

Installation Instructions

Original Instructions



Allen-Bradley

by ROCKWELL AUTOMATION



Minotaur MSR117T Safety Relay

Catalog Numbers 440R-B23211

Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Page
Updated Response time	1

Introduction

This device is intended to be part of the safety-related control system of a machine.

IMPORTANT Before installation, perform a risk assessment 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. At regular intervals during the life of the machine, check whether the characteristics foreseen remain valid.



WARNING: Danger of serious injuries. Misuse can result in malfunction.

- Only authorized and trained personnel can start up, assemble, or retrofit the device.
- Installation must be in accordance with the following steps.



WARNING: Danger of serious injuries. Incorrect installation or manipulation can result in serious injuries. Do not defeat, tamper, remove, or bypass this unit.



ATTENTION: If any malfunction or damage is present, do not attempt to repair. Replaced the unit before machine operation is allowed. Do not dismantle the unit.

Rockwell Automation does not accept responsibility for the failure of this device if you do not implement the procedures that are given in this publication, or if you use the unit outside the recommended specifications that are listed in this publication.

IMPORTANT The safety inputs of these products 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. You must prevent exposure to shock and/or vibration in excess of those specifications in IEC 60068 part: 2-6/7. Adherence to the recommended inspection and maintenance instructions forms part of the warranty.

IMPORTANT All information complies with the state of this publication and is subject to change without notice.

Description

The unit can connect to safety gate switches or E-stop buttons and requires a supply voltage that is applied via the safety device to operate this safety relay. There are three N.O. safety outputs, plus one N.C. auxiliary for control indication.

If the input switch is closed and the supply is on A1-A2, the MSR117T safety relay is ready for operation and the PWR status indicator is on. The MSR117T safety relay can now be activated via the reset (feedback loop) circuit X1-X2. The safety contacts 13-14 and 23-24 and 33-34 close and enable operation, signaled by the second status indicator.

One N.C. contact respectively of the connected contactors or expanders has to be wired in series into the feedback circuit X1-X2 and is used for monitoring contactor function so that MSR117T safety relay start is feasible only if the contactors are at rest and their N.C. contacts are closed. If X1-X2 is closed at the time when voltage is supplied at A1-A2, the unit performs an automatic reset.

Specification

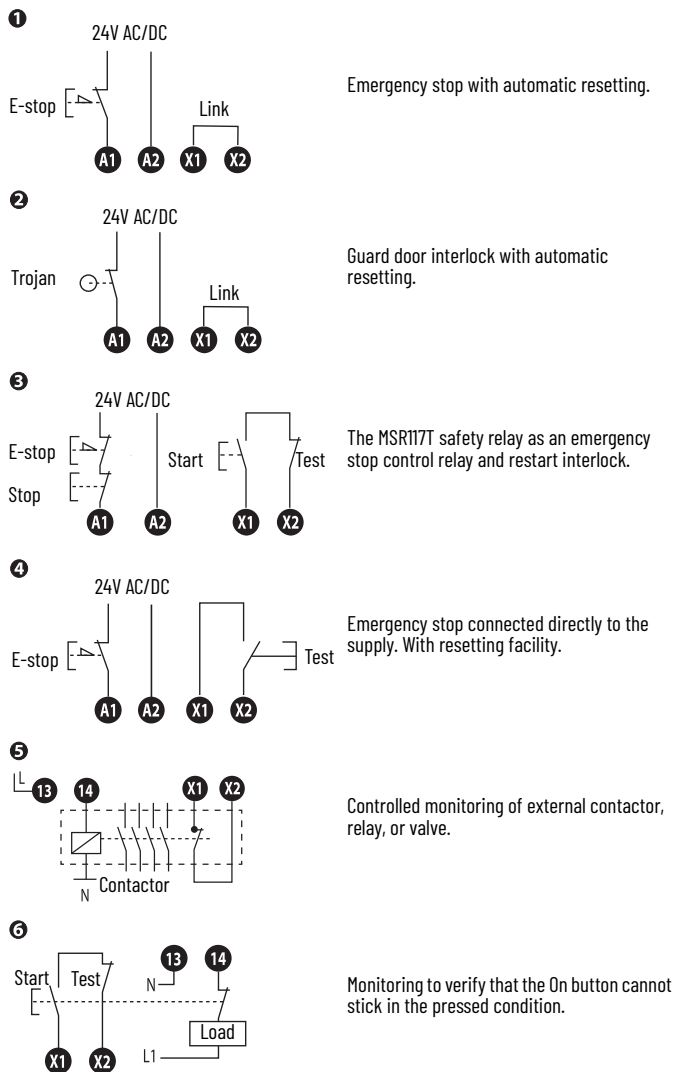
Attribute	Value
	According to ISO 13849-1: <ul style="list-style-type: none">• PL_e, Cat. 4• MTTF_d[a]: 432• DC average: 97%
Functional safety data	According to IEC 62061 and IEC 61508: <ul style="list-style-type: none">• SIL CL 3• PFH [1/h]: 2451E-10• HFT: 1• DC: 97%
	<ul style="list-style-type: none">• TM (PTI)[a]: 20• dop [d]/hop [h]⁽¹⁾: 365/24• tcycle [h]/[s]⁽²⁾: 8/28,800
Power supply	24V AC/DC 0.85...1.1 x rated voltage 50/60 Hz
Power consumption	2 W
Safety inputs	1 N.C.
Input simultaneity	Infinite
Allowable input resistance, max	25 Ω
Reset	Manual monitored or automatic/manual
Outputs	3 N.O. safety, 1 N.C. auxiliary
Output rating	<ul style="list-style-type: none">• UL: 3 x C300 or 2 x B 300, R300• 3 x 4 A or 2 x 5 A• AC-15: 5 A/250V AC• DC-13: 3 A/24V DC
Fuses output (external)	6 A slow blow or 10 A quick blow
Switched current/voltage, min	10 mA/10V
Contact material	AgSnO ₂ + 0.5μAu
Electrical life (operations)	<ul style="list-style-type: none">• 100,000 (220V AC/4 A/880VA cosφ = 0.35)• 500,000 (220V AC/1.7 A/375VA cosφ = 0.6)• 1,000,000 (30V DC/2 A/60 W)• 2,000,000 (10V DC/0.01 A/0.1 W)
Mechanical life	10,000,000 cycles
Power on delay	110 s
Response time	40 ms
Impulse withstand voltage	2500V
Pollution degree	2

Attribute	Value
Installation group	Overvoltage category III, VDE 0110-1
Operating temperature	-5...+55 °C (23...131 °F)
Relative humidity	90%
Enclosure protection rating	IP40 (NEMA 1)
Terminal protection rating	IP20
Wiring	Use copper that withstands 60/75 °C (140/167°F)
Conductor size	0.2...2.5 mm ² (24...12 AWG)
Torque settings	Terminal screws: 0.8 N·m (7 lb·in)
Case material	Polyamide PA 6.6
Mounting	35 mm (1.38 in.) DIN rail in enclosure to a minimum of IP54
Weight	180 g (0.40 lb)
Vibration	10...55 Hz, 0.35 mm (0.01 in.)

- (1) Operation time (day, hour)
- (2) Cycle time (hour, sec)

Application Examples

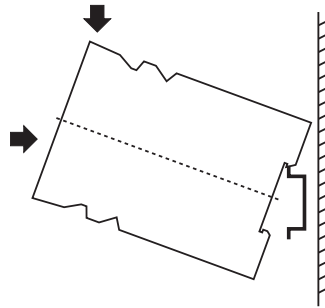
Only input connections shown.



Installation

Do not install this product until the installer obtains a copy of the instructions of the manufacturer, in a language that they can understand. This instruction publication is available in multiple languages at rok.auto/literature.

Figure 1 - Mounting



Mount the enclosure to a minimum of IP54.

Wiring

Wiring Examples

Figure 2 - Example 1

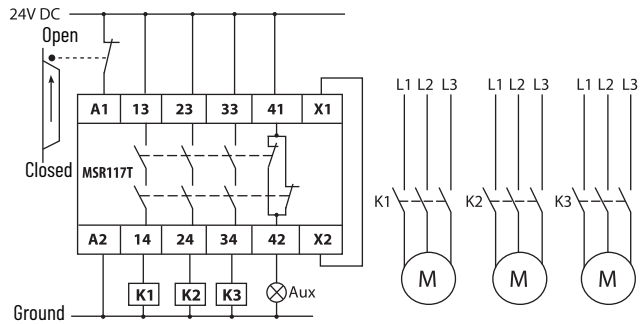


Figure 2 shows two-hand control, dual-channel, auto reset, and output monitoring.

Figure 3 - Example 2

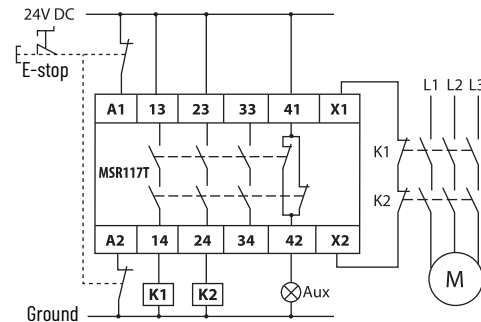
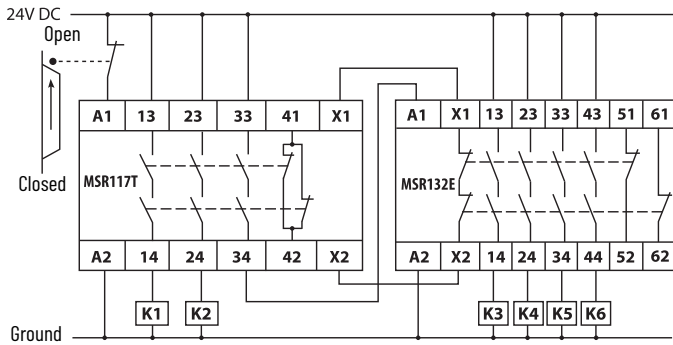


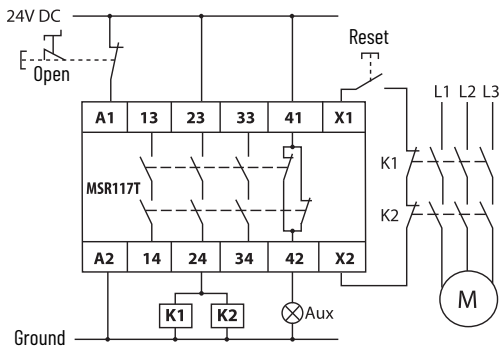
Figure 3 shows two-hand control, dual-channel, auto reset, and no output monitoring.

Figure 4 - Example 3



Single channel gate interlock, automatic reset, monitored output expansion with MSR132.

Figure 5 - Example 4



Single channel E-stop, manual reset, dual channel monitored output.

Circuit Diagram

Figure 6 - Diagram

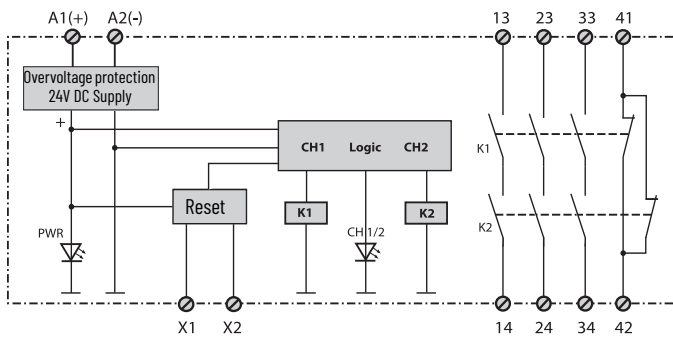
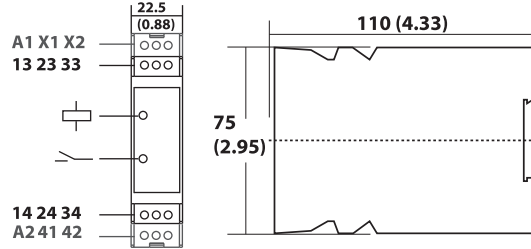


Table 1 - Circuit Diagram Explanation

Abbreviation	Description
A1, A2	Power
13, 23, 33, 14, 24, 34	Safety output (N.O.)
X1, X2	Monitoring feedback loop incorporating reset button
41, 42	Auxiliary output (N.C.)
PWR	Status indicator illuminates green when the unit is powered, flashing green if cross-loop faults occur
	Status indicator illuminates when K1 and K2 are closed

Approximate Dimensions

Figure 7 - Dimensions [mm (in.)]

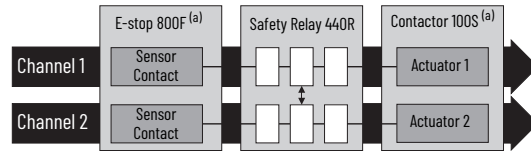


Safety Specifications

The MSR117T safety relay can be used in safety circuits according to DIN EN 60204-1/VDE 0113 part 1. Safety requirements that are specified in [Specification on page 1](#) are maximum, based on the operation mode and wiring.

Specifications are applicable only if the safety function is demanded at least once within 6 months. Conduct all diagnostic tests at least before the next demand, as mission time (TM) the proof test interval (PTI) is assumed. Components failure rates are according to SN29500.

Figure 8 - Safety Circuit



(a) Example

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) and EMC Directive 2014/30/EU.

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 the Supply of Machinery (Safety) Regulations (2008 No. 1597) and Electromagnetic Compatibility Regulations (2016 No. 1091).

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

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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

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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.

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Publication 440R-IN084B-EN-P - October 2022 | Supersedes Publication 440R-IN084A-EN-P - July 2022
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