

Installation Instructions

Original Instructions



Allen-Bradley

by ROCKWELL AUTOMATION



Minotaur MSR125H/HP Monitoring Safety Relay

Catalog Numbers MSR125HP: 440R-D23168, D23169, D23170, D23171; MSR125H: 440R-D23163, D23164, D23166

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.

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Updated Declaration of Conformity	3

Introduction

Only suitably competent personnel must install the Minotaur™ MSR125H/HP safety relay in accordance with the following steps. This device is intended to be part of the safety-related control system of a machine.

Rockwell Automation does not accept responsibility for 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 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 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: Do not defeat, tamper, remove, or bypass this unit. Severe injury to personnel could result.

IMPORTANT All information complies with the state of this publication. Subject to change without notice.



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

Description

If both the two-hand control switches installed on the machine are activated within 0.5 s, the two N.O. contacts close the relay and activate the connected press. If one or both of the two-hand control switches release, the two N.O. contacts open immediately, which stops the press movement.

If the period between operation of the two-hand control switches is >0.5 s, the output contacts of the MSR125H/HP safety relay do not activate. When this action happens, the MSR125H/HP safety relay will only execute the switching function after the operator releases both the two-hand control switches. The operator must then activate both control switches as normal to activate the press. Y1-Y2 verify the functioning of the downstream contactors. One N.C. contact of each contactor must connect in series to Y1-Y2. Those N.C. contacts must be suitable for low current. No maintenance is required when you use the unit properly.

Specifications

Attribute	Value
Functional safety data	According to ISO 13849-1: <ul style="list-style-type: none"> • PL_e, Cat. 4 • MTTF_d [a]: 456 • DC average: 98%
	According to IEC 62061 and IEC 61508: <ul style="list-style-type: none"> • SIL CL 3 • PFH [1/h]: 231E-10 • HFT: 1 • DC: 98%
	<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, 24V DC, 115V AC, 230V AC 0.85...1.1 x rated voltage 50/60 Hz
Power consumption	2 W
Safety inputs	2 N.C., 2 N.O.
Input simultaneity	Infinite
Allowable input resistance, max	40 Ω
Reset	Automatic
Outputs	2 N.O. safety
Output rating	<ul style="list-style-type: none"> • UL: B 300, R300 • 8 A/250V AC, 6 A/24V DC, 30V DC res. • AC-15: 6 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	1 s
Response time	20 ms
Recovery time	500 ms
Impulse withstand voltage	2500V
Pollution degree	2
Installation group	Overvoltage category III, VDE 0110-1
Operating temperature	-5...+55 °C (23...131 °F)
Relative humidity	90%
Enclosure protection	IP40 (NEMA 1)
Terminal protection	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: 0.6...0.8 N•m (5...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	24V AC/DC: 210 g (0.463 lb) 115V AC or 230V AC: 260 g (0.573 lb)
Vibration	10...55 Hz, 0.35 mm (0.01 in.)

(1) Operation time (day, hour)

(2) Cycle time (hour, sec)

Characteristics

The ZH 1/456 regulations require that you properly determine and strictly maintain the distance between the control switches and the components that execute the dangerous closing movement. To maintain full safety, the distance between the control switches of the two-hand switch and the danger zone must be adequate. If you release one of both of the switch elements of the two-hand switch, the dangerous closing movement must either interrupt or complete before you can reach the danger zone. Standard EN 999 provides the following general formula for the calculation of the minimum safety distance:

$$S=K \times T+C$$

S	Minimum safety distance (mm) is measured from the danger zone to the reference point, reference line, or protection area.
K	Constant (mm/s) is derived from data on the approach speed of the body or body parts.
T	Aggregate response time (s).
C	Additional distance (mm) is based on the penetration into the danger zone before activation.

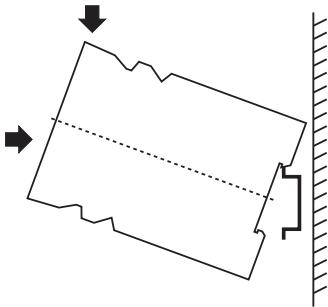
If machine-specific European standards require a safety distance different from what you calculate based on this standard, use the larger of the two values as the minimum safety distance. ZH 1/457 requires that all upstream and downstream contactors and relays must be fitted with positively driven contacts. You must also install the lockout device, stipulated in section 3.7. When the device interrupts, the control circuit must disconnect from the power supply. The MSR125H/HP safety relay conforms to the following Trade Association requirements for two-hand switching devices:

- Verification of the operation of both control switches within 0.5 s, max.
- Monitoring of the closing time of both control switches.
- Execution of the close command with self-monitoring circuitry.
- Verification of the contactors for press travel with an interlock on Y1-Y2.
- The interruption of an external line, a short circuit in a control switch line, or an internal relay malfunction (sticking of a relay contact) cannot trigger press travel.

Installation

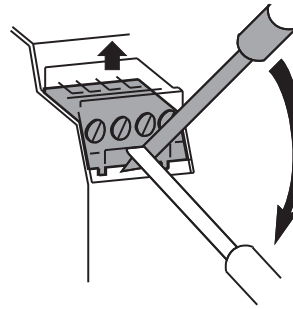
Do not install this product until the installer obtains a copy of the instructions of the manufacturer, in a language that they can understand. This instruction publication is available in multiple languages at rok.auto/literature.

Figure 1 - Mounting



Mount the enclosure to a minimum of IP54.

Figure 2 - Removable Terminals (P versions only)

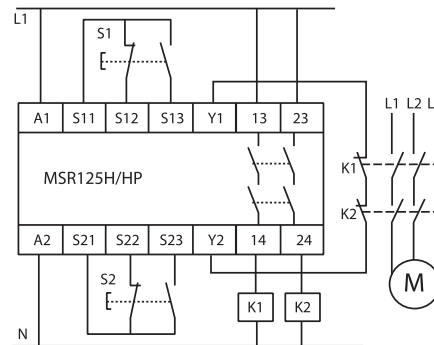


To remove the terminals, insert a screwdriver and slowly move as shown in [Figure 2](#).

Wiring

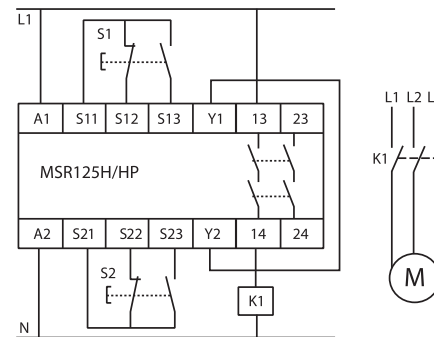
Wiring Examples

Figure 3 - Example 1



[Figure 3](#) shows two-hand control, dual-channel, auto reset, and output monitoring.

Figure 4 - Example 2



[Figure 4](#) shows two-hand control, dual-channel, auto reset, and no output monitoring.

Circuit Diagram

Figure 5 - Diagram

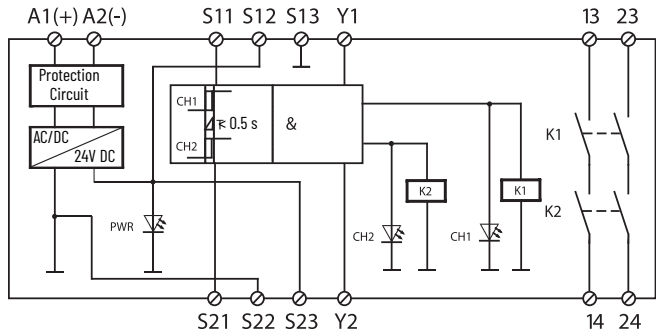


Table 1 - Circuit Diagram Explanation

Abbreviation	Description
A1, A2	Power
S11, S12, S13, S21, S22, S23	Safety input (N.C.)
Y1, Y2	Monitoring feedback loop incorporating auto reset
13, 14, 23, 24	Safety output (N.O.)
PWR	Status indicator illuminates green when the unit is powered, flashing green if cross-loop faults occur
CH1	Status indicator illuminates green when the safety output channel 1 activates
CH2	Status indicator illuminates green when the safety output channel 2 activates

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.

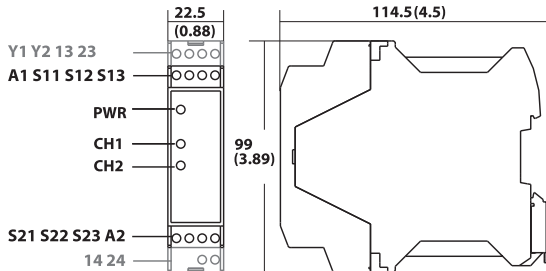
UKCA Conformity

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.

Approximate Dimensions

Figure 6 - Dimensions [mm (in.)]

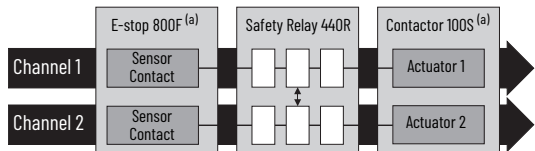


Safety Specifications

You can use the MSRI25H/HP safety relay in safety circuits according to DIN EN 60204-1/VDE 0113 part 1. Safety requirements that are specified in [Specifications 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. All diagnostic tests are conducted at least before next demand. The mission time (TM) for the proof test interval (PTI) is adopted. Components failure rates according to SN29500.

Figure 7 - Safety Circuit



(a) Example

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

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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-IN085A-EN-P - July 2022 | Supersedes Publication 440R-IN058A-MU-P - April 2011
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