Installation Instructions

Original Instructions

Allen-Bradley by ROCKWELL AUTOMATION

Guardmaster®

TLS-GD2 Guard Locking Switches

Catalog Numbers 440G-T2*x*

Installation of the TLS-GD2 Guard Locking Switches must be in accordance with the following steps and stated specifications and implemented by suitably competent personnel. The unit is not to be used as a mechanical stop. Guard stops and guides must be fitted.

Adherence to the recommended maintenance instructions forms part of the warranty.

ATTENTION: The presence of spare actuators can compromise the integrity of safety systems. Personal injury or death, property damage, or economic loss can result. Appropriate management controls, working procedures and alternative protective measures must be introduced to control their use and availability.

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

ATTENTION: The sensors can only be used on metal surfaces that provide low impedance connection to the earthing system of the machine.

Specifications

Attribute	Value
Safety ratings	
Standards	ISO 14119, IEC 60947-5-1
Safety classification	Type 2 interlocking device with guard locking and low coding (tongue) per ISO 14119
Functional safety	See the Functional Safety Data Sheet publication, SAFETY-SR001
Certifications	CE Marked for all applicable directives, UKCA Marked for all applicable regulations, cULus Listed, and TÜV Certified
Outputs	
Safety contacts (1)	• TLS-1 and -2: 3 N.C. direct opening action • TLS-3: 4 N.C. direct opening action
Rated impulse withstand voltage UIMP	2500V
Current, min	5V 5 mA DC
Auxiliary contacts	• TLS-1 and -2: 2 N.O. (1 solenoid monitoring) • TLS-3: 1 N.O
Thermal current/I_{th}	10 A
Rated insulation voltage (Ui)	500V
Switching current at voltage, min	3 mA at 18V DC

Attribute	Value			
Utilization Category				
A600/AC-15 (Ue)	600V	500V	240V	120V
A600/AC-15 (Ie)	1.2 A	1.4 A	3 A	6 A
DC-13 (Ue)	24V			
DC-13 (Ie)	2 A			
Solenoid Characteristics				
Holding force F_{max} (ISO 14119)	• Plastic pins: 1950 N (488 lbf) • Steel bolts: 2600 N (585 lbf)			
Holding force F_{zh} (ISO 14119)	• Plastic pins: 1500 N (337 lbf) • Steel bolts: 2000 N (450 lbf)			
Power supply	24V AC/DC or 110V AC or 230V AC (solenoid)			
Solenoid power	7 W typical 100% ED			
Escape release button	Force max: 50 N (11.25 lbf)			
Operating Characteristics				
Break contact force, min	30 N (7 lbf)			
Actuation speed, min	100 mm (3.94 in.) per minute			
Actuation speed, max	160 mm (6.29 in.)/s			
Actuation frequency, ma	1 cycle/s			
Operating radius, min	160 mm (6.3 in.) [80 mm (3.15 in.) with flexible actuator]			
Mechanical life	1,000,000 operations			
Environmental				
Enclosure type rating	IP66, IP67, IP69K (2)			
Operating temperature	-20...+60 °C (-4...+140 °F)			
Physical characteristics				
Material	• Housing: UL Approved glass-filled PBT • Actuator: Stainless steel			
Weight	400 g (0.88 lb)			
Color	Red			
Torque settings, max	• Mounting bolts: 1.4 N•m (12.39 lb•in) • Lid screws: 1.2 N•m (10.62 lb•in • Terminal screws: 1.02 N•m (9 lb•in) • Terminal block screws: 0.8 N•m (7.08 lb•in)			
Pollution degree	3			

(1) The safety contacts are described as normally closed (N.C.) that is, with the guard closed, the actuator in place (where relevant), and the machine able to start.
(2) For IP69K, use appropriate IP rated glands/cordset.

Rockwell Automation

Installation

Figure 1 - Actuator Rotation

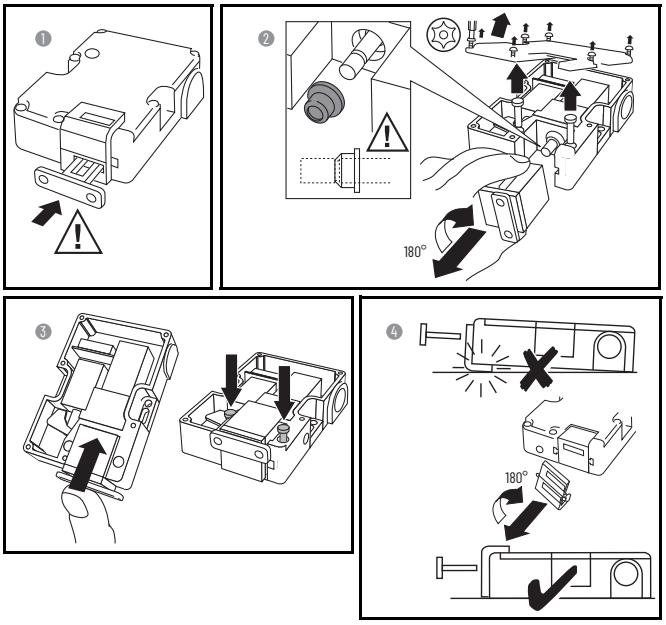


Figure 2 - Typical Mounting

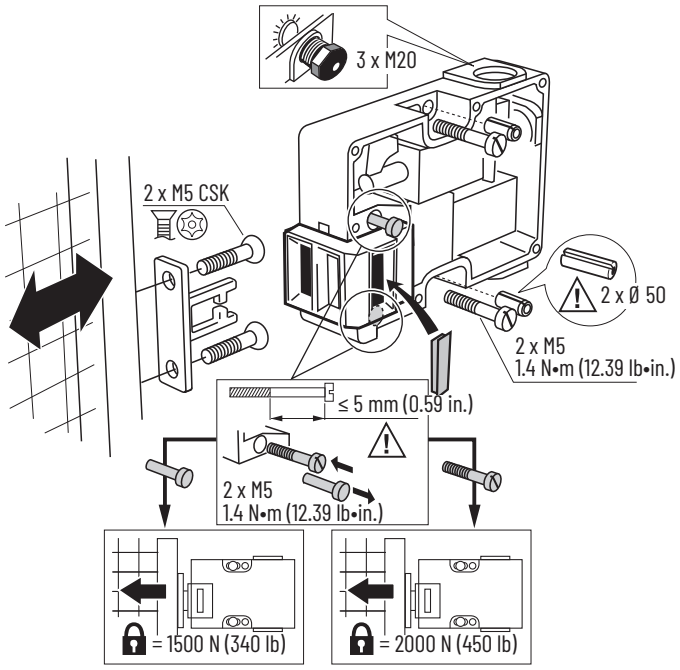


Figure 3 - Fit the Override Covers

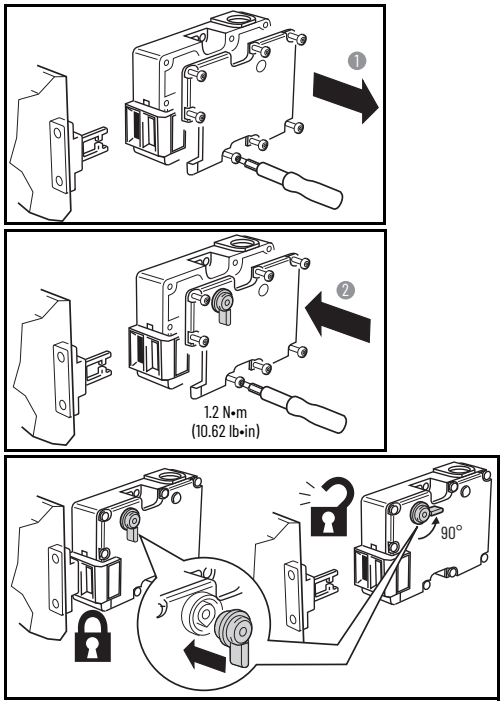
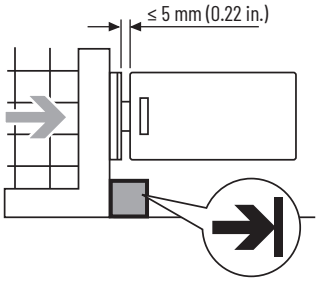


Table 1 - Actuator Minimum Radius

Actuator	Radius, Min [mm (in.)]			
440G-A27011	160 (6.3)	160 (6.3)	160 (6.3)	160 (6.3)
440K-A11112	160 (6.3)	160 (6.3)	160 (6.3)	160 (6.3)
440G-A27143	80 (3.15)	80 (3.15)	80 (3.15)	80 (3.15)

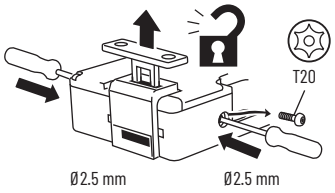
Figure 4 - Proper Positioning



Monitoring of safety contacts and solenoid feedback (in series) is available when jumpers are in place, and:

- For TLS-1 and -2: Pins 4...6 on the 12-pin M23, or pink-yellow wires on the 12-pin cordset are used.
- For TLS-3: Pins 4...8 on the 12-pin M23, or pink-yellow and white-red/blue wires on the 12-pin cordset are used.

Figure 5 - Actuator Lock



IMPORTANT To monitor the safety contacts and the solenoid feedback independently:

- Use the 12-wire cordset 889M-F12AH-*x*

and

- For TLS-1 and -2, remove the jumper between 12-41.
- For TLS-3, remove the jumpers between 12-41 and 22-51.

Wiring

Figure 6 - TLS-1 GD2 and TLS-2 GD2

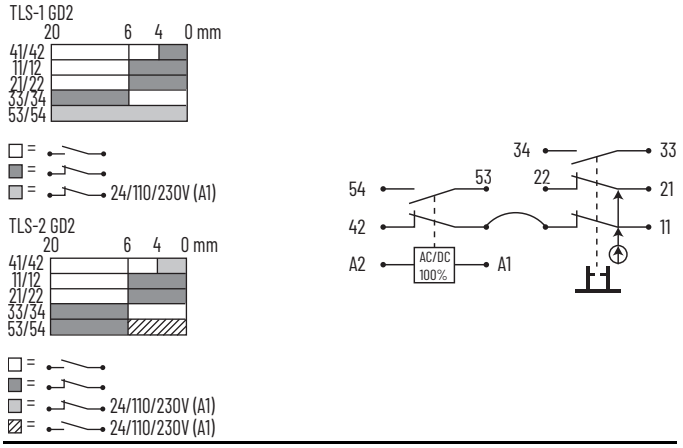


Figure 7 - TLS-3 GD2

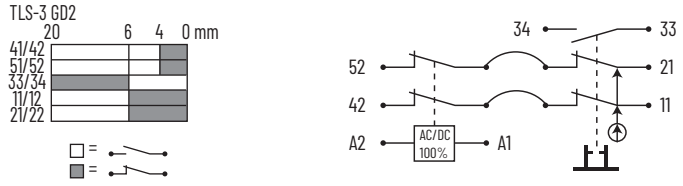
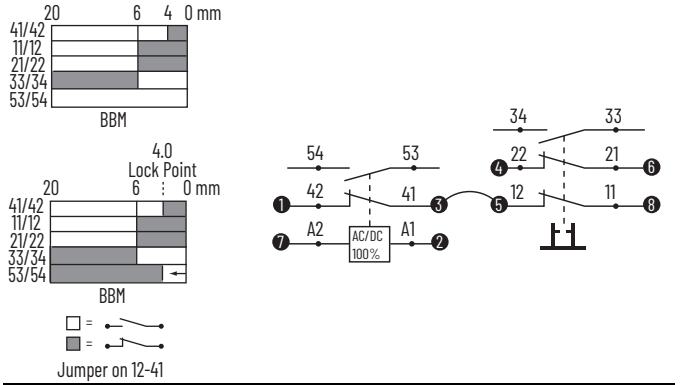


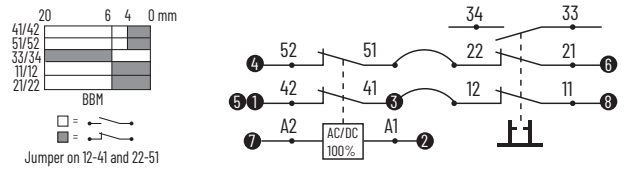
Figure 8 - TLS-1 and TLS-2 8-pin Micro (M12)



	Pin	Function
	1	Solenoid A
	2	Power
	3	Solenoid A
	4	Safety B
	5	Safety A
	6	Safety B
	7	Power
	8	Safety A

Recommended cable: Cat. No. 889D-F8NB-*x* (1)

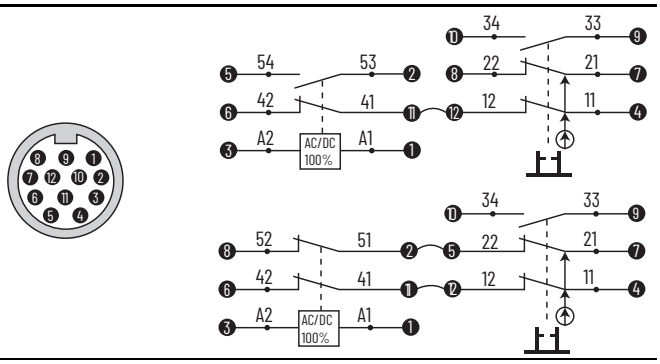
Figure 9 - TLS-3 8-pin Micro (M12)



	Pin	Function
	1	Solenoid A
	2	Power
	3	Solenoid A
	4	Safety B and Solenoid B
	5	Safety A and Solenoid A
	6	Safety B and Solenoid B
	7	Power
	8	Safety A and Solenoid A

Recommended cable: Cat. No. 889D-F8NB-*x* (1)

Figure 10 - TLS-3 12-pin (M23)



Recommended cable: Cat. No 889M-F12AH-*x* (1)
Gray/pink not connected

(1) x = 2 (2 m [6.6 ft]), 5 (5 m [16.4 ft]), or 10 (10 m [32.8 ft]) for standard cable lengths. For other cable lengths, contact your local Allen-Bradley distributor or Rockwell Automation sales office.

Maintenance

Frequency	Description
Weekly	• Check the correct operation of the switching circuit. • Check for signs of abuse or tampering. • Inspect the switch casing for damage. • Replace the unit if damage is apparent.
At least every 6 months	1. Isolate all power. 2. Remove the lid. 3. Inspect all terminals for tightness. 4. Clean out any accumulation of fine dirt and so on. 5. Check for any sign of wear or damage, for example, actuator wear, cam assembly wear, contact oxidization and replace if apparent. 6. Replace covers and tighten screws to specified settings. 7. Reinstate the power and check for correct operation. 8. Reapply tamper-evident varnish or similar compound to screws.

Repair

If there is any malfunction or damage, do not attempt to repair. The unit must be replaced before machine operation is allowed.

IMPORTANT Do not dismantle the unit.

UL508 Information

When used in elevated ambient temperatures, the temperature rating of field wiring must not be less than ambient.

Use 75°C (167 °F) copper conductors only. Use only one conduit entrance for field connections.

The equipment is acceptable for use with a non-metal enclosed wiring system only and electrical specifications of contact rating code.

Approximate Dimensions

Figure 11 - TLS-GD2 Guard Locking Switch Body [mm (in.)]

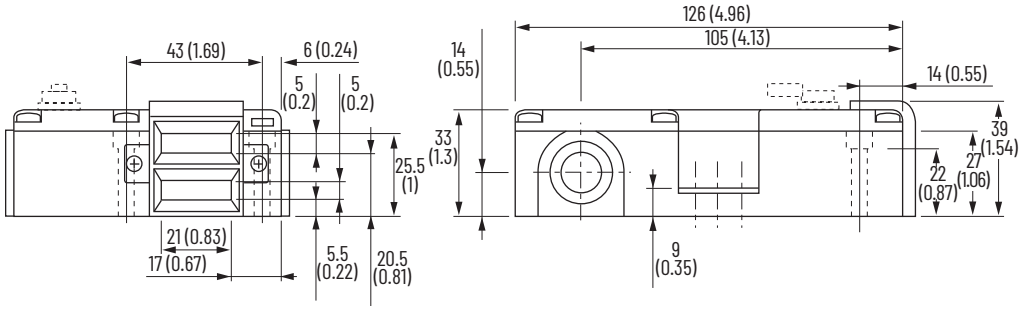
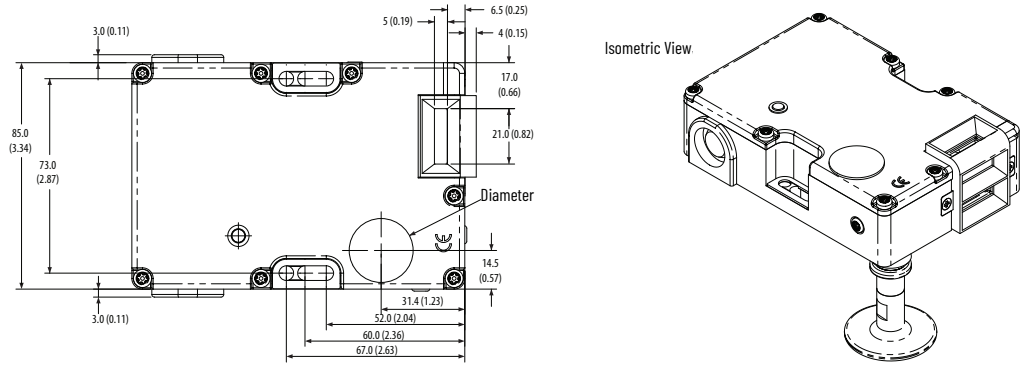


Figure 12 - TLS-GD2 Escape Release [mm (in.)]



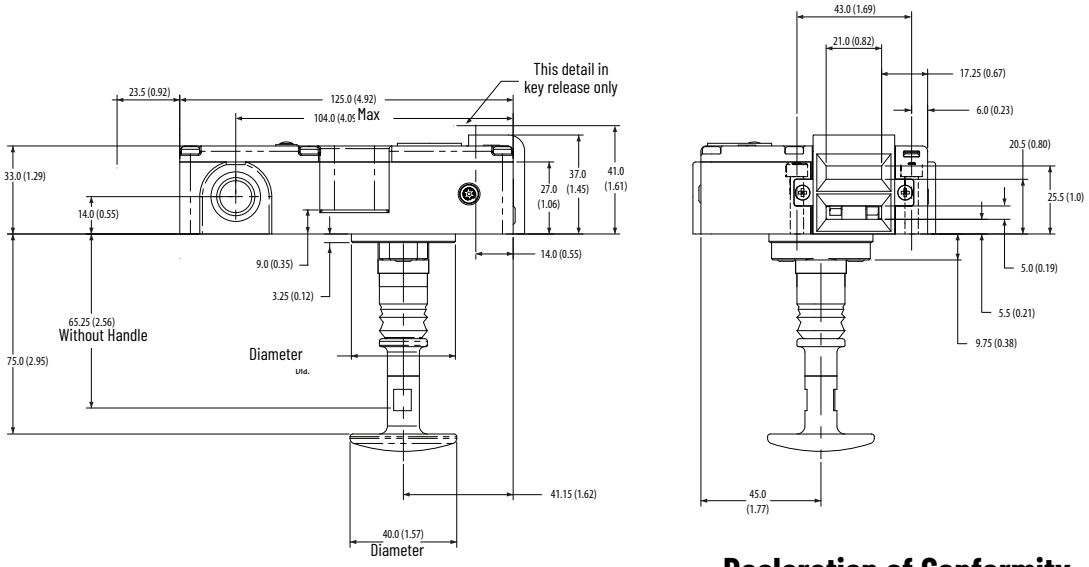
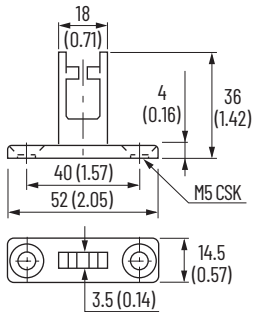
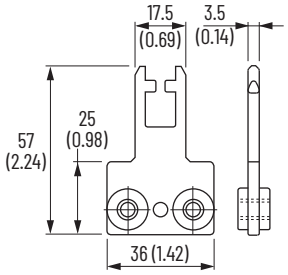


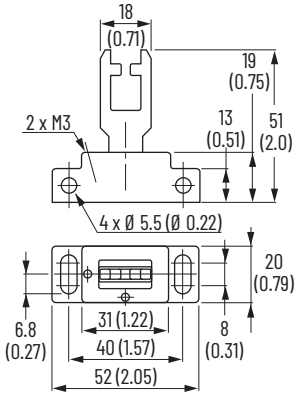
Figure 13 - Actuators [mm (in.)]



Cat. No. 440G-A27011



Cat. No. 440K-A11112



Cat. No. 440G-A27143

Declaration of Conformity

CE Conformity

Rockwell Automation declares that the products that are shown in this document conform with the Essential Health and Safety Requirements (EHSRs) of the European Machinery Directive (2006/42/EC).

For a comprehensive CE certificate visit: rok.auto/certifications.

UKCA Conformity

Rockwell Automation declares that the products that are shown in this document are in compliance with Supply of Machinery (Safety) Regulations (2008 No. 1597).

For a comprehensive UKCA certificate visit: rok.auto/certifications.

Additional Resources

To download publications, visit rok.auto/literature and search for the following publication numbers.

Resource	Description
Safety Switches Specifications Technical Data, publication SWITCH-TD001	Provides specification information for safety switch devices.
Functional Safety Data Sheet, publication SAFETY-SR001	Provides functional safety data for Rockwell Automation products.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Knowledgebase	Access Knowledgebase articles.	rok.auto/knowledgebase
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

Documentation Feedback

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at rok.auto/docfeedback.

Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at rok.auto/docfeedback.
For technical support, visit rok.auto/support.

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

Connect with us.

rockwellautomation.com — expanding **human possibility**®

AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000
EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2663 0600
ASIA PACIFIC: Rockwell Automation SEA Pte Ltd, 2 Corporation Road, #04-05, Main Lobby, Corporation Place, Singapore 618494, Tel: (65) 6510 6608
UNITED KINGDOM: Rockwell Automation Ltd., Pitfield, Kiln Farm, Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800

Allen-Bradley, expanding human possibility, Guardmaster, and Rockwell Automation are trademarks of Rockwell Automation, Inc.
Trademarks not belonging to Rockwell Automation are property of their respective companies.

PN-72643

Publication 440G-IN022B-EN-P - October 2024 | Supersedes Publication 440G-IN022A-EN-P-June 2022
Copyright © 2024 Rockwell Automation, Inc. All rights reserved. Printed in the U.S.A.

PN-72643
78381 Ver 08