

Installation Instructions

Original Instructions



Allen-Bradley



440J-N Enabling Switch

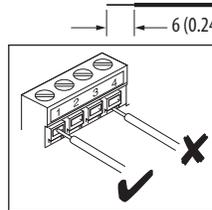
Catalog Numbers 440J-N21TNPM, 440J-N21TNPM-NP, 440J-N2NTNPM-NE

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.

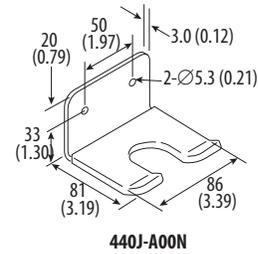
Purpose:

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.



Type	Applicable Wires
AI0.5-8WH	0.34...0.5 mm ² (0.013...0.019 in.)
AI0.75-8GY	0.5...0.75 mm ² (0.019...0.029 in.)
AI1.0-8RD	0.75...1.0 mm ² (0.029...0.039 in.)
AI1.5-8BK	1.0...1.5 mm ² (0.039...0.059 in.)

Mounting Bracket (option)

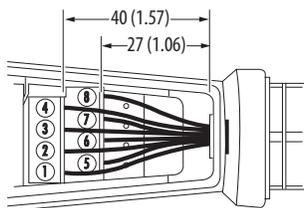


ATTENTION: Do not defeat, tamper, remove, or bypass this unit. Severe injury to personnel could result.

Applicable Wire Size in Terminal

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

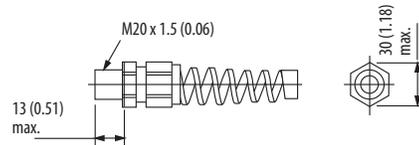
IMPORTANT When using a stranded wire, make sure the terminals are not short-circuited.



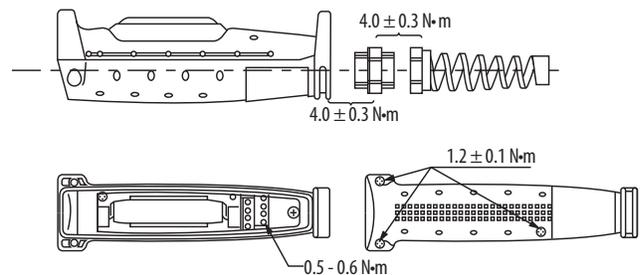
Recommended ferrules (Phoenix™ Contact)

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

Connector (one connector included with enabling switch)

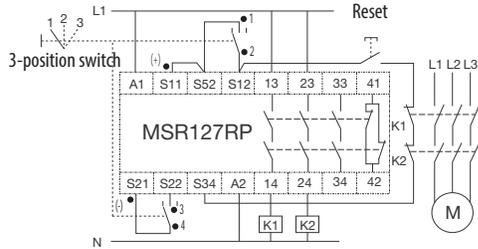


Torque Settings

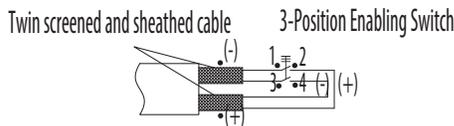


Example of Wiring Diagram Realizing Safety Category 4

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.

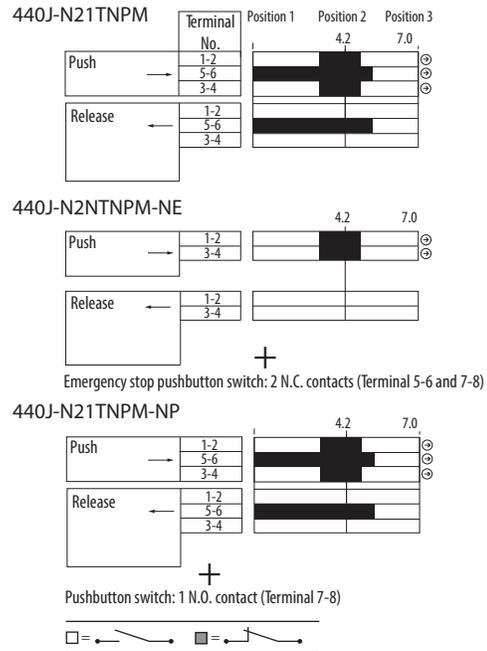


One example of the circuit; safety relay module, MSR127RP manufactured by Allen-Bradley® Guardmaster®.

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 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



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, JISC8201-5-1, UL 508 (UL Listed), CSA C22.2 No. 14 (cUL Listed)			
Certifications				CE Marked for all applicable directives, cULus, TÜV SUD			
Contact configuration 3-position switch				Two contacts			
Auxiliary contacts				1 N.C.			
Emergency stop contacts				2 N.C.			
Push button contact				1 N.O.			
Rated operational voltage (Ue)				30V	125V	250V	
Rated operational current (Ie)	3-position switch	440J-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	2 A	0.4 A	0.2 A
				Inductive load DC 13	1 A	0.22 A	0.1 A
	Auxiliary switch	440J-N21TNPM, 440J-N21TNPM-NP	AC	Resistive load AC 12	-	2 A	1 A
				Inductive load AC 15	-	1 A	0.5 A
			DC	Resistive load DC 12	2 A	0.4 A	0.2 A
				Inductive load DC 13	1 A	0.22 A	0.1 A
	Emergency stop switch	440J-N2NTNPM-NE	AC	Resistive load AC 12	-	-	-
				Inductive load AC 1	-	-	0.5 A
			DC	Resistive load DC 12	-	-	-
				Inductive load DC 13	-	-	0.1 A
	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	1 A	0.2 A	-
				Inductive load DC 13	0.7 A	0.1 A	-
Minimum current				3V, 5 mA AC/DC			
Short-circuit protection device				250V, 10 A fuse (IEC 60127-1)			
Thermal current (I _{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; IP65: 440J-N21TNPM-NP, 440J-N2NTNPM-NE			
Conduit entry				1 x M20 (enclosed within the switch)			
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 [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 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®.

Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

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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Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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