TLSZR/L-GD2 Guard Locking Switch Installation Instructions

IMPORTANT	Do not attempt to install this device unless the installation instructions have been studied and understood. This installation instruction sheet is available in some languages at www.rockwellautomation.com/literature. Select publication language and type “TLSZR/L-GD2” in the search field.
IMPORTANT	Ne pas tenter pas d'installer ce dispositif sans avoir étudié et compris les instructions d'installation. Cette notice d'installation est disponible dans certaines langues sur le site www.rockwellautomation.com/literature. Sélectionner la langue de la publication et saisir « TLSZR/L-GD2 » dans le champ de recherche.
WICHTIG	Versuchen Sie nicht, dieses Gerät zu installieren, bevor Sie die Installationsanleitung gelesen und verstanden haben. Diese Installationsanleitung steht in mehreren Sprachen unter der folgenden Adresse zur Verfügung:www.rockwellautomation.com/literature. Wählen Sie unter "Publication Language" die entsprechende Sprache aus und geben Sie "TLSZR/L-GD2" in das Suchfeld ein.
IMPORTANTE	Non installare questo dispositivo senza prima avere letto e compreso le istruzioni per l'installazione. Queste istruzioni per l'installazione sono disponibili per alcune lingue sul sito www.rockwellautomation.com/literature. Selezionare la lingua della pubblicazione e digitare "TLSZR/L-GD2" nel campo di ricerca.
IMPORTANTE	Não instale esse dispositivo sem estudar e compreender as instruções de instalação. Essa folha de instruções de instalação está disponível em algumas línguas em www.rockwellautomation.com/literature. Selecione a língua de publicação e escreva "TLSZR/L-GD2" no campo de pesquisa.
IMPORTANTE	No instale este dispositivo sin estudiar y entender las instrucciones de instalación. Esta hoja de instrucciones de instalación está disponible en algunos idiomas en www.rockwellautomation.com/literature. Seleccione el idioma de publicación e ingrese "TLSZR/L-GD2" en el campo de búsqueda.

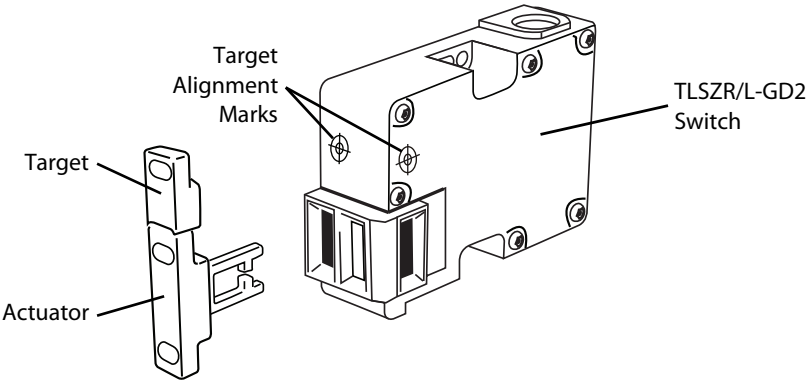
Allen-Bradley • Rockwell Software

Rockwell Automation

Table of Contents

Installation Instructions

IMPORTANT: SAVE THESE INSTRUCTIONS FOR FUTURE USE



Installation must be in accordance with the following steps and stated specifications and should be carried out by 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.

This device is intended to be part of the safety related control system of a machine. Before installation, a risk assessment should be performed to determine whether the specifications of this device are suitable for all foreseeable operational and environmental characteristics of the machine to which it is to be fitted. Refer to Technical Specifications for certification information and ratings.

Use nonremovable screws, bolts, or nuts to mount the switch and actuators. Do not over torque the mounting hardware.

For use with flexible actuator only, 440G-A27143.

Technical Specifications

Safety Ratings	
Standards	IEC 60947-5-3, IEC 60947-5-1, IEC 61508, EN ISO 13849-1, IEC 62061, ISO 14119
Safety Classification: Guard door sensing	PLe per ISO 13849-1, SIL 3 per IEC 61508 and IEC 62061, PDF-M per IEC 60947-5-3
Functional Safety Data: Guard door sensing	PFHD: 1.69 x 10^{-9} Dual channel interlock may be suitable for use in application up to PLe (according to ISO 13849-1) and for use up to SIL3 systems (according to IEC 62061) depending application characteristics. Mission time/PTI: 20 years or 1 x 10^6 cycles.
Certifications	CE Marked for all applicable EU directives, cULus (UL 508), and TÜV.

Operating Characteristics		
TLSZR-GD2	Power to release	
TLSZL-GD2	Power to lock	
Assured Locking Distance [mm (in.)]	Maximum target distance: 13 (0.51) Maximum clearance between actuator base and switch in the door-closed position: 5 mm (See "Clearance in Closed Position [mm (in)]" on page 8)	
Torque for M5 Mounting	1.4 Nm (12.39 lb-in.)	
Torque for Cover Mounting	1.2 Nm (10.62 lb-in.)	
Locking Force Fmax	Plastic pins: 1950 N (488 lb)	Steel bolts: 2600 N (585 lb)
Locking Force Fzh (with EN/ISO 14119)	Plastic pins: 1500 N (337 lb)	Steel bolts: 2000 N (450 lb)
Maximum Output Current (all outputs)	200 mA	
Current Consumption - solenoid not energized (no load supply current)	50 mA	
Current Consumption - solenoid energized (no load supply current)	120 mA (260 mA inrush)	
Solenoid Duty Cycle	100%	
Off-State Current	< 0.5 mA DC	
Maximum Number of Switches, connected in series	Unlimited. See "Unit Response Time" on page 14.	
Operating Voltage Ue	24V DC +10% / -15%	
Frequency of Operating Cycle	1 Hz	
Actuation Speed, Max.	160 mm (6.29 in.) per second	
Actuation Speed, Min.	100 mm (3.94 in.) per minute	
Response Time (Off)	75 ms first switch, 25 ms additional for each switch	
Utilization Category (IEC 60947-5-2)	DC-13 24V 200 mA	
Impulse Withstand Voltage Uimp	250V	
Pollution Degree	3	
Protection Class	2	
Mechanical Life	1 x 10^6 cycles	

Outputs (Guard door closed and locked)		
Outputs	Description	Status
Safety	2 x PNP, 0.2 A max.	ON (+24V DC)
Auxiliary	1 x PNP, 0.2 A max.	OFF (0V DC)

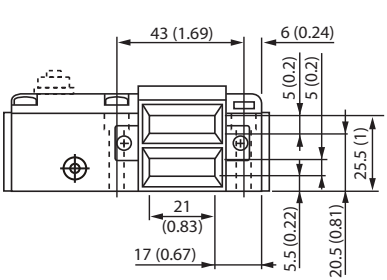
Environmental	
Operating Temperature [C (F)]	-10°…+60° C (+14°…+140° F)
Operating Humidity	5%…95% relative

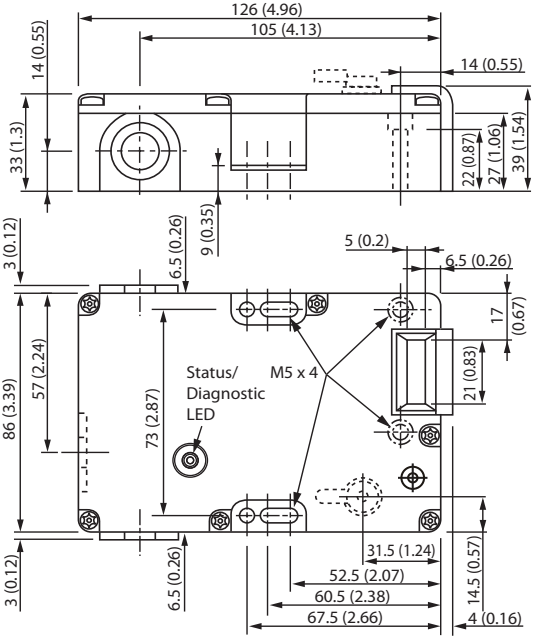
Environmental	
Enclosure Ingress Rating	NEMA 3, 4X, 12, 13, IP66, IP67, IP69K
Shock and Vibration	IEC 68-2-27 30 g, 11 ms/IEC 68-2-6 10…55Hz
Radio Frequency	IEC 61000-4-3 IEC 61000-4-6

General	
Housing Material	UL approved glass filled PBT
Actuator Material	Stainless Steel
Target Material	UL approved glass filled PBT
Connection	M12 8-pin connector

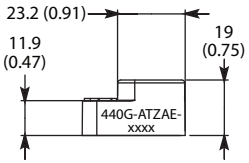
Protection	
Short-Circuit Protection	Incorporated
Current Limitation	Incorporated
Overload Protection	Incorporated
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Reverse Polarity Protection	Incorporated
Overvoltage Protection	Incorporated
Thermal Shutdown/Restart	Incorporated

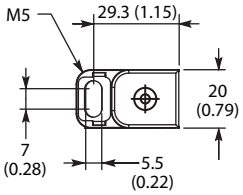
Dimensions [mm (in.)]



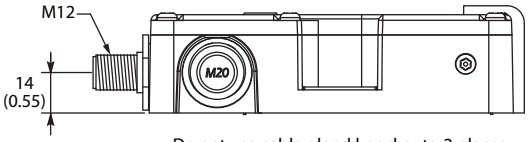


Target Alignment Mark

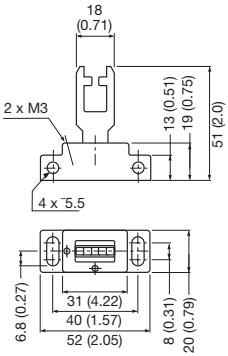




Target

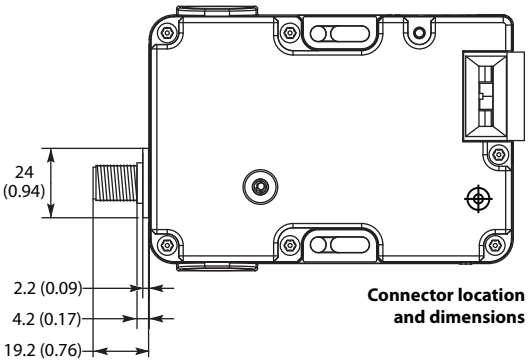


Do not use cable gland knockouts, 2 places



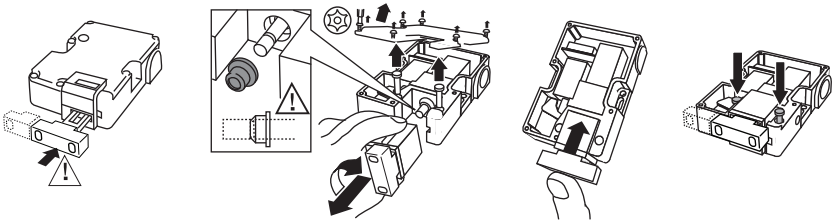
Actuator

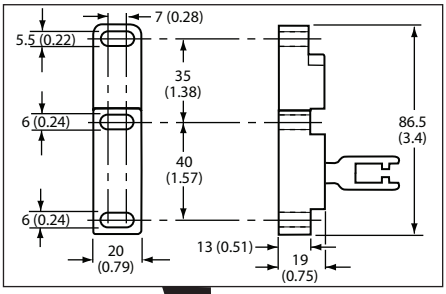
Use with flexible actuator only:
440G-A-27143

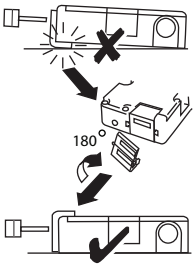


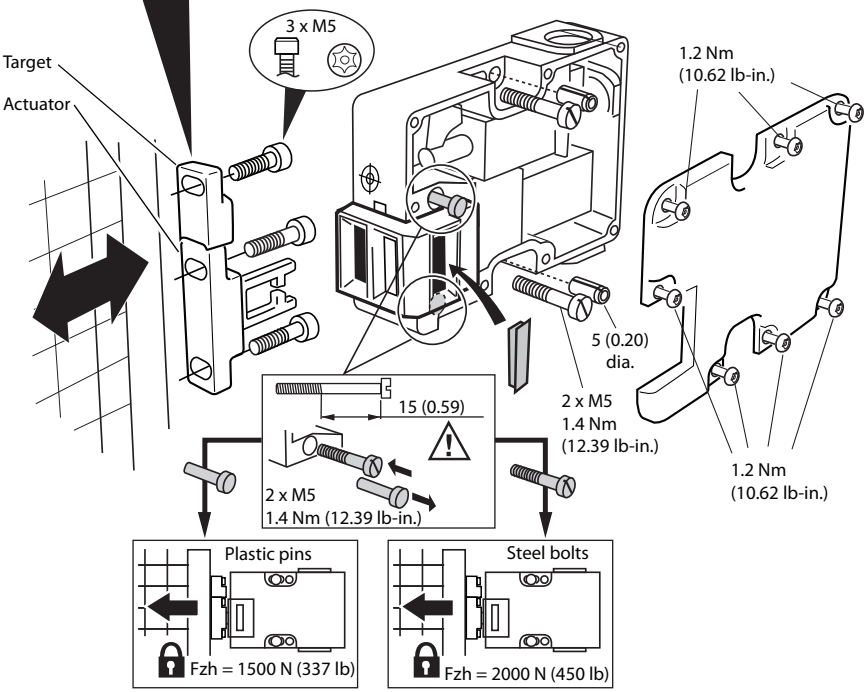
Connector location and dimensions

Mounting Information [mm (in.)]

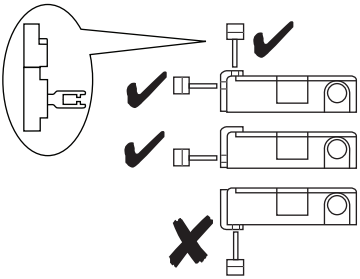








Allowable Approach Directions

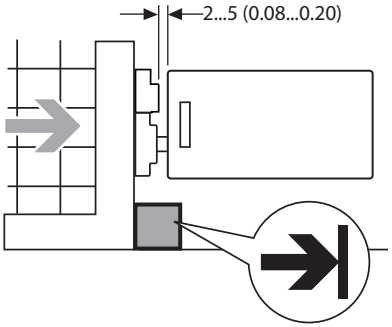


The actuator and target should always be mounted as “close coupled” and can approach the switch in any of the three entry slot positions shown.

Approach from the underside is not allowed.

Clearance in Closed Position [mm (in)]

(and Maximum Actuator Insertion Distance for Locking)

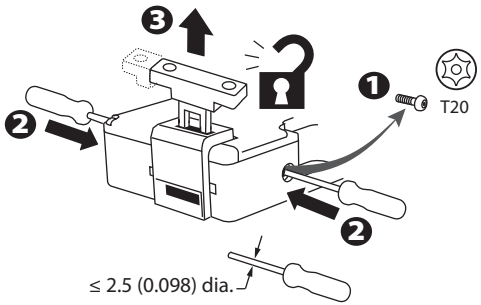


IMPORTANT	Do not use the switch as a guard stop.

Minimum clearance: 2 (0.08)

Maximum assured locking distance: 5 (0.20)

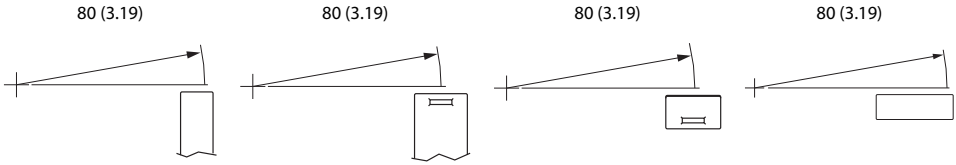
Auxiliary/Manual Release [mm (in.)]



If power is supplied to the switch and the switch is in the locked state, operation of the auxiliary release will cause the switch to enter a fault condition (blinking red LED).

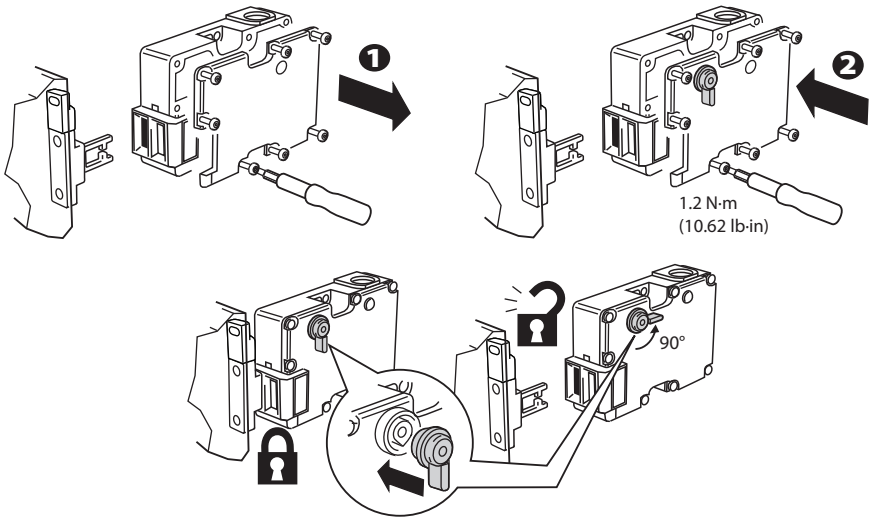
To reset the switch, cycle the power.

Minimum Operating Radius [mm (in.)]



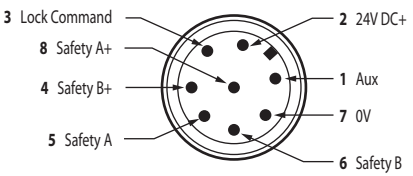
Minimum operating radius is for all planes of approach of the actuator key, both along the length and perpendicular to the key. Use the two adjusting setscrews on the actuator to optimize the key angle.

Manual Override Key for Power-to-Release Version



The cover with manual override key is intended for use with a power-to-release version TLSZR-GD2.
It provides an auxiliary release function for use when power is not available to achieve automatic/electrical interlocking.

Connections

8-Pin Micro (M12)			
8-Pin Cordset 889D-F8AB-* or cable version	**Color**	**Function**	**Pin**
	White	Aux	1
	Brown	24V DC+	2
	Green	Lock	3
	Yellow	Safety B+	4
	Grey	Safety A	5
	Pink	Safety B	6
	Blue	Gnd / 0V	7
	Red	Safety A+	8

* Replace symbol with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.

Status/Diagnostic LED Indicator

Operating

Status/Diagnostic LED State	Meaning
Solid Green	Door/Guard closed and locked, safety outputs active.
Solid Red	Door/Guard not locked, safety outputs off.
Blinking Red	Unit failure. See Troubleshooting, below.
Blinking Green	Door/Guard closed and locked, no input signal.

Troubleshooting

Status/Diagnostic LED State	Status	Troubleshooting
Off	Not powered	N/A
Solid Green	OSSD on	N/A
Solid Red	OSSD not active	N/A
Blinking Green	Power up test or Safety inputs not present	Check 24V DC or OSSD inputs (yellow and red wire)
Blinking Red	1 Hz Flash: Recoverable fault 4 Hz Flash: Non-recoverable fault	Recoverable fault: Check OSSD. Outputs are not shorted to GND, 24V DC, or each other. Cycle power. Non-recoverable fault: Cycle power.

For Learn Process LED error codes, see page 12.

Commissioning

Before use, the switch must first "learn" a new RFID door target. This is not done at the factory, as there are two options:

- **"Multi-Time" learn:** the switch can learn up to eight targets consecutively
- **"One-Time" learn:** the switch can learn just one target, for life, non-reversible*

  * "One-Time" learn can be invoked at any time, not just at commissioning. For example, the switch could "Multi-Time" learn consecutively four different targets, and then complete a "One-Time" learn that would prevent it from learning any more targets.

IMPORTANT	During the learning process the target and actuator must always be inserted or withdrawn from the switch together in their normal mounting configuration. If the target is introduced or withdrawn without the actuator, or the actuator is inserted without the target present, then a non-recoverable fault condition may occur (requiring a power off-on cycle).

"Multi-Time" Learn Process

Learning the first "Multi-Time" target

- Connect the switch to 24Vdc (see wiring diagrams on pages 13 through 15).
  The Status/Diagnostic LED will blink the number of times a new target may be learned (eight times when new), and then repeat, indicating that the switch has not yet learned a target.
- The switch will automatically start the learning process as soon as a target and actuator are placed into the door-closed, locked position of the switch

IMPORTANT	Leave the target/actuator in the door-closed position during the learning process. If they are removed during the learning process, the ability to learn an additional target will be disabled.

The learning sequence as indicated by Status/Diagnostic LED:

- Target present: Blinking Green, 1Hz rate
- Verifying target: Blinking Green/Red, 1Hz rate (15 s)
- Programming switch: Blinking Green/Red, 4 Hz rate (15 s)
- Programming finalizing: Blinking Green (number of learns left, 15 sec)
- Ready state (learn is complete): Solid Green (TLSZR), Solid Red (TLSZL)

Learning additional new "Multi-Time" targets

Mount the new target to the door and repeat the above process, introducing the target and actuator to the switch as described above. During programming finalizing, the LED will blink Green the number of learns left.

"One-Time" Learn Process

- Proceed as the "Multi-Time" learn process above except that at the programming finalizing stage withdraw the target and actuator away from the switch until the LED turns to solid Red, then straightaway replace the target and actuator back to the switch. This action must be completed within 15s *.
- The LED blinks and then turns solid to indicate that learn is complete:

  TLSZR: Solid Green
  TLSZL: Solid Red

  * For power-to-unlock switches, in order to be able to withdraw the target and actuator away from the switch as described above it will be necessary to execute a manual release.

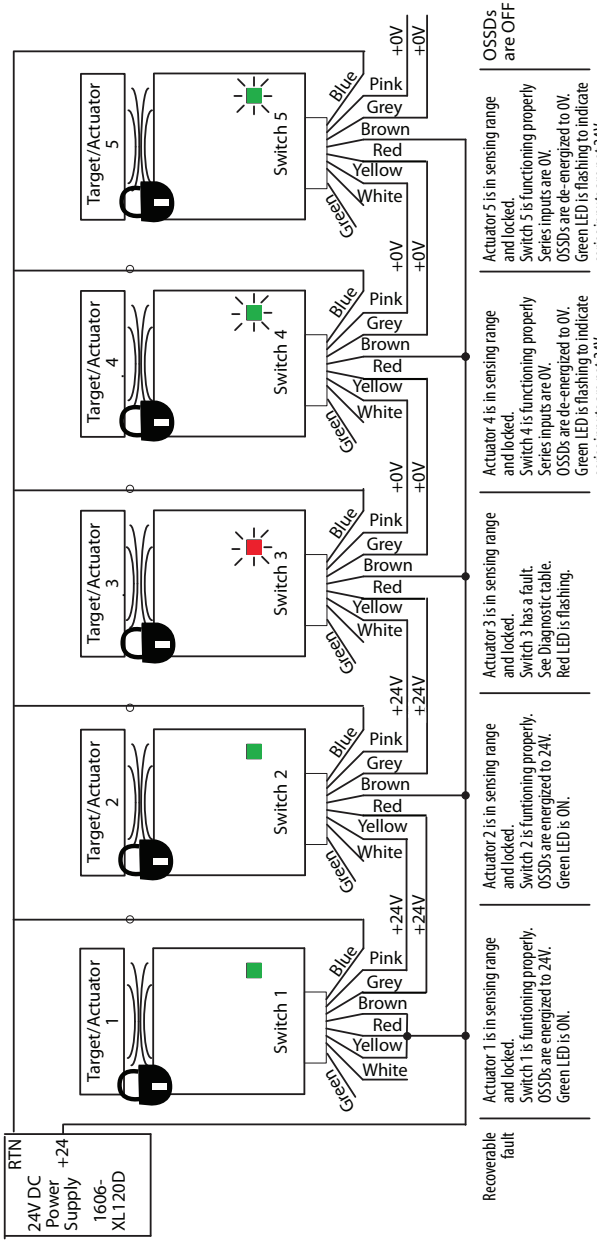
Status/Diagnostic LED Error Codes During the Learn Process.

These code sequences persist until a power off-on cycle is undertaken.

Status/Diagnostic LED - Flashes (4 Hz)	Error Code
Red-Red-Red-Green-Green	Target already learned
Red-Red-Red-Green-Green-Green	Bad RFID; target moved out of range
Red-Red-Red-Green-Green-Green-Green	Exceeded learning eight targets
Red-Red-Red-Green-Green-Green-Green-Green	Unit locked to One-Time learn; cannot learn another target

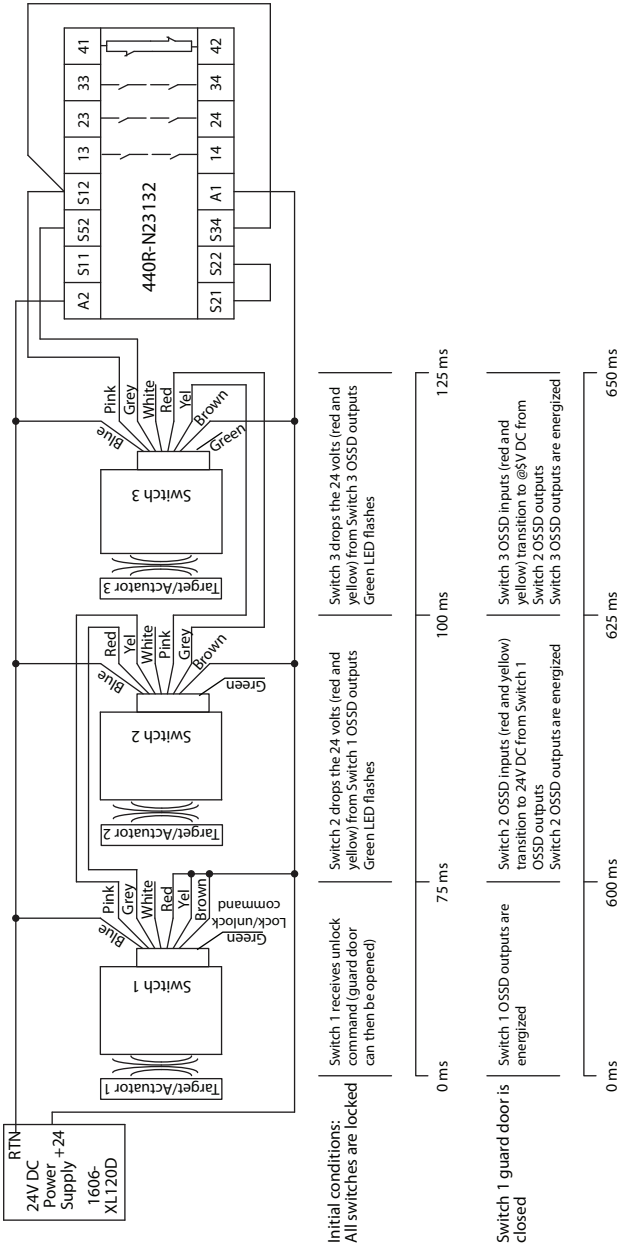
For operating Status/Diagnostic LED codes, see page 10.

Wiring Diagrams
Troubleshooting Series Circuit

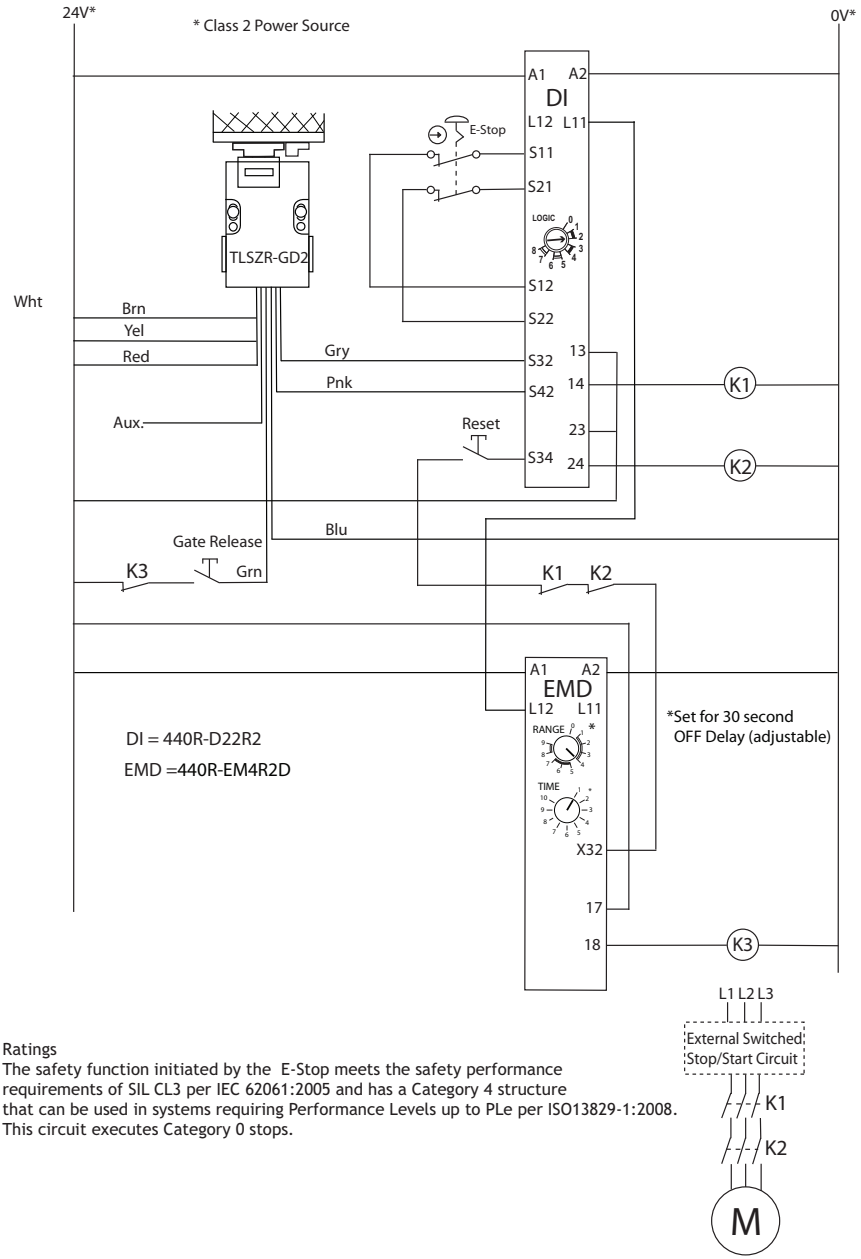


Unit Response Time

(Does not include relay response time)



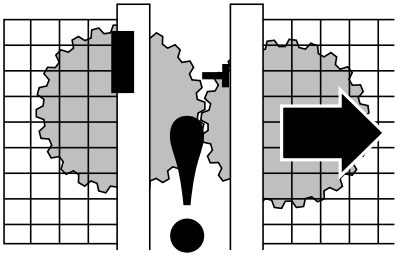
Application Wiring Example



Ratings
The safety function initiated by the E-Stop meets the safety performance requirements of SIL CL3 per IEC 62061:2005 and has a Category 4 structure that can be used in systems requiring Performance Levels up to PLe per ISO13829-1:2008. This circuit executes Category 0 stops.

Recommended Relays

Guardmaster safety relay family, (440R-D22R2, 440R-D22S2, 440R-S12R2, 440R-S13R2, 440R-GL4S2P, 440R-GL4S2T), MSR 57, MSR126, MSR127, MSR131, MSR138, MSR211, MSR320, SmartGuard, Safety PLC I/O



Check the machine is isolated and stopped whenever the interlocked guard door is open.

IMPORTANT: After installation and commissioning, the actuator, switch and switch lid fixing screws should be coated with tamper evident varnish or similar compound.

Maintenance

Monthly

Check the correct operation of the switching circuit. Also check for signs of abuse or tampering. Inspect the switch casing for damage

Repair

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

CE Declaration of Conformity

Rockwell Automation hereby declares that TLSZR/L-GD2 is in conformity with Directive 2004/108/EC, 2006/42/EC as specified in the Declaration of Conformity available from www.rockwellautomation.com/products/certification.

www.rockwellautomation.com

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