

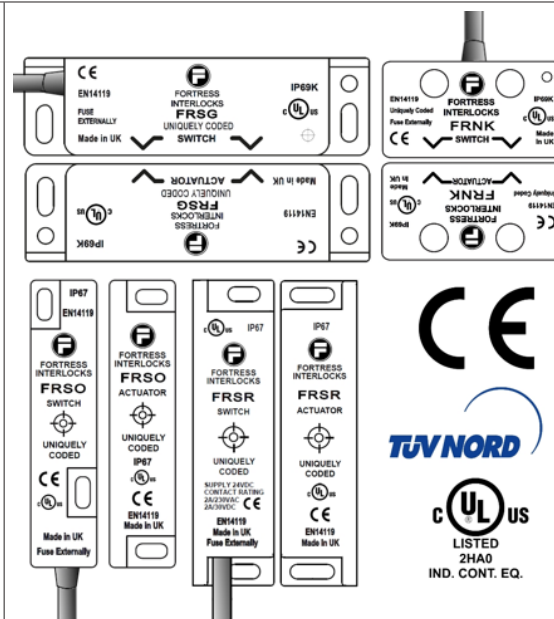
Operating Instructions for FRNK, FRSO, FRSG & FRSR Safety Switches

Description

The FR series safety switches applies radio frequency identification technology (RFID) in a variety of housings. Unlike other RFID switches on the market that use OSSD, Fortress have made the FR range standalone by adding volt free contacts. This means you are free to use most safety relays on the market, and not those specified to work with OSSD only.

The non-contact operation makes these safety switches easy to install and tolerant to misalignment. They are individually coded for high security applications providing a simple reliable solution to machine guard interlocking.

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



KEEP THIS GUIDE FOR FUTURE REFERENCE

The information is designed to help suitably qualified personnel install and operate Fortress Interlocks 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 Fortress Interlocks Ltd.

Technical Specifications	FRNK	FRSO	FRSG	FRSR
Contacts	2 NO + 1 NC	2 NO + 1 NC	2 NO + 1 NC	2 NO + 1 NC
Supply Voltage Options	24VDC (+/- 15%)	24VDC (+/- 15%)	24VDC (+/- 15%)	24VDC (+/- 15%)
Safety Contact Rating	24VDC / 500mA	24VDC / 500mA	24VDC / 3 Amps	24VDC / 3 Amps
Safety Contact Switching	10mm ON / 15mm OFF	10mm ON / 15mm OFF	10mm ON / 15mm OFF	10mm ON / 15mm OFF
Auxiliary Contact Rating	24VDC / 500mA	24VDC / 500mA	24VDC / 3 Amps	24VDC / 3 Amps
Auxiliary Contact Switching	10mm ON / 15mm OFF	10mm ON / 15mm OFF	10mm ON / 15mm OFF	10mm ON / 15mm OFF
External Fuse (customer supplied)	300mA Fast Acting	300mA Fast Acting	2.5 Amps Fast Acting	2.5 Amps Fast Acting
Construction	Orange ABS	Orange ABS	Orange ABS	Orange ABS
IP Rating	IP67/IP69K	IP67/IP69K	IP67/IP69K	IP67/IP69K
Operating Temperature	-10°C to +60°C	-10°C to +60°C	-10°C to +60°C	-10°C to +60°C
Fixing	4 X M4 Security Screws	4 X M4 Security Screws	4 X M4 Security Screws	4 X M4 Security Screws
Connection	Pre-Wired or M12 QD	Pre-Wired or M12 QD	Pre-Wired or M12 QD	Pre-Wired or M12 QD
Coding	Individually Coded	Individually Coded	Individually Coded	Individually Coded
Indication	Dual Colour LED	Dual Colour LED	Dual Colour LED	Dual Colour LED

Safety Related Data

B10d	2,000,000	PFH	6.52×10^{-8}
TM (Mission Time)	> 30 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)		

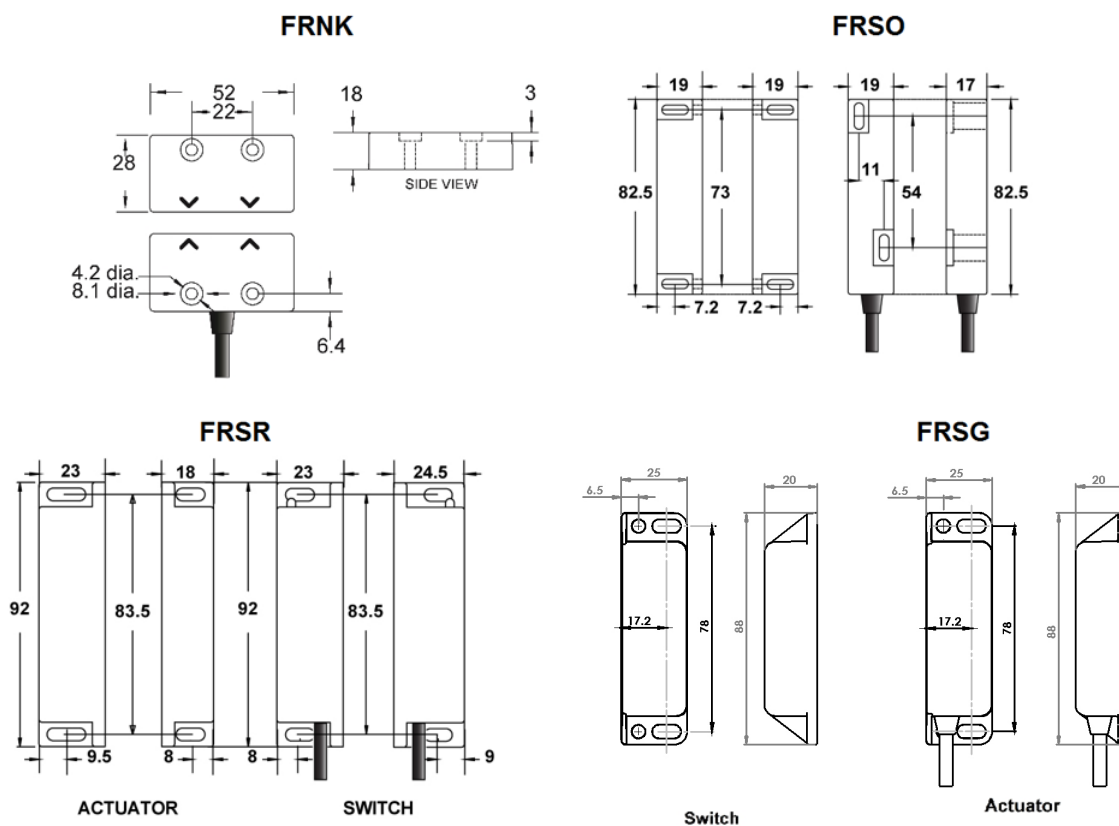
Note 1: Based on dual channel wiring according to CAT 4. Diagnostic coverage provided by downstream control logic. DC - medium, MTTFd = 100 Years. Suitable for performance level applications PLe according to ISO 13849-1. (SIL 3 or SIL 2 according to IEC 62061)

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Safety Standards

Approvals	CE Complies with all relevant sections of the CE Marking Directive
	cUL 508 Industrial Control, TUV Approved
International Directives	Machinery Directive 2006/42/EC, Low Voltage Directive 2014/35/EU; 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. Principles for design and selection.
	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



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Mounting

The FR range of 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.

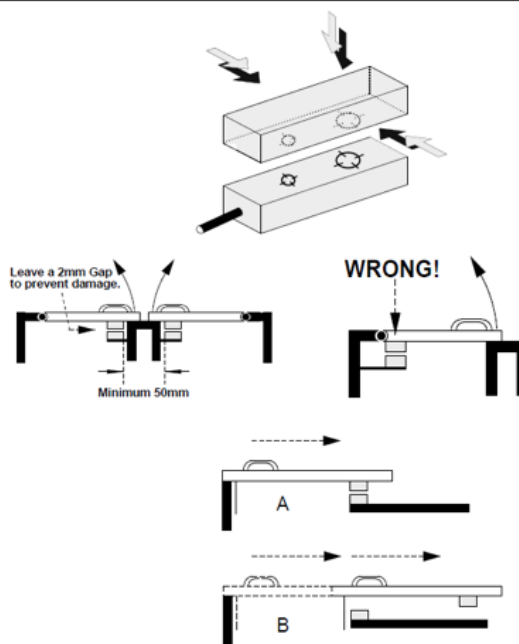
Mount the switch on to the machine frame and the actuator on to the opening edge of the door.

Use the tamper proof screws provided to make the installation more secure.

Do not use the safety switch as a door stop. Leave a minimum of 50 mm between any adjacent switches.

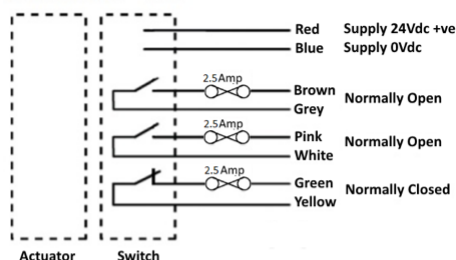
EN 14119

Provides some mounting suggestions, see example opposite.

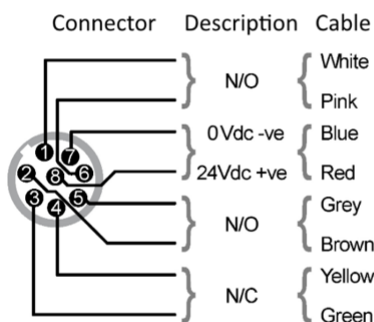
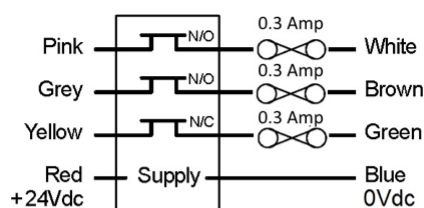


Connections & Fuses

FRSR & FRSG Contacts 2NO + 1NC



FRNK & FRSO Contacts 2NO + 1NC



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

***All FR safety switches are available with an M12 leaded quick disconnect**

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

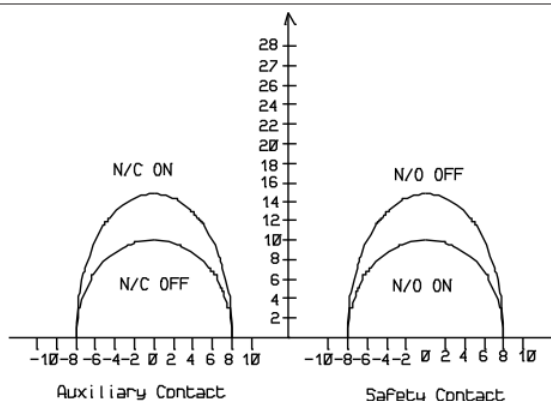


The FR series are available with an IP67, 6" (150mm), 8 pole 'pig tail' connector.
Connector specification: 8-pin, Micro Single Key-way, M12.

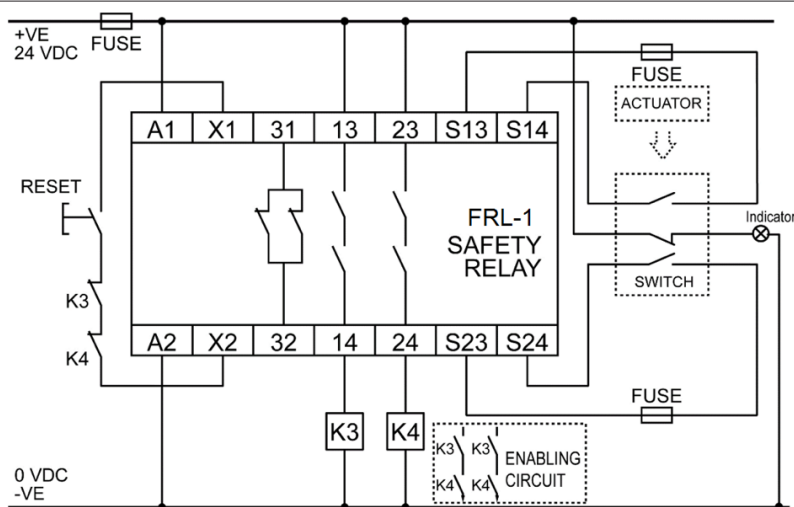
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Switching Characteristics

The chart shows the switching points in millimetres



Recommended Safety Control Unit



IMPORTANT

CONNECTION TO A SAFETY RELAY

The FRSR and FRSG non-contact safety switches are designed work with most safety relays on the market.

The FRNK and FRSO are designed to be connected to a safety control circuit which has less than 0.5 Amps inrush current.

All control contacts should be externally fused.

Recommended Safety Control Unit Fortress Part Number: FRL-1 24VAC/DC or FEM1 & FMX1

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.

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 Fortress equipment is believed to be accurate at the time of printing. Responsibility cannot be accepted for errors or omissions.