

MA Series

CAUTION

This information is designed to help suitably qualified personnel install and operate STI 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
STI

***** KEEP THIS GUIDE FOR FUTURE REFERENCE *****

DESCRIPTION

The MA Series safety switch is a magnetically operated non-contact safety switch for use in machine guarding applications. With correct installation, MA Series safety switches comply with the guidelines given in EN1088.

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

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

MA Series safety switches 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.

Note:
The safety contacts of the STI switches are described as normally closed (N/C)

i.e., with the guard closed, actuator in place, and the machine able to be started.

APPLICATIONS

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



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

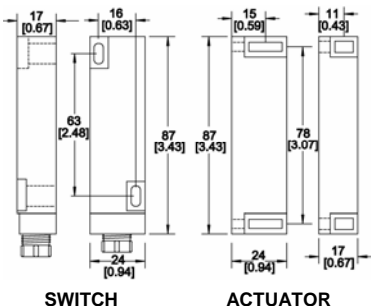
EN292	Safety of Machinery Basic concepts, general principles for design.
EN 60204	Safety of Machinery Electrical equipment of machines.
EN 954-1	Safety of Machinery Safety related parts of controls systems
EN 1088	Interlocking devices associated with guards.
EN 60947-5-3	Safety of Machinery Specification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

CERTIFICATE OF CONFORMITY

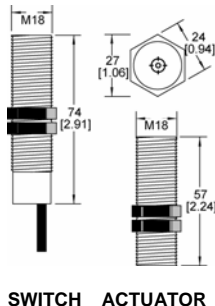
A Declaration of Conformity may be obtained from the STI web site, www.sti.com

DIMENSIONS

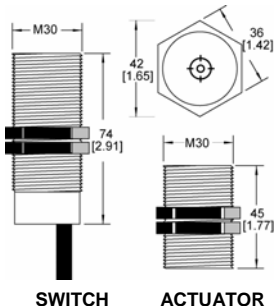
MA 11



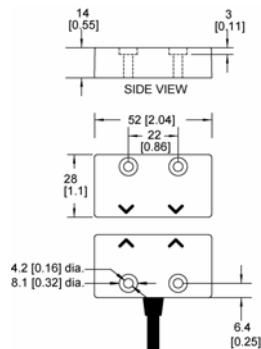
MA 12



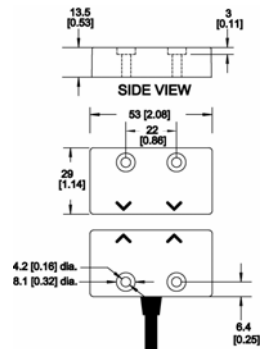
MA 13



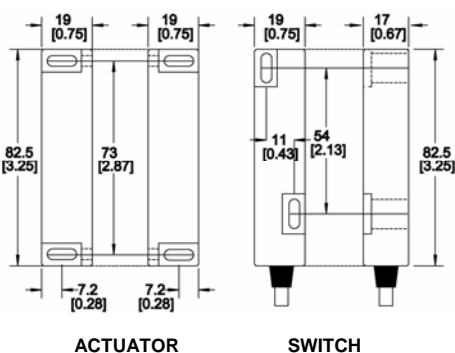
MA 14 / MA 15



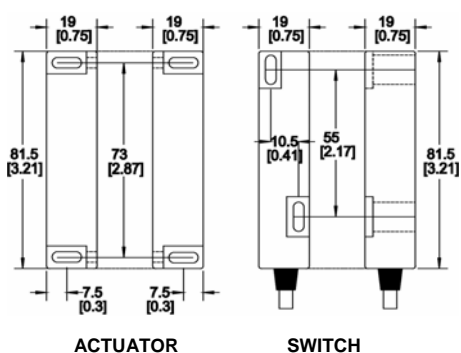
MA 34 / MA 35 (Stainless Steel)



MA 16



MA 36 (Stainless Steel)



CONTACT ARRANGEMENTS

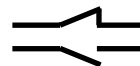
MA 11, MA 13
MA 15 (Low Current)
MA 16



MA 11, MA 13, MA 16,
MA 36



MA 11, MA 12, MA 13,
MA 14, MA 16, MA 36

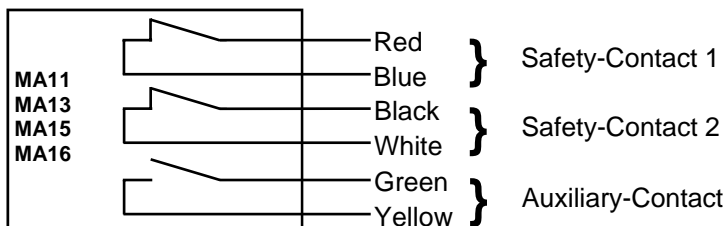


MA 11, MA 12, MA 13,
MA 14, MA 16, MA 36

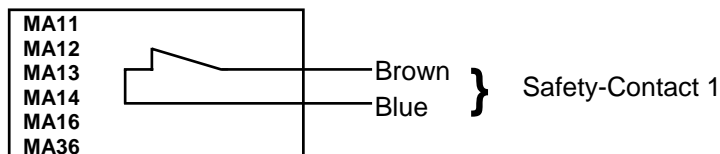


CONNECTIONS AND FUSES

2 x N/C + 1 x N/O Contacts :



1 x N/C Contact :



2 x N/C Contacts :



1 x N/C + 1 x N/O Contacts :



EXTERNAL FUSING :

All Safety contacts should be fused externally

	AC	DC
MA11	1.6 Amps	0.8 Amps
MA12	1.6 Amps	0.8 Amps
MA13	1.6 Amps	0.8 Amps
MA14	1.6 Amps	0.8 Amps
MA15	Not Available	0.2 Amps
MA16	1.6 Amps	0.8 Amps
MA36	1.6 Amps	0.8 Amps

Note : All contacts shown when actuator in place.

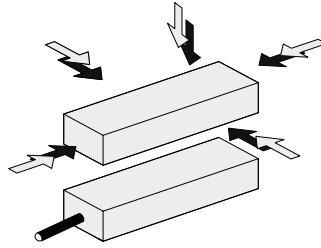
OPERATION

The MA Series safety switches can approach each other from most angles. When the switch is closed the targets on the printed face of the switch must be aligned.

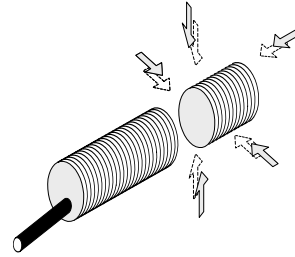
The **Safety Contacts** will be closed and the **Auxiliary Contacts** will be open when the switch and actuator are within the specified operating range. (See table on page 4)

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

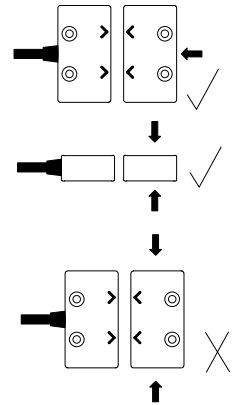
MA 11, MA16 & MA 36



MA 12 & MA 13



MA 14 & MA 15



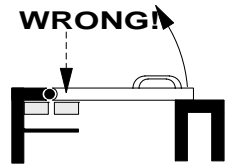
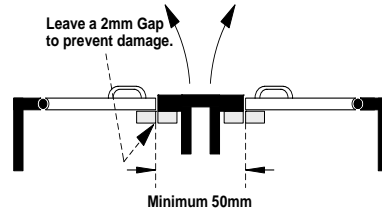
FIXING

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. Do not use the safety switch as a door stop.

Leave a minimum of 50 mm between any adjacent

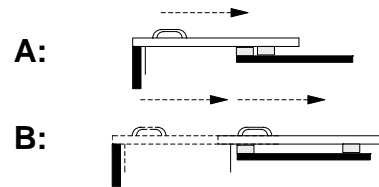


Do not mount the switch on to the hinge side of the door.

SLIDING DOORS

EN 1088 provides some mounting suggestions, see example opposite.

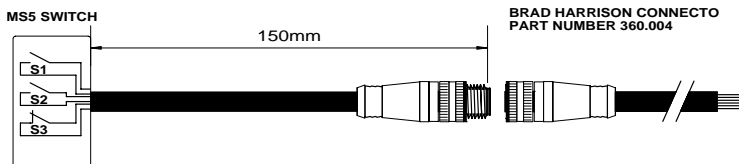
When fixing the safety switch to a sliding door (A), ensure that when the door is opened (B) it is not easily accessible, helping prevent the system being overridden.



QUICK DISCONNECT OPTIONS

MA-15DP21CC / MA-35DS21CC

The MA-15 & MA-35 are available with a M12/IP65 'Pig-Tail' connector option. Connector is 2 keyway.

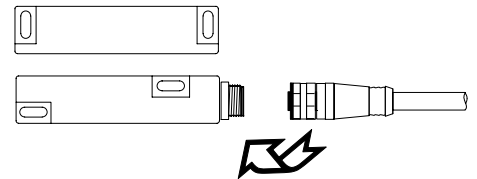


CONNECTION:

Cable connection colours on the MA15:
 Contact 1 N/C Red/Black & Red/White
 Contact 2 N/C Red & Red/Blue
 Contact 3 N/O Green & Red/Yellow
 Fuse 0.2 Amps (All contacts)

MA-36AS10CC5

The MA-36 AC version is available with a M12/IP65 3 Pole quick disconnect. Connector is 2 keyway.



CONNECTION:

Cable connection colours on the MA36:
 Contact 1 N/C Brown & Blue
 Earth Green/Yellow
 Fuse 1.6 Amps

TECHNICAL SPECIFICATIONS

Type	MA 11	MA 12	MA 13	MA 14 MA 34	MA 15 MA 35	MA 16 MA 36
Contact Arrangement	Max: 2 x N/C Safety 1 x N/O Auxiliary	Max: 1 x N/C Safety 1 x N/O Auxiliary	Max: 2 x N/C Safety 1 x N/O Auxiliary	Max: 1 x N/C Safety 1 x N/O Auxiliary	2 x N/C Safety 1 x N/O Auxiliary	Max: 2 x N/C Safety 1 x N/O Auxiliary
Safety Contact Rating	AC : 230Vac/2Amps DC: 30Vdc / 1Amp Inductive/Resistive	AC : 230Vac/2Amps DC: 30Vdc / 1Amp Inductive/Resistive	AC : 230Vac/2Amps DC: 30Vdc / 1Amp Inductive/Resistive	DC: 30Vdc / 1Amp Inductive/Resistive	DC: 24Vdc / 0.3Amps Inductive/Resistive	AC : 230Vac/2Amps DC: 30Vdc / 1Amp Inductive/Resistive
Safety Contact Operating Distance	10mm ON 25mm OFF	10mm ON 25mm OFF	10mm ON 25mm OFF	7-10mm ON 12 mm OFF	7mm ON 12mm OFF	10mm ON 25mm OFF
Safety Contact Close/Drop/Bounce	3ms / 2.1ms / 0.7ms	3ms / 2.1ms / 0.7ms	3ms / 2.1ms / 0.7ms	3ms / 2.1ms / 0.7ms	3ms / 2.1ms / 0.7ms	3ms / 2.1ms / 0.7ms
Auxiliary Contact Rating	15W / 10VA	15W / 10VA	15W / 10VA	15W / 10VA	15W / 10VA	15W / 10VA
Auxiliary Contact Operating Distance	8mm OFF 10mm ON	8mm OFF 10mm ON	8mm OFF 10mm ON	8mm OFF 10mm ON	8mm OFF 10mm ON	8mm OFF 10mm ON
Auxiliary Contact Close/Drop/Bounce	0.5ms / 0.3ms / 0.7ms	0.5ms / 0.3ms / 0.7ms	0.5ms / 0.3ms / 0.7ms	0.5ms / 0.3ms / 0.7ms	0.5ms / 0.3ms / 0.7ms	0.5ms / 0.3ms / 0.7ms
Internal Fuse	AC: 2Amp Fast Acting DC: 1Amp Fast Acting	AC: 2Amps Fast Acting DC: 1Amp Fast Acting	AC: 2Amp Fast Acting DC: 1Amp Fast Acting	DC: 1 Amp Fast Acting	-	AC: 2Amp Fast Acting DC: 1Amp Fast Acting
External Fuse (Customer Supplied)	AC : 1.6Amps Fast Acting DC : 0.8Amps Fast Acting	AC : 1.6Amps Fast Acting DC : 0.8Amps Fast Acting	AC : 1.6Amps Fast Acting DC : 0.8Amps Fast Acting	DC : 0.8 Amps Fast Acting	DC : 0.2Amps Fast Acting	AC : 1.6 Amps Fast Acting DC : 0.8 Amp Fast Acting
IP Rating	IP67	IP67	IP67	IP67	IP67	IP67
Vibration / Shock	50—100Hz / 10g	50—100Hz / 10g	50—100Hz / 10g	50—100Hz / 10g	50—100Hz / 10g	50—100Hz / 10g
Operating Temperature	-10 to +55C	-10 to +55C	-10 to +55C	-10 to +55C	-10 to +55C	-10 to +55C
Mounting & Fixture	Target to Target	Target to Target	Target to Target	Target to Target	Target to Target	Target to Target
Construction	Red ABS Resin Filled	Red ABS Resin Filled	Red ABS Resin Filled	Red ABS Resin Filled Or 316 Grade Stainless Steel Resin Filled	Red ABS Resin Filled Or 316 Grade Stainless Steel Resin Filled	Red ABS Resin Filled Or 316 Grade Stainless Steel Resin Filled

SPECIFICATION CHANGES

Specifications are subject to change without notice.

Note: The safety contacts of the STI switches are described as normally closed (N/C) i.e., with the guard closed, actuator in place, and the machine able to be started.

OMRON

STI

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