

MA Series

Operating Instructions for MA-16 & MA-36 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-16 & MA-36 safety switches are magnetically operated non-contact safety switch 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-16 is manufactured in a robust ABS housing and MA-36 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 3 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-16 and MA-36 safety switch and actuator are designed to approach each other from most angles. When the switch is closed the targets on the printed face of the switch 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-16

MA-36



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

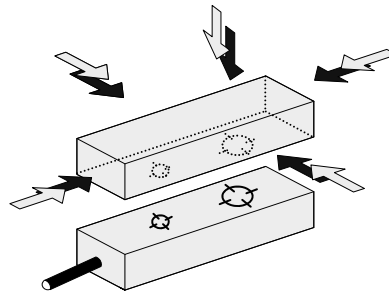
EN292	Safety of Machinery Basic concepts, general principles for design.
EN 60204	Safety of Machinery Electrical equipment of machines.
EN 954-1	Safety of Machinery Safety related parts of controls systems
EN 1088	Interlocking devices associated with guards.
EN 60947-5-3	Safety of Machinery Specification 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-16 & MA-36 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.

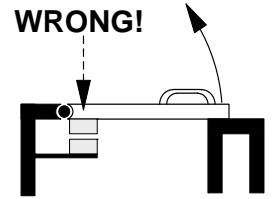
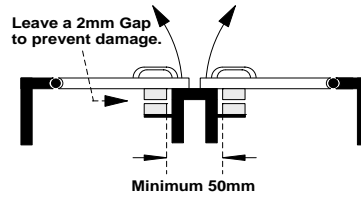


Mount the switch on to the machine frame and the actuator on to the opening edge of the door. Always try to mount the switch on non-ferrous material. (*Ferrous materials may reduce the switching distance.*)

Use the tamper proof screws provided to make more secure.

Do not use the safety switch as a door stop.

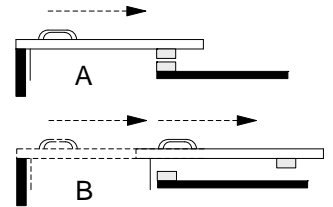
Leave a minimum of 50 mm between any adjacent switches.



EN 1088

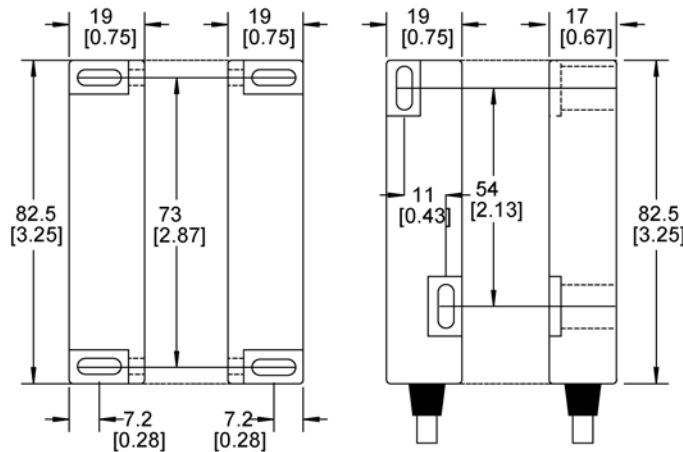
Provides some mounting suggestions, see example opposite.

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

MA-16 RED ABS HOUSING

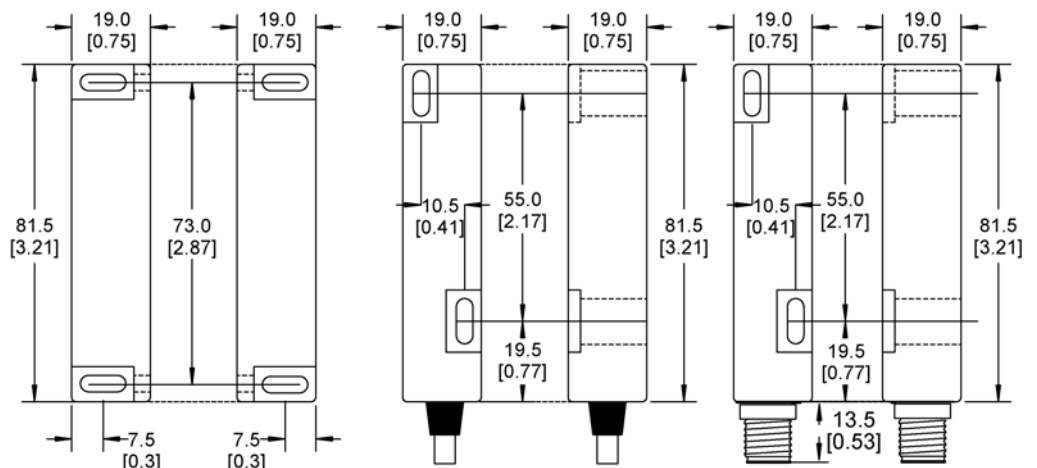


Dimensions in mm and
[inches in brackets]

ACTUATOR

SWITCH

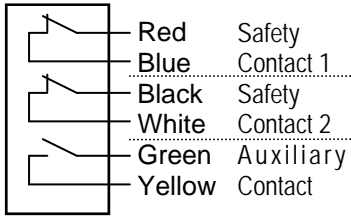
MA-36 STAINLESS STEEL HOUSING



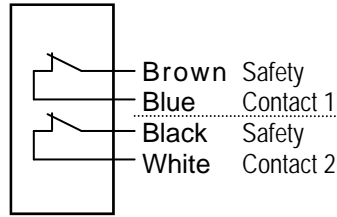
Contacts & Connections

ABS

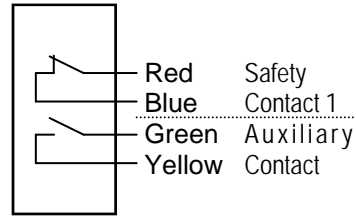
MA-16AP21C3 / MA-16AP21C6
MA-16DP21C3 / MA-16DP21C6



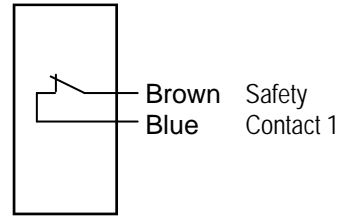
MA-16AP20C3 / MA-16AP20C6
MA-16DP20C3 / MA-16DP20C6



MA-16AP11C3 / MA-16AP11C6
MA-16DP11C3 / MA-16DP11C6

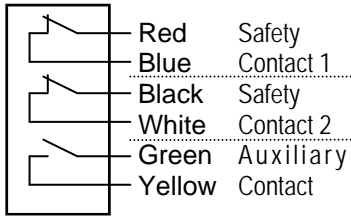


MA-16AP10C3 / MA-16AP10C6
MA-16DP10C3 / MA-16DP10C6

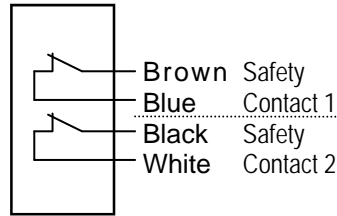


Stainless Steel

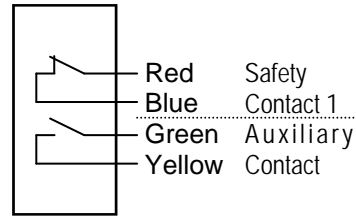
MA-36DS21C3



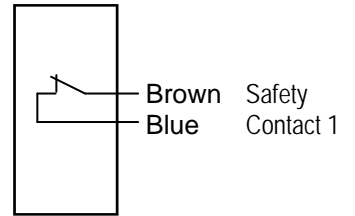
MA-36DS20C3



MA-36DS11C3

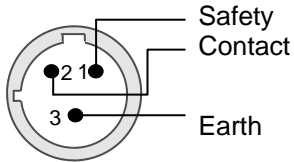


MA-36DS10C3 / MA-36DS10C6



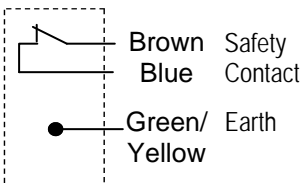
Quick Disconnect

MA-36AS10CC
MA-36AS10CC5



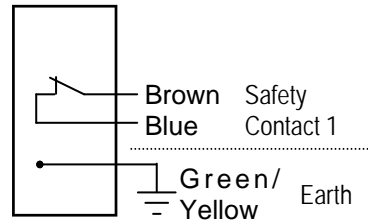
3 pin, micro dual key-way,
1/2"-20 UNF

Cable



AC Switching

MA-36AS10C3
MA-36AS10C6



External Fusing

	AC	DC
MA-16 & MA-36	1.6 Amps	0.8 Amps

Technical Specifications

		AC Switching	DC Switching
Contact Arrangements	2 x N/C + 1 x N/O	MA-16AP21C3 / MA-16AP21C6	MA-16DP21C3 / MA-16DP21C6 MA-36DS21C3
	2 x N/C	MA-16AP20C3 / MA-16AP20C6	MA-16DP20C3 / MA-16DP20C6 MA-36DS20C3
	1 x N/C + 1 x N/O	MA-16AP11C3 MA-16AP11C6	MA-16DP11C3 / MA-16DP11C6 MA-36DS11C3
	1 x N/C	MA-16AP10C3 / MA-16AP10C6 MA-36AS10C3 / MA-36AS10C6 MA-36AS10CC / MA-36AS10CC5	MA-16DP10C3 / MA-16DP10C6 MA-36DS10C3 / MA-36DS10C6
Safety Contact Rating		230Vac / 2Amps	30Vdc / 1Amp Inductive/Resistive
Safety Contact Operating Distance		10mm ON / 30mm OFF	10mm ON / 30mm OFF
Safety Contact Close/Drop/Bounce		3ms / 2.1ms / 0.7ms	3ms / 2.1ms / 0.7ms
Auxiliary Contact Rating		15W / 10VA	15W / 10VA
Auxiliary Contact Operating Distance		7mm OFF / 20mm ON	7mm OFF / 20mm ON
Auxiliary Contact Close/Drop/Bounce		0.5ms / 0.3ms / 0.7ms	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	IP67
Vibration / Shock		50—100Hz / 10g	50—100Hz / 10g
Operating Temperature		-10 to +55C	-10 to +55C
Mounting & Fixture		Target to Target	Target to Target
Connection		Pre-wired or Quick Disconnect	Pre-wired or Quick Disconnect
Construction		Red ABS Resin Filled or 316 Grade Stainless Steel (SS)	Red ABS Resin Filled or 316 Grade Stainless Steel (SS)

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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