NR01 Series

Process Sealed Rotaries

Subminiature Rotaries with Positive, Distinctive Detent
Series NR01 Subminiature Process Sealed Rotaries

General Specifications

Electrical Capacity (Resistive Load)

Logic Level: 0.4VA maximum @ 28V AC/DC maximum
(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
Note: Find additional explanation of operating range in Supplement section

Other Ratings

- Contact Resistance: 100 milliohms maximum
- Insulation Resistance: 100 megohms minimum @ 500V DC
- Dielectric Strength: 500V AC minimum for 1 minute minimum
- Mechanical Life: 30,000 cycles minimum
- Electrical Life: 10,000 cycles minimum
- Nominal Operating Torque: 0.02Nm (0.177 lb•in)
- Contact Timing: Nonshorting
- Indexing: 45° for 3-position, 4-position & 5-position

Materials & Finishes

- Housing: Glass fiber reinforced polyester (PBT)
- Base: Glass fiber reinforced polyamide
- Rotor: Polycetal
- Movable Contactor: Beryllium copper with gold plating
- Stationary Contacts: Phosphor bronze with gold plating
- Terminals: Phosphor bronze with gold plating
- Mounting Bracket: Steel with tin plating

Environmental Data

- Operating Temperature Range: –25°C through +70°C (–13°F through +158°F)
- Humidity: 90 ~ 95% humidity for 96 hours @ 40°C (104°F)
- Vibration: 10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 2 hours
- Shock: 50G (490m/s²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

- Soldering: Wave Soldering Recommended: Preheat temperature 110°C; Preheat time 40 seconds; Peak Temperature 270°C; Peak Time 6 seconds; Thickness of PCB 1.6mm; 2 Cycles.

Standards & Certifications

The NR01 Series rotaries have not been tested for UL recognition or CSA certification. These switches are designed for use in a low-voltage, low-current, logic-level circuit. When used as intended in a logic-level circuit, the results do not produce hazardous energy.

Note: Values are determined by NKK’s individual specification tests in a controlled environment, and do not certify that the product supports simultaneous multiple conditions.
Distinctive Characteristics

Totally sealed construction with internal o-ring, gasket between base and housing, and insert-molded terminals, gives protection for automated processing techniques.

Detent mechanism, with its spring-operated steel ball, gives distinct feel and crisp actuation for accurate switch setting.

Subminiature size and compact body contributes to high density mounting.

Bifurcated, self-wiping contact mechanism provides unequalled logic-level reliability and smoother, positive detent actuation.

Crimped bracket legs ensure secure PCB mounting and prevent dislodging during automated wave soldering.

Molded-in terminals prevent entry of flux and other contaminants.

.100" x .100" (2.54mm x 2.54mm) terminal spacing conforms to standard PC board grid spacing.

Applications

- Power Control Equipment
- Measuring Devices
- Telecommunication Equipment
- Medical Equipment
- Teaching Pendant

Actual Size
Series NR01 Subminiature Process Sealed Rotaries

TYPICAL SWITCH ORDERING EXAMPLE

NR01 1 03 A N G 13 — 1 C

Pole 1 Single Pole

Contact Timing N Nonshorting

Contact Material G Gold Rated 0.4VA @ 28V AC/DC

PC Terminals 13 Straight with Bracket

Colors
A Black
C Red
H Gray

Knobs
No Code Without Knob
1 Knob Without Flange
2 Knob With Flange

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE NR01103ANG13-1C

Circuits, Positions & Indexing

<table>
<thead>
<tr>
<th>Code</th>
<th>Pos. 1</th>
<th>Pos. 2</th>
<th>Pos. 3</th>
<th>Pos. 4</th>
<th>Pos. 5</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>—</td>
<td>—</td>
<td>45°</td>
</tr>
<tr>
<td>04</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>—</td>
<td>45°</td>
</tr>
<tr>
<td>05</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>45°</td>
</tr>
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</table>

POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Actuator Positions</th>
<th>Connected Terminals</th>
<th>Throw &amp; Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pos 1</td>
<td>Pos 2</td>
<td>Pos 3</td>
</tr>
<tr>
<td>SP3T</td>
<td>NR01103</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>SP4T</td>
<td>NR01104</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>SP5T</td>
<td>NR01105</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on switch

CONTACT MATERIAL & RATING

G Gold over Bronze or Copper
Logic Level
0.4VA @ 28V AC/DC maximum

TERMINALS

13 Straight PC with Bracket
**TYPICAL SWITCH DIMENSIONS**

**45° Indexing • SP3T • Straight PC**

Actuator shown in Position 1

Terminals 1 & 5 are support pins

NR01103ANG13-1C

**45° Indexing • SP4T • Straight PC**

Actuator shown in Position 1

Terminal 1 is a support pin

NR01104ANG13-2C

**45° Indexing • SP5T • Straight PC**

Actuator shown in Position 1

NR01105ANG13-2C

**KNOBS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Without Knob</th>
<th>AT3008 Without Flange</th>
<th>AT3009 With Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Code</td>
<td></td>
<td></td>
</tr>
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</table>

Material: Glass fiber reinforced polyamide

Material: Glass fiber reinforced polyamide

Knob Colors

<table>
<thead>
<tr>
<th>Code</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Black</td>
</tr>
<tr>
<td>C</td>
<td>Red</td>
</tr>
<tr>
<td>H</td>
<td>Gray</td>
</tr>
</tbody>
</table>

**MOUNTING & INSTALLATION**

Knob Installation

To prevent knob from disassembling from the switch, it is recommended to use the type with a flange. Mount the knob with the flange (AT3009, assembled to switch) beneath the panel, as shown in illustration.
Series NR01 Subminiature Process Sealed Rotaries

Ideal for Applications that Require Small Sizes with Precision & Reliability

**Situation**

- Need for Compact Rotary Switch
- DIP Rotary Switch has Unsatisfactory Tactile Response
- Complex Functionality is Not Essential

**Solution**

- Simple, Accurate Functionality in Compact Body
- Distinctive Detent with Contact Reliability
- Single Pole 3 ~ 5 Positions

**Advantages**

- Simplified soldering and automated cleaning processes enhance production efficiency
- Reinforced bracket with crimped legs improves mounting stability and strength
- Easy, straightforward functionality
- Small, subminiature size with precise detent and crisp actuation

**Typical Applications**

- **Switching Function**
  - F1, F2, F3, F4
- **Input Switching**
  - AC, DC, GND
- **Signal Mode Selection**
  - CH1, CH2, DUAL

Handheld Automation Devices

Measuring Devices
A Comprehensive Line of Rotary Switches Meets a Variety of Applications

## Specifications

<table>
<thead>
<tr>
<th>PCB Mount Rotaries</th>
<th>NR01</th>
<th>MRB</th>
<th>MRA112</th>
<th>FR01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Poles</td>
<td>1</td>
<td>1</td>
<td>1, 2, 4</td>
<td>—</td>
</tr>
<tr>
<td>Positions</td>
<td>3, 4, 5</td>
<td>2, 3</td>
<td>2 ~ 12</td>
<td>—</td>
</tr>
<tr>
<td>Electrical Capacity</td>
<td>0.4VA Max @ 28V AC/DC Max</td>
<td>0.4VA Max @ 28V AC/DC Max</td>
<td>250mA @ 125V AC</td>
<td>100mA @ 5V DC</td>
</tr>
<tr>
<td>Electrical Life</td>
<td>10,000 Operations Min</td>
<td>10,000 Operations Min</td>
<td>10,000 Operations Min</td>
<td>10,000 Detent Operations Min</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>–25 ~ +70°C (–13 ~ +158°F)</td>
<td>–10 ~ +70°C (+14 ~ +158°F)</td>
<td>–10 ~ +70°C (+14 ~ +158°F)</td>
<td>–25 ~ +85°C (–13 ~ +185°F)</td>
</tr>
<tr>
<td>External Dimensions</td>
<td>10.7 x 10.7mm (.421 x .421&quot;)</td>
<td>14.5 x 15.74mm (.571 x .620&quot;)</td>
<td>16mm Dia (.630&quot; Dia)</td>
<td>10.0 x 10.0mm (.394 x .394&quot;)</td>
</tr>
<tr>
<td>Process Sealed</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

### Subminiature & Ultra-Miniature DIP Rotaries
- **FR01**
  - 10mm
  - Ultra-Thin
  - 100mA @ 5/50V DC
  - Subminiature
- **FR02**
  - 10mm
  - Ultra-Thin
  - 100mA @ 5/50V DC
  - Subminiature
- **ND**
  - 8mm
  - Process Sealed
  - 100mA @ 5/50V DC
  - Ultra-Miniature
- **ND3**
  - 8mm
  - Process Sealed
  - 100mA @ 5/50V DC
  - Ultra-Miniature

### Miniature & Subminiature Rotaries
- **NR01**
  - Process Sealed
  - Positive Detent
  - 0.4VA @ 28V AC/DC
  - Subminiature
- **MRB**
  - Process Sealed
  - IP67 Rated
  - 0.4VA @ 28V AC/DC
  - Miniature
- **MRX**
  - Positive Detent
  - Metal Bushing & Housing
  - 1A @ 30V DC
  - miniature

### Standard Rotaries with Multiple Positions & Poles
- **HS13**
  - 6A @ 125V AC
  - 10mm Bushing
- **TS**
  - 6A @ 125/250V AC
  - 10mm Bushing
- **HS16**
  - 12A @ 125V AC
  - 10mm Bushing
- **PS**
  - 30A @ 125/250V AC
  - 10mm Bushing

NKK offers optional knobs for Rotary Switches. See Accessories or contact our Sales Department.

Effective Date  July 2017

http://www.nkkswitches.com  •  1.877.2BUYNKK (228.9655)
7850 East Gelding Drive • Scottsdale, AZ  85260 • Telephone 480.991.0942 • Fax 480.998.1435