td>Forward Current (Maximum)</td>
<td>( I_{FM} ) 30 mA</td>
</tr>
<tr>
<td>Forward Peak Current (Max)</td>
<td>( I_{FM} ) 195 mA</td>
</tr>
<tr>
<td>Reverse Voltage (Maximum)</td>
<td>( V_R ) 5.0 V</td>
</tr>
</tbody>
</table>

The electrical specifications shown are determined at a basic temperature of 25°C. LED is an integral part of the switch. LEDs are not sold separately.

LED circuits are isolated and require an external power source. If the source voltage exceeds the rated voltage, a ballast resistor is required.

* Note: Pulse width 0.1msec maximum with a maximum duty cycle ratio of 1/10

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Illumination</th>
<th>Number of Keys</th>
<th>Surface Sheet Black (D)</th>
<th>Surface Sheet Gray (E)</th>
<th>Overlay</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMBN04BD</td>
<td>Nonilluminated</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMBN04BE</td>
<td>Nonilluminated</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMBN16BD</td>
<td>Nonilluminated</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMBN16BE</td>
<td>Nonilluminated</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMBP12BF</td>
<td>Dot Illuminated with Overlay</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMBP16BF</td>
<td>Dot Illuminated with Overlay</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

wm.nkksmartswitch.com • Toll Free 1.877.2BUYNKK • Tel 480.991.0942 • Fax 480.998.1435 • Email: smartswitch@nkkswitches.com
Nonilluminated • 4 or 16 Keys

TYPICAL SWITCH DIMENSIONS

Switch Circuit Matrix
For 4 Key

Key numbers in parenthesis are not actually on panel and are for reference only

Switch Circuit Matrix
Detail For 4 or 16 Key

Key numbers in parenthesis are not actually on panel and are for reference only

Insertable Legend Card for 4 Key or 16 Key

Insertable Legend Cards are supplied with the nonilluminated switch keypad assembly in Black, Gray and Yellow

FMBN04BE
with Gray Surface Sheet

FMBN16BD
with Black Surface Sheet

Membrane Switch Keypads Series FM

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TYPICAL SWITCH DIMENSIONS

Illuminated • 12 or 16 Keys

Dot illumination at upper left corner of each keypad

Switch Circuit Matrix
For 12 Key

LED Circuit Matrix
For 12 Key

Key numbers in parenthesis are not actually on panel and are for reference only

Switch Circuit Matrix
For 16 Key

LED Circuit Matrix
For 16 Key

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INSERTABLE LEGEND CARDS

Instructions for Customizing Insertable Legends
The membrane keypad assembly comes with three insertable legend cards: yellow, gray and black. The following provides guidelines for creating and insertion of legend cards for the membrane switch keypad assembly. Read all of the instructions prior to customizing and inserting the legend card.

• Using the borders on the insertable legend card as a guide, be sure characters on the card are about 1.5mm (.059") within these borders. This is the printable area.

• Legend characters may be drawn, printed, etc. Be sure that application choice is completely dry before inserting into membrane keypad assembly.

Instructions for Inserting Legend Card

• Note correct orientation of insertable legend card. Insert card under surface sheet, and use caution to avoid bending the membrane keypad assembly. Do not use pointed object to insert card, and do not remove surface sheet.

• Align and center all legend characters within the squares of the surface sheet.

• Smooth any wrinkles or air pockets from surface sheet.

• Peel off adhesive strip from the membrane keypad assembly.

• The legend card is now firmly in place and cannot be removed.

• Detach the protective film.

Connectors

Recommended Connectors for 5 Pin
Straight:  FCI Part No. SLW5S-5C7LF
Right Angle:  FCI Part No. SLW5R-5C7LF

Recommended Connectors for 8 Pin
Straight:  FCI Part No. SLW8S-5C7LF
Right Angle:  FCI Part No. SLW8R-5C7LF

APPLICATIONS

• Communication equipment
• Office machines
• Electronic equipment for national security

• Automation equipment
• Electronic equipment
• Amusement equipment