Installation Instructions

Original Instructions

440J-N Enabling Switch
Catalog Numbers 440J-N21TNPM, 440J-N21TNPM-NP, 440J-N2NTNPM-NE

Precautions for Safety

Turn off the power to the grip switch before installation, removal, wiring, maintenance, and inspection. Use correct size wires to meet voltage and current requirements. Tighten the terminal screws to the recommended tightening torque.

Purpose:
This grip switch is a device for enabling a machine (robot, and forth) when teaching the machine in a hazardous area manually. Configure the enabling system so that the machine can operate when the switch is in position two.

ATTENTION: Do not defeat, tamper, remove, or bypass this unit. Severe injury to personnel could result.

IMPORTANT
When using a stranded wire, make sure the terminals are not short-circuited.

Also, do not solder the core wires. Use copper Wire 60/75°C (140/167°F) only (UL 508).

Recommended ferrules (Phoenix™ Contact)

Applicable Wire Size in Terminal

<Direct wiring>: 0.14…1.5 mm² (0.005…0.06 in.²) X1pc
Wire Grip Switch according to IEC60204-1

Mounting Bracket (option)

Connector (one connector included with enabling switch)

Torque Settings
Example of Wiring Diagram
Realizing Safety Category 4

Three Position Switch, Manual Reset, Monitored Output

The external wiring is performed according to the protection measures against contact of dangerous potentials, such as double isolation or ground wire connection.

Twin screened and sheathed cable 3-Position Enabling Switch

One example of the circuit; safety relay module, MSR127RP manufactured by Allen-Bradley® Guardmaster®.

Note: Use the monitoring device (safety relay module) providing it has the capacity to detect a cross short circuit. Wire the channels 1 and 2 of the three-position switch as shown in the diagrams.

Electromechanical switches must be wired with the control unit, that the requirements from DIN EN 775, DIN EN 60204-1, DIN EN 954-1, DIN EN 1088, and VDI 2854 are fulfilled. Two stage electromechanical switches are only allowed in combination with an E-stop unit.

Contact Operation

440J-N21TNPM
Position 1  Position 2  Position 3
Push  7.0  4.2  7.0
Release  3.4  3.4

440J-N21TNPM-NE
Push  7.0  4.2  7.0
Release  3.4  3.4
Emergency stop pushbutton switch: 2 N.C. contacts (Terminal 5-6 and 7-8)

440J-N21TNPM-NP
Push  7.0  4.2  7.0
Release  3.4  3.4

Pushbutton switch: 1 N.O. contact (Terminal 7-8)

IMPORTANT
Terminals 1-2, 3-4 and 5-6 (440J-N21TNPM and 440J-21TNPM-NP) or 1-2, 3-4 (440J-N2NTNPM-NE) are positive opening when the switch operates from position 2-3.

Use contacts of terminals 1-2 and 3-4 for the output of the enabling system.

The characteristics illustrate the performance when the center of the yellow button is pressed. Pressing the edge activates one of the two three-position switches inside earlier than the other, and causes a delay in the operation of the grip switch.
## Technical Specifications

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conforming to standards</td>
<td>IEC 60947-5-1, EN 60947-5-1, GS-ET-22, JISC8201-5-1, UL 508 (UL Listed), CSA C22.2 No. 14 (cUL Listed)</td>
</tr>
<tr>
<td>Certifications</td>
<td>CE Marked for all applicable directives, cULus, TÜV SÜD</td>
</tr>
<tr>
<td>Contact configuration</td>
<td>3-position switch</td>
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<tr>
<td>Auxiliary contacts</td>
<td>1 N.C.</td>
</tr>
<tr>
<td>Emergency stop contacts</td>
<td>2 N.C.</td>
</tr>
<tr>
<td>Push button contact</td>
<td>1 N.O.</td>
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<td>Rated operational voltage (Ue)</td>
<td>30V, 125V, 250V</td>
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<td>3 A</td>
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<tr>
<td>DC Resitive load DC 12</td>
<td>2 A</td>
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<tr>
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<td>0.4 A</td>
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Minimum current | 3V, 5 mA AC/DC |
Short-circuit protection device | 250V, 10 A fuse (IEC 60127-1) |
Thermal current (lth) | 3 A |
Rated insulation voltage (Ui) | 250V (push button switch: 125V) |
Rated impulse withstand voltage (Uimp) | 2500V (except push button switch) |
Pollution degree | 3 |
Operating force | Position 2: 15 N approximate, 50 N maximum |
Actuation frequency, maximum | 1200 operations per hour |
Conduit entry | 1 x M20 (enclosed within the switch) |
Applicable cable diameter | 3…13 mm (0.27…0.51 in.) |
Insulation resistance | 100 M Ohm minimum |
Contact resistance | 100 M Ohm maximum |
Temperature rise - contact [C (F)] | 30 (86) maximum |
Temperature rise - terminal [C (F)] | 30 (86) maximum |
Actuator strength | 500 N minimum |
Weight (g (oz)) | 210 g (7.4 oz); 440J-N21TNPM; 220 g (7.76 oz); 440J-N21TNPM-NP; 250 g (8.82 oz); 440J-N2NTNPM-NE |
Color | Black/gray |
Case material of switch body | PA66 |
Rubber boot material | NBR/PVC |
Operating temperature [C (F)] | -10…60° (14…140°) |
Mechanical life - grip switch | Position 1 - 2 - 1: 1,000,000 operations; Position 1 - 2 - 3 - 1: 100,000 operations |
Electrical life - grip switch | 100,000 operations |
Electrical life - emergency stop | 100,000 operations |
Electrical life - push button | 100,000 operations |

**IMPORTANT** The operating force of the grip switch depends on the ambient temperature.
**Maintenance**

**Every Week**

Check the correct operation of the switching circuit. Also check for signs of abuse or tampering. Inspect the switch casing for damage. Of particular importance is damage, which causes loss of sealing at the lid or conduit entry.

**At Least Every Six Months**

Isolate the power. Remove the lid. Inspect all terminals for tightness. Clean out any accumulation of fine dirt, and so forth. Check for any sign of wear or damage, for example, rubber boot wear or contact oxidation, and replace if apparent. Replace cover and tighten screws to specified settings. Reinstall the power and check for correct operation. Reapply tamper evident varnish or similar compound to mountings.

**Repair**

If there is any malfunction or damage, no attempts at repair are made. The unit has to be replaced before machine operation is allowed.

**DO NOT DISMANTLE THE UNIT.**

**Precautions for Operation**

Do not apply excessive shock to the switch. Wire the switch correctly after reading this instruction sheet. To help ensure safety of the control system, connect each pair of contacts of the three-position switch (terminal number 1-2 and 3-4) to a discrepancy detection circuit such as a safety relay module (ISO 13849-1/EN 954-1).

When wiring, prevent dust, water, or oil from entering the grip switch. Do not tie the grip switch around the button with tape or string to keep the switch in position two. Otherwise, the original function of the switch is not used, which poses a great risk of danger. If used in wet locations, this device must be used with cable suitable for wet locations.

**EU Declaration of Conformity**

The Declaration of Conformity declares that the products that are shown in this document conform with the relevant requirements of the Low Voltage Directive (2014/35/EU).

These products also conform to EN 60947-5-1, EN 60947-5-8, GS-ET-22, UL 508, CSA C22.2 No. 14 and have Third-Party Approval. Conforming with the European Machinery Directive depends on the application of the product.

For a comprehensive certificate, visit: www.ab.com/safety.

**Additional Resources**

These documents contain additional information concerning related products from Rockwell Automation®.

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You can view or download publications at http://www.rockwellautomation.com/global/literature-library/overview.page. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

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