

MA Series

Operating Instructions for MA-1, MA-2, MA-20, MA-21, MA-S2, MA-S20 & MA-S21 Safety Switches

KEEP THIS GUIDE FOR FUTURE REFERENCE

This information is designed to help suitably qualified personnel install and operate Omron Scientific Technologies, Inc. safety switch equipment.

Before using this product, read this guide thoroughly along with any relevant European and/or National Standards e.g. Machinery Directive 89/392/EEC and it's Amendments, Provision and Use of Work Equipment Regulations.

Further information can be obtained from
Omron Scientific Technologies, Inc.

Description

The MA- & MA-S are magnetically operated non-contact safety switches for use in machine guarding applications.

The non-contact operation makes these switches easy to install and tolerant to misalignment, providing a simple reliable solution to machine guard interlocking.

The MA is manufactured in a robust ABS housing and the MA-S is manufactured in a 316 Grade Stainless Steel. The switch and actuator are fully sealed to IP67 and can be used in wet or dusty environments

With correct installation, these safety switches comply with the guidelines given in EN1088.

Operation

When the safety switch and actuator are within the specified operating range (See table on page 4 for switching distances), the **Safety Contacts** will be closed and the **Auxiliary Contact** will be open.

When the actuator moves out of the operating range, the **Safety Contacts** will open, and the **Auxiliary Contact** will close for indication.

The MA and MA-S safety switch and actuator are designed to approach each other from most angles. When the guard is closed the targets on the printed face of the switch and actuator must be aligned.

Applications

Interlocked guards where door locking is not required.
Food and Beverage packing/filling systems
Dairy
Pharmaceutical
Paper Industry
Can Forming and Filling, (Aluminum, Steel, Plastic)
Semiconductor Manufacture/Assembly.

MA-S



MA



Approvals

CE	Complies with the relevant sections of the CE marking directive.
UL	UL 508, Industrial Control Equipment

EUROPEAN DIRECTIVES

Machinery Directive 98/37/EC
Low Voltage Directive 73/23/EC
Electromagnetic Compatibility Directive 89/336/EC

EUROPEAN STANDARDS

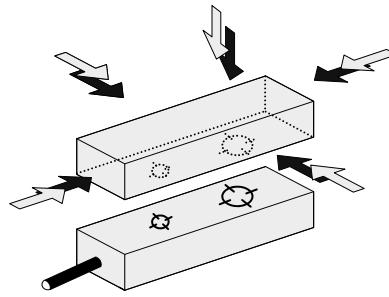
EN292	Safety of Machinery Basic concepts, general principles for design.
EN 60204	Safety of Machinery Electrical equipment of machines.
EN 954-1 EN ISO 13849-1	Safety of Machinery Safety related parts of controls systems
EN 1088	Interlocking devices associated with guards.
EN 60947-5-3	Safety of Machinery Specification for low voltage switchgear and control gear.

Declaration of Conformity

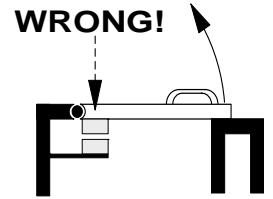
A Declaration of Conformity can be obtained from the Omron Scientific Technologies, Inc. web Site: www.sti.com

Mounting

The MA & MA-S safety switches can approach each other from most angles. When the guard is closed the targets on the printed face of the switch and actuator must be aligned.



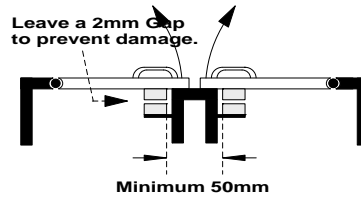
Mount the switch on to the machine frame and the actuator on to the opening edge of the door. Always try to mount the switch on non-ferrous material. (*Ferrous materials may reduce the switching distance.*)



Use the tamper proof screws provided to make more secure.

Do not use the safety switch as a door stop.

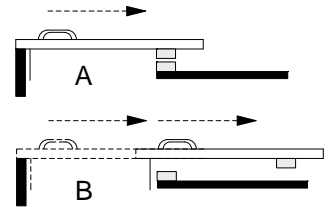
Leave a minimum of 50 mm between any adjacent switches.



EN 1088

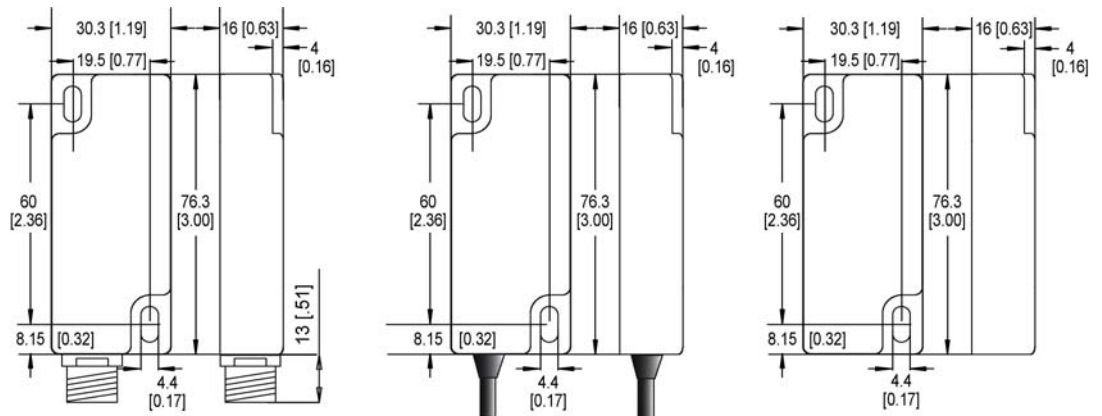
Provides some mounting suggestions, see example opposite.

When fixing the safety switch to a sliding door (A), ensure that when the door is opened (B) it is not easily accessible, helping prevent the system being overridden.



Dimensions

RED ABS
MA-1, MA-2,
MA-20, MA-21



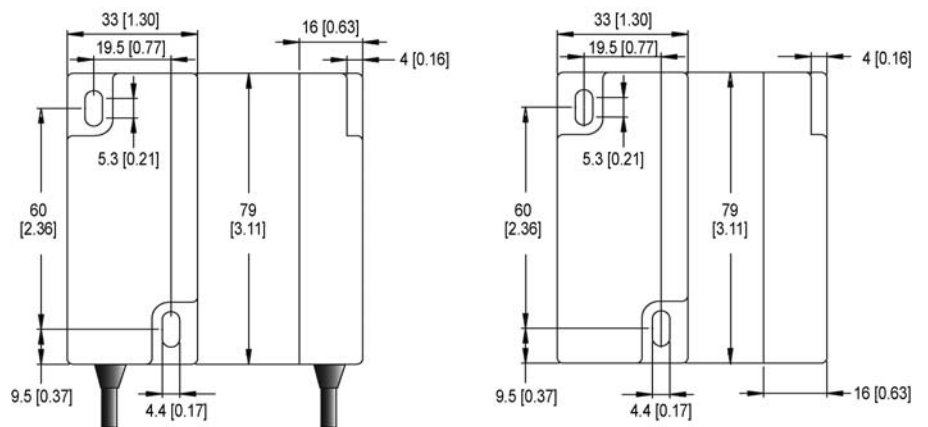
SWITCH

SWITCH

DIMENSIONS IN
MM [INCHES]

ACTUATOR

STAINLESS STEEL
MA-S2, MA-S20, MA-S21




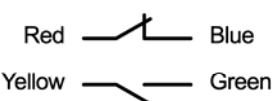
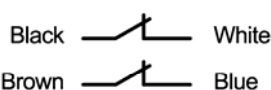
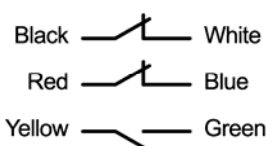
SWITCH

DIMENSIONS IN
MM [INCHES]

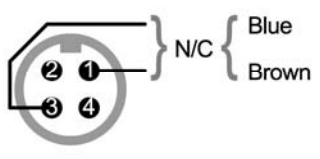
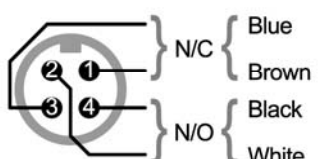
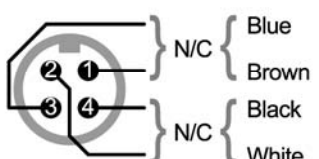
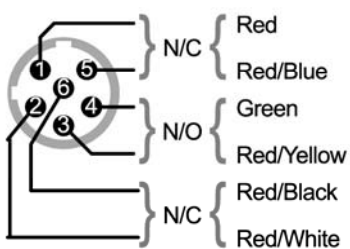
ACTUATOR

CONNECTIONS

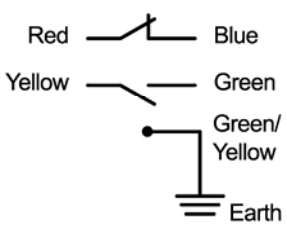
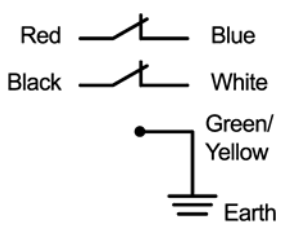
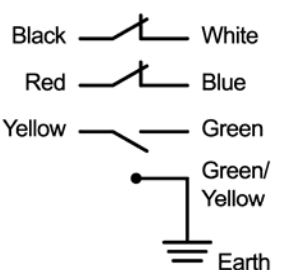
ABS - Pre-wired

MA-1 	MA-2 	MA-20 	MA-21 
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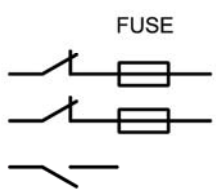
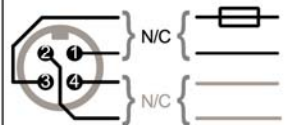
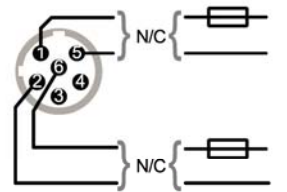
ABS - Connector

MA-1 Connector Contact Cable  Connector Micro DC M12	MA-2 Connector Contact Cable  Connector Micro DC M12	MA-20 Connector Contact Cable  Connector Micro DC M12	MA-21 Connector Contact Cable  Connector Micro AC 1/2" - 20
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Stainless Steel - Pre-wired

MA-S2 	MA-S20 	MA-S21 
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FUSES

Pre-Wired	Connector	Switch	Fuse	
			AC	DC
MA-1/2/20/21  All N/C Contacts	MA-1/2/20  MA-21  All N/C Contacts	ABS Pre-wired or Connector MA-1, MA-2, MA-20, MA-21	1.6A	0.8A
		Stainless Steel Pre-wired MA-S2, MA-S20, MA-S21	1.6A	0.8A

All external fuses should be a 'FAST ACTING'

Technical Specifications

		AC Switching	DC Switching
Contact Arrangements	MA-21; MA-S21	2 x N/C + 1 x N/O	
	MA-20; MA-S20	2 x N/C	
	MA-2; MA-S2	1 x N/C + 1 x N/O	
	MA-1	1 x N/C	
Safety Contact Rating		230Vac / 2Amps	30Vdc / 1Amp Inductive/Resistive
Safety Contact Operating Distance		10mm ON / 30mm OFF	
Safety Contact Close/Drop/Bounce		3ms / 2.1ms / 0.7ms	
Auxiliary Contact Rating		15W / 10VA	
Auxiliary Contact Operating Distance		7mm OFF / 20mm ON	
Auxiliary Contact Close/Drop/Bounce		0.5ms / 0.3ms / 0.7ms	
Internal Fuse		2Amp Fast Acting	1Amp Fast Acting
External Fuse (Customer Supplied)		1.6 Amps Fast Acting	0.8 Amp Fast Acting
IP Rating		IP67	
Vibration / Shock		50—100Hz / 10g	
Operating Temperature	Pre-wired, Stainless Steel	MA-S2, MA-S20 MA-S21	- 10°C to + 95°C
	Pre-wired, ABS	MA-1, MA-2, MA-20, MA-21	- 10°C to + 55°C
	Quick Disconnect	All models	- 10°C to + 55°C
Mounting & Fixture		Target to Target	
Connection		Pre-wired or Quick Disconnect	
Construction	MA	Red ABS	
	MA-S	316 Grade Stainless Steel	

Specification Changes

In the interest of product development, specifications are subject to change without notice.

Note

The safety contacts of the Omron Scientific Technologies, Inc. switches are described as normally closed (N/C) i.e. With the guard closed, actuator in place, and the machine able to be started.



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