## 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.

## Applicable Wire Size in Terminal

<Direct wiring>: $0.14 \ldots 1.5 \mathrm{~mm}^{2}\left(0.005 \ldots 0.06\right.$ in. $\left.^{2}\right) \mathrm{X} 1 \mathrm{pc}$
Wire Grip Switch according to IEC60204-1



## Mounting Bracket (option)



440J-A00N

## Connector (one connector included with enabling switch)



Torque Settings


## Example of Wiring Diagram <br> 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.


One example of the circuit; safety relay module, MSR127RP manufactured by Allen-Bradley ${ }^{\circ}$ 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 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 Estop unit.

## Contact Operation



440J-N2NTNPM-NE


Emergency stop pushbutton switch: 2 N.C. contacts (Terminal 5-6 and 7-8)
440J-N21TNPM-NP


Pushbutton switch: 1 N.0. contact (Terminal 7-8)
$\square=\square \square$

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

| Attribute |  |  |  |  | Value |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conforming to standards |  |  |  |  | IEC 60947-5-1, EN 60947-5-1, GS-ET-22, JIS88201-5-1, UL 508 (UL Listed), (SA C22.2 No. 14 (cUL Listed) |  |  |
| Certifications |  |  |  |  | CE Marked for all applicable directives, CULus, TÖV SUD |  |  |
| Contact configuration 3-position switch |  |  |  |  | Two contacts |  |  |
| Auxiliary contacts |  |  |  |  | 1 N.C. |  |  |
| Emergency stop contacts |  |  |  |  | 2N.C. |  |  |
| Push button contact |  |  |  |  | 1 N.O. |  |  |
| Rated operational voltage (Ue) |  |  |  |  | 30 V | 125V | 250 V |
|  | 3-position switch | 440-N21TNPM, 440J-N21TNPM-NP, 440J-N2NTNPM-NE | AC | Resistive load AC 12 |  | 3 A | 1.5 A |
|  |  |  |  | Inductive load AC 15 | - | 1.5 A | 0.75 A |
|  |  |  | DC | Resistive load DC 12 | 2A | 0.4 A | 0.2 A |
|  |  |  |  | Inductive load DC 13 | 1A | 0.22 A | 0.1 A |
|  | Auxiliary switch | 440-N21TNPM, 440J-N21TNPM-NP | AC | Resistive load AC 12 | - | 2A | 1A |
|  |  |  |  | Inductive load AC 15 | - | 1A | 0.5 A |
|  |  |  | DC | Resistive load DC 12 | 2A | 0.4A | 0.2 A |
|  |  |  |  | Inductive load DC 13 | 1A | 0.22 A | 0.1 A |
|  | Emergency stopswitch switch | 440--N2NTNPM-NE | AC | Resistive load AC 12 | - | - | - |
|  |  |  |  | Inductive load AC1 | - | - | 0.5 A |
|  |  |  | DC | Resistive load DC 12 | - | - | - |
|  |  |  |  | Inductive load DC 13 | - | - | 0.1A |
|  | Push button switch | 440J-N21TNPM-NP | AC | Resistive load AC 12 | 1.5 A | 0.5 A | - |
|  |  |  |  | Inductive load AC 15 | 1 A | 0.3 A | - |
|  |  |  | DC | Resistive load DC 12 | 1A | 0.2A | - |
|  |  |  |  | Inductive load DC 13 | 0.7 A | 0.1A | - |
| Minimum current |  |  |  |  | 3V,5 mA AC/DC |  |  |
| Short-ircuit protection device |  |  |  |  | 250V, 10 A fuse (IEC 60127-1) |  |  |
| Thermal current ( $l_{\text {th }}$ ) |  |  |  |  | 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 Position 3 |  |  |  |  | 15 N approximate 50 N maximum |  |  |
| Actuation frequency, maximum |  |  |  |  | 1200 operations per hour |  |  |
| Protection |  |  |  |  | IP66: 440J-N21TNPM; \|P65: 440J-N21TNPM-NP, 440J-N2NTNPM-NE |  |  |
| Conduite entry |  |  |  |  | $1 \times$ M20 (enclosed within the swith) |  |  |
| Applicable cable diameter |  |  |  |  | 7...13 mm (0.27 ...0.51 in.) |  |  |
| Insulation resistance |  |  |  |  | 100 M Ohm minimum |  |  |
| Contact resistance |  |  |  |  | 100 M Ohm maximum |  |  |
| Temperature rise - contact [ $(\mathrm{F})$ ] |  |  |  |  | 30 (86) maximum |  |  |
| Temperature rise - terminal [C(F)] |  |  |  |  | 30 (86) maximum |  |  |
| Actuator strength |  |  |  |  | 500 N minimum |  |  |
| Weight [g (oz)] |  |  |  |  | 210 g (7.40z): 440--N21TNPM; 220 g (7.76 0z): 440J-N21TNPM-NP; 250 g (8.82 07): 440J-N2NTNPM-NE |  |  |
| Color |  |  |  |  | Black/gray |  |  |
| Case material of switch body |  |  |  |  | PA66 |  |  |
| Rubber boot material |  |  |  |  | NBR/PVC |  |  |
| Operating temperature [C (F)] |  |  |  |  | $-10 \ldots 60^{\circ}\left(14 \ldots 140^{\circ}\right)$ |  |  |
| 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 oxidization, and replace if apparent. Replace cover and tighten screws to specified settings. Reinstate 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 ${ }^{\circ}$

| Resource | Description |
| :--- | :--- |
| Industrial Automation Wiring and Grounding Guidelines, <br> publication 17770-4.1 | Provides general guidelines for installing a <br> Rockwell Automation industrial system. |
| Product Certifications website, <br> http://ww.rockwellautomation.com/global/certification | Provides declarations of conformity, <br> certificates, and other certification details. |
| /overview.page |  |
| 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. |  |

Rockwell Automation maintains current product environmental information on its website at
http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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