

Installation Guide for SSS, SS-R & SS-C Safety Switches

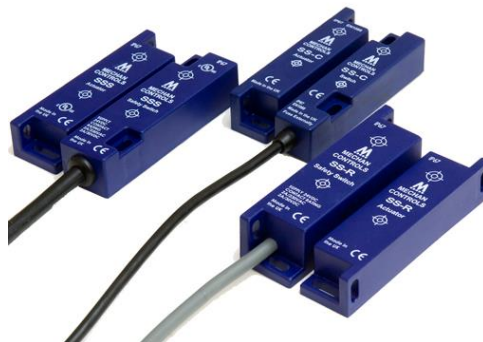
Description:

The S-Type safety switches are electronic, non-contact, safety switch and actuator, suitable for use in machine guarding.

The S-Type safety switches are designed to be used in part of safety related control system.

A risk assessment should take place to establish that the specifications of these safety switches are suitable for the application required.

See Technical Specifications below or contact Mechan Controls for further information.



KEEP THIS GUIDE FOR FUTURE REFERENCE

The information is designed to help suitably qualified personnel install and operate Mechan Controls safety equipment. Before using this product, read this guide thoroughly along with any relevant European and/or National Standards E.g. Machinery Directive 2006/42/EC and its Amendments, Provision and Use of Work Equipment Regulations. **Further information can be obtained from Mechan Controls Plc.**

| Technical Specifications | SSS | SS-R | SS-C |
|-----------------------------------|---|---|---|
| Supply | 24Vdc | 24Vdc | 24Vdc |
| Contacts | 2 NO or 1 NO + 1 NC | 2 NO + 1 NC | 2 NO or 1 NO + 1 NC or 1 NO |
| Safety Contact Rating | 230Vac / 2A or 30Vdc / 2A | 230Vac / 2A or 30Vdc / 2A | 110Vac / 500mA or 24Vdc / 500mA |
| Safety Contact Switching | 7mm ON / 11mm OFF | 7mm ON / 11mm OFF | 7mm ON / 11mm OFF |
| Auxiliary Contact Rating | 230Vac / 2A or 30Vdc / 2A | 230Vac / 2A or 30Vdc / 2A | 110Vac or 24Vdc / 500mA |
| Auxiliary Contact Switching | 7mm OFF / 11mm ON | 7mm OFF / 11mm ON | 7mm OFF / 11mm ON |
| Internal Fuse | - | - | 1 Amp Fast Acting |
| External Fuse (customer supplied) | 3 Amps Fast Acting | 3 Amps Fast Acting | 0.3 Amps Fast Acting |
| Indication | Green LED | Red/Green LED | Red/Green LED |
| Construction | Blue ABS, Resin Filled | Blue ABS, Resin Filled | Blue ABS, Resin Filled |
| IP Rating | IP67 | IP67 | IP67 |
| Operating Temperature | -25°C to +55°C | -25°C to +55°C | -25°C to +55°C |
| Fixing | M4 Torx security screws, Tightening 1.0NM | M4 Torx security screws, Tightening 1.0NM | M4 Torx security screws, Tightening 1.0NM |
| Connection | Pre-wired or M12 Leaded Quick Disconnect | Pre-wired or M12 Leaded Quick Disconnect | Pre-wired or M12 Leaded Quick Disconnect |

Safety Related Data

| | | | |
|-------------------|------------|------|---------------------------------|
| B10d | 2,000,000 | PFH | 6.52×10^{-8} |
| TM (Mission Time) | > 20 Years | PFHd | 4.3×10^{-8} See Note 1 |
| DC | 99% | SFF | 99% |

MTTFd High > 100 Years (based on usage rate of 360 days/year, 24 hours/day, 10 Operations/hour)

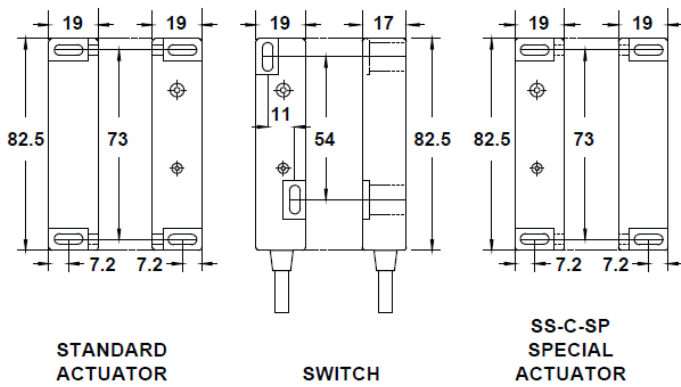
Note 1 Based on dual channel wiring according to CAT 4. Diagnostic coverage provided by downstream control logic. DC - medium, MTTFd = 100 Years. Suitable for performance level applications PLe according to ISO 13849-1. (SIL 3 or SIL 2 according to IEC 62061)

Safety Standards

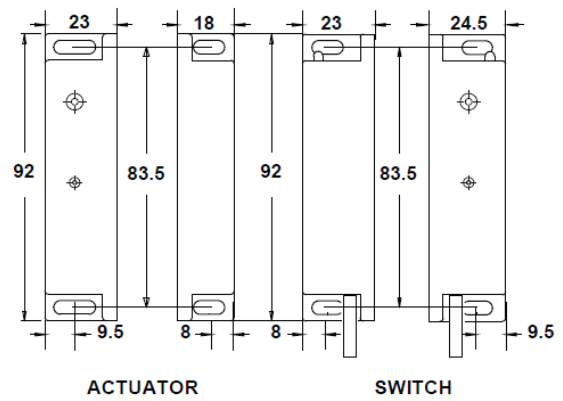
| | |
|--------------------------|---|
| Approvals | CE Complies with all relevant sections of the CE Marking Directive |
| | UL 508 Industrial Control, TUV Approved |
| International Directives | Machinery Directive 2006/42/EC, Low Voltage Directive 2006/95/EC; EMC Directive 2014/30/EU, RoHS Directive 2011/65/EC |
| International Standards | BS EN 12100 Safety of Machinery. General principles for design. |
| | BS EN ISO 14119 Safety of Machinery. Interlocking devices associated with guards. |
| | BS EN ISO 13849 Safety of Machinery. Safety related parts of control systems. |
| | BS EN ISO 62061 Safety of Machinery. Functional safety of safety related electrical, electronic and programmable electronic control systems |
| | BS EN 60204 Safety of Machinery. Electrical equipment of machines. |
| | BS EN 60947-5-1 Low-voltage switchgear and controlgear. |
| | BS EN 60947-5-3 Low-voltage switchgear and controlgear. |

Dimensions

SS-C

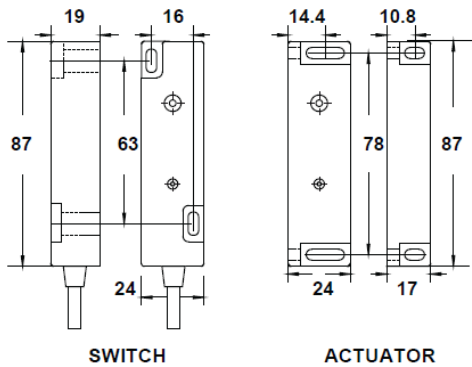


SS-R



SSS

All dimensions in MM



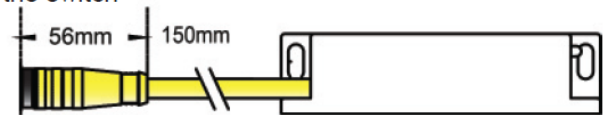
SSS QD

M12 Quick Disconnect mounted in the switch body.



SS-C & SS-R LQD

M12 Leaded quick disconnect with 150mm connecting lead to the switch

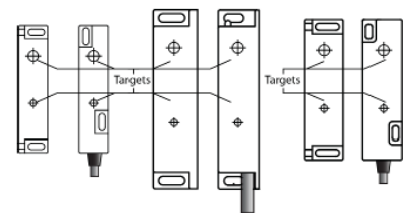
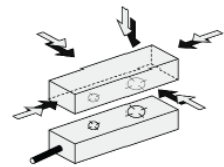


Operation

Mechan S-Type safety switches can approach each other from most directions.

When closed the targets printed on the front face of the switches must be aligned. Large target to large target and small target to small target as shown opposite.

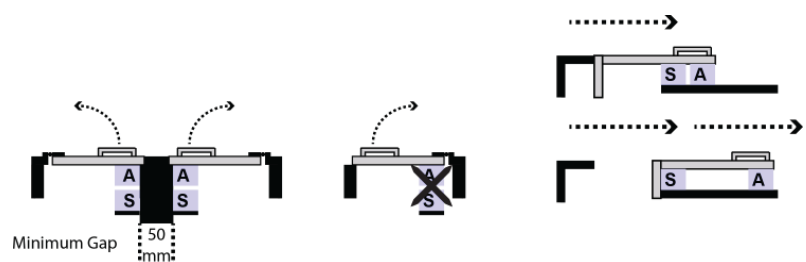
When the power is on and the switch and actuator are apart the NO contact(s) will be open and the NC contact will be closed. When the actuator is brought within the specified switching distance (see page 1) the NO contact(s) will close and the NC contact will open.



Mounting

Do not use safety switches as a stop. 1 mm separation when closed provides the best results.

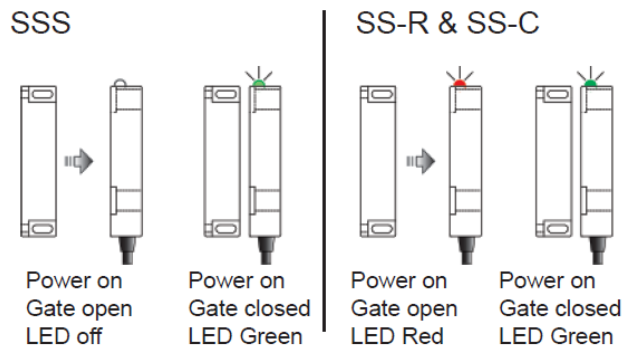
Minimum separation 50mm between adjacent switches DO NOT mount on hinged side of the guard.



LED Indication

SSS has a green LED which is illuminated when the switch is powered and the gate is closed.

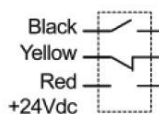
The SS-R and SS-C have a dual colour LED (Red & Green) Red when the power is on and gate open, green when the gate is closed.



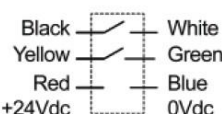
Connections and Fuses

PRE-WIRED

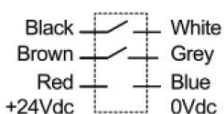
SSS-11 SS-C-11



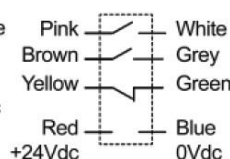
SS-C-20



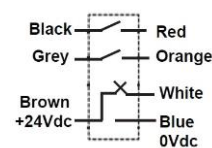
SSS-20



SS-R-21

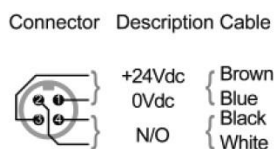


SS-R-21-FP



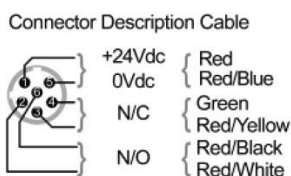
QUICK DISCONNECT

SS-C-10



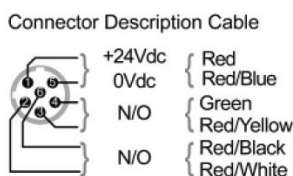
Connector
M12
4 Pole, Single Key way

SSS-11



Connector
Micro 1/2" UNF
6 pole, Dual Key Way

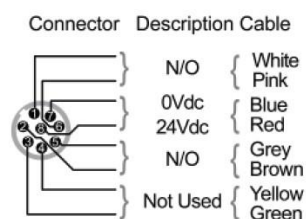
SSS-20



Connector
Micro 1/2" UNF
6 pole, Dual Key Way

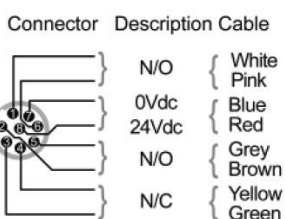
LEADED QUICK DISCONNECT

SS-C-20



Connector
150mm Lead, M12
8 Pole, Single Key way

SS-R-21



Connector
150mm Lead, M12
8 Pole, Single Key way

Contact Operation

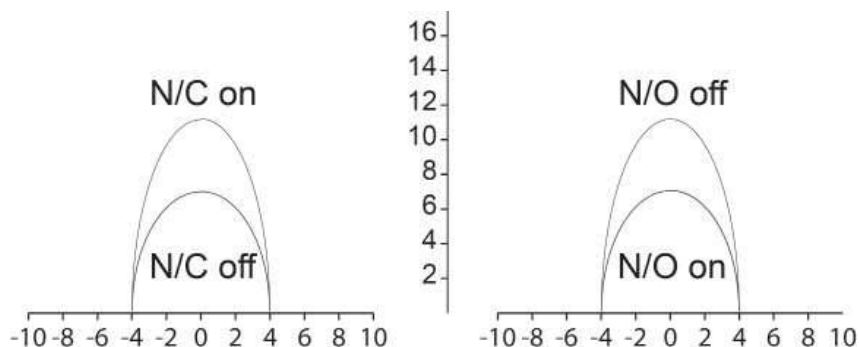
The N/O contacts on the Mechan switches are open when the actuator is away from the switch. When the actuator is within the specified operating distance the N/O contact will close and the N/C contact will open

Fuses

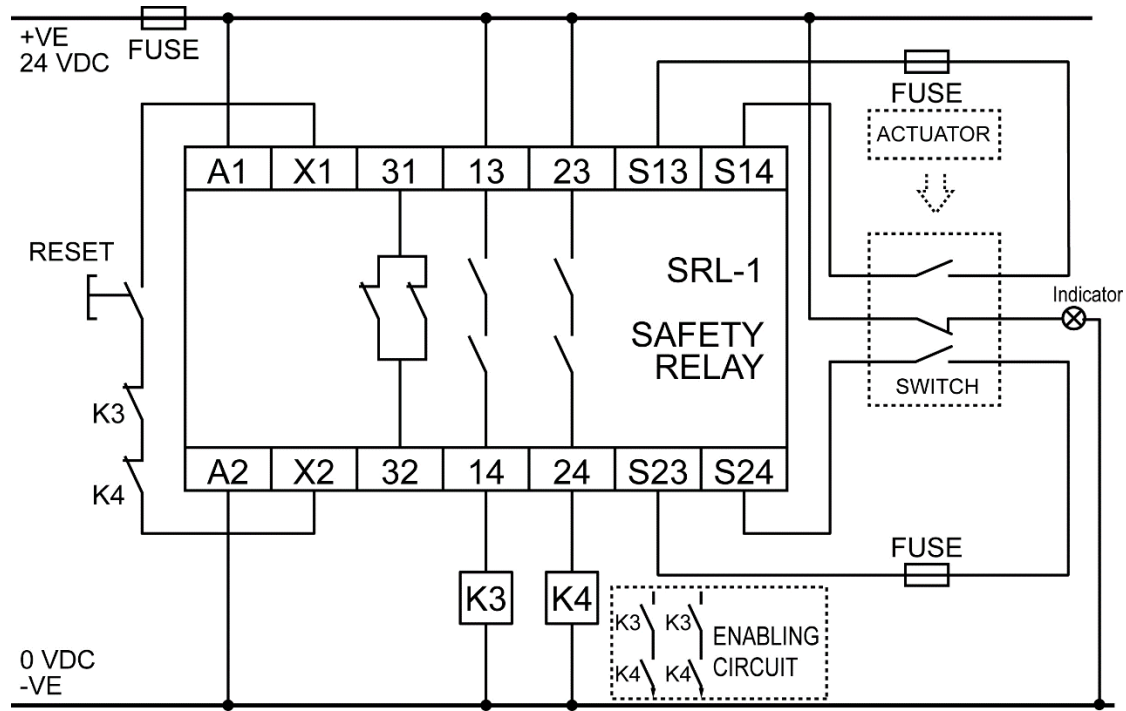
All safety contacts should be fused externally
SS-C CONTACTS = 0.3 Amps Fast Acting Fuse
SS-S CONTACTS = 3 Amps Fast Acting Fuse
SS-R CONTACTS = 3 Amps Fast Acting Fuse

Switching Characteristics

The chart shows the switching points in millimetres



Recommended Safety Control Unit



IMPORTANT

CONNECTION TO A SAFETY RELAY

The SS-C non-contact safety switch is designed to work with safety relays that have a low inrush current on the switch input. The SS-R and SSS safety switches are designed to work with any safety relay on the market.

All control contacts should be externally fused.

Recommended Safety Control Unit Mechan Part Number: SRL-1 24VAC/DC

Maintenance

It is recommended to check the safe operation of the switches and look for signs of damage or excessive wear on a weekly basis. Damaged units should be replaced or returned to the manufacturer for repair where practical.

Declaration of Conformity

Mechan Controls declares that the products shown conform to the Essential Health and Safety Requirements of the European Machinery Directive. The above products have been third party tested to conform to the requirements of EN-13849-1 and EN 62061. Full declaration of conformity can be downloaded from the Mechan Controls web site www.mechancontrols.co.uk or by contacting Mechan directly Tel: + 44 (0) 1695 722264

Notes

In the interest of product development specifications are subject to change without notice. It is the responsibility of the user to ensure compliance with any acts or by-laws in place. All information regarding Mechan equipment is believed to be accurate at the time of printing. Responsibility cannot be accepted for errors or omissions.



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