

## Non contact Switches

### Ferrocode



#### Description

A two-channel system, the Ferrocode setup consists of an actuator and a separate safety switch head that is connected to a monitoring control unit. The Ferrocode uses electromagnetic coding, which provides a higher level of security over magnetic coding systems. To further prevent possible override of the system, both sensor and actuator are supplied with tamper-resistant mounting hardware.

The absence of moving parts and direct physical contact between sensor and actuator eliminate mechanical wear.

A Ferrocode sensor may be used without the control unit for low power/low risk applications. However, risks should be thoroughly evaluated prior to application of this method.

The control unit should be used when monitoring and checking of the circuit is required. Up to 6 Ferrocode switches can be interfaced with the 110/230V control unit and up to 15 Ferrocode switches with the 24V version. A control unit may also be used in conjunction with electromechanical safety devices such as limit switches, gate interlocks and emergency stops with two contacts, 1 N.O. & 1 N.C.

#### Features

- Electro-magnetic tamper resistant coding
- Interfaces directly to a safety relay control unit

#### Specifications

Standards	EN954-1, ISO13849-1, IEC/EN60204-1, NFPA79, EN1088, ISO14119, IEC60947-5-1, ANSI B11.19, AS4024.1
Category	Cat. 3 per EN954-1 (Sensors with controller)
Approvals	CE marked for all applicable directives and cULus
Power Supply	24V AC/DC or 110/230V AC
Power Consumption	<6VA
X1-X2 Contactor Monitor Loop	Normally closed contactor loop
Safety Inputs	1 N.O. & 1 N.C. from Ferrocode head
Internal Fuse	500 mA T replaceable supply fuse
Internal Switches	Mains selector switch
Relay Output	2 N.O. & 1 N.C. TÜV approved

#### Specifications (continued)

Utilization Category (AC)	4A/250V AC/1000VA at COSφ=1
Max Switched DC Current/Volt	2A/30V DC/60W
Min Switched DC Current/Volt	10mA/10V
Max Output Fuse	5A quick acting
Indication	Green = Power ON Green = Output closed
Max Drop Out Time	<50mS
Impulse withstand Voltage	2500V
Operating Temperature	-10°C to +55°C (14°F to 131°F)
Contamination Level	3
Humidity	90% RH
Degree of Enclosure Protection	IP40 DIN 0470
Terminal Isolation	IP20 DIN 0470
Max Conductor Size	1 x 2.5mm <sup>2</sup> (14 AWG) stranded with sleeve stripped 8mm, 1 x 4mm <sup>2</sup> (14AWG) solid conductor
Terminals	Plus-minus terminal screws M3.5 Box terminal with wire protection
Weight 24V DC unit 110/230V unit	314g (0.69lbs) 530g (1.17lbs)
Material & Colour	Red polycarbonate
Housing	16 way D = 120 H = 73 W = 45.5
Installation Group	C in accordance with VDE 0110
Fixing Details	35mm DIN rail

#### Switching Head

Power Supply	24V DC +/- 15%
Power Consumption	<1VA
Internal Fuse	1A output fuse
Safety Distance	ON = 7mm, OFF = 9mm
Aux. Distance	ON = 9mm, OFF = 14mm
Outputs	1 N.O. & 1 N.C.
Utilization Category (AC)	0.5A/120V AC/60VA at COSφ =1
Max Switched DC Current/Volt	1A/28V DC/28W
Min Switched DC Current/Volt	10mA/10V
Max Output Fuse	1A quick acting
Indication	LED 1 Green 1 = Guard closed
Impulse withstand Voltage	2500V
Operating Temperature	-10°C to +55°C (14°F to 131°F)
Contamination Level	3
Humidity	90% RH
Degree of Protection	IP67 (NEMA 6P)
Weight (not including cable)	Switch 30g (0.07lbs) Actuator 40g (0.09lbs)
Material & Colour	Red moulded ABS plastic
Fixing Details	M4
Cable	0.2 mm <sup>2</sup> (24AWG) 6 wire: Braided PVC jacket OD 6mm (0.23in)

**Product Selection**

Type	Supply Voltage	Safety Contacts	Auxiliary Contacts	Connection	Housing	Catalogue Number
Control Unit	24V AC/DC	2 N.O.	1 N.C.	Terminals	45mm Wide Polycarbonate	440N-C02068
	110V 230V AC					440N-C02070
Switch & Actuator	24V AC/DC	1 N.C. & 1 N.O.	None	2m Cable	Red, ABS Plastic	440N-C02067
				6m Cable		440N-C02078
				8m Cable		440N-C02076
				10m Cable		440N-C02079

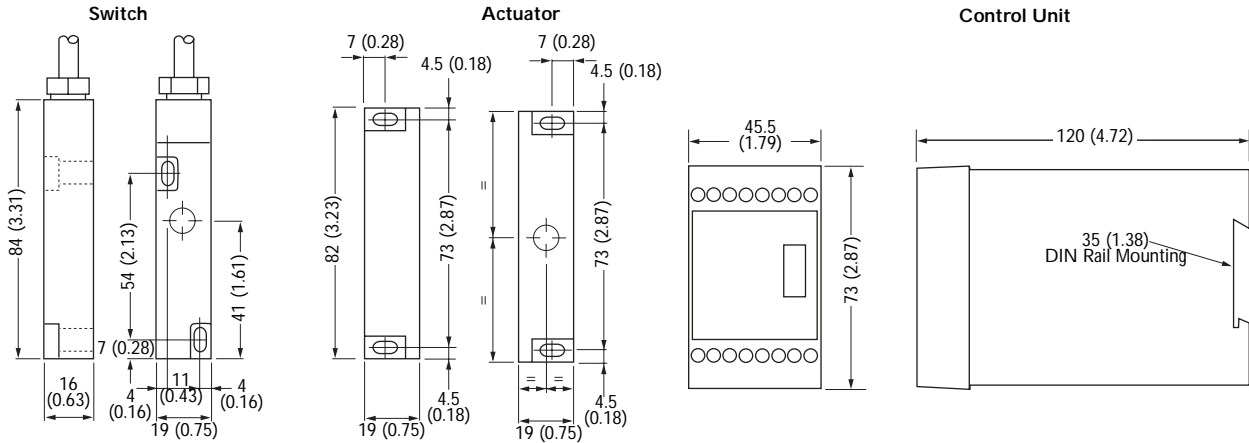
**Note:** Contacts are described with the guard door close, that is, actuator in place. Switch is shipped complete with actuator.

**Accessories**

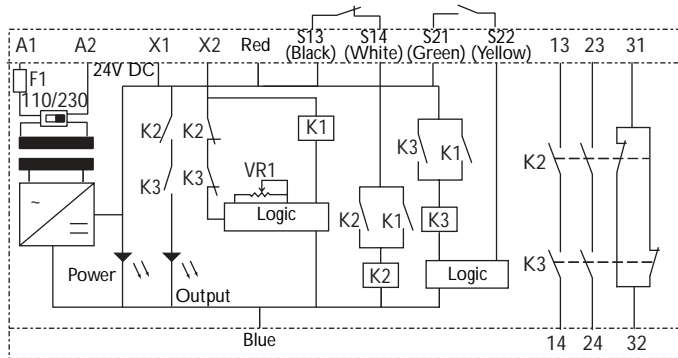
Description	Page Number	Catalogue Number
Actuator	—	440N-A02071
Fuse, 500mA	14-6	440R-A31562

**Approximate Dimensions—mm (inches)**

*Dimensions are not intended to be used for installation purposes.*



**Block**

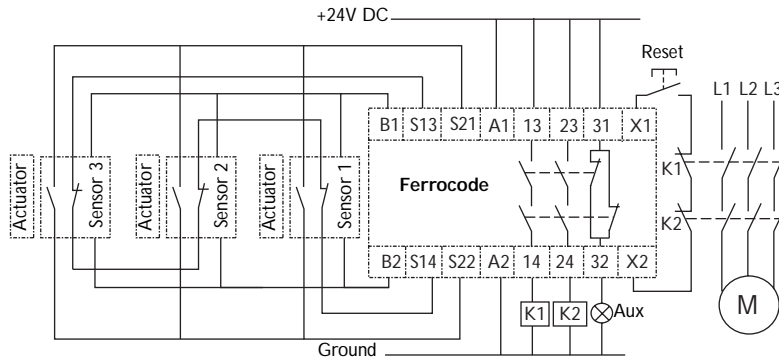


Interlock Switches

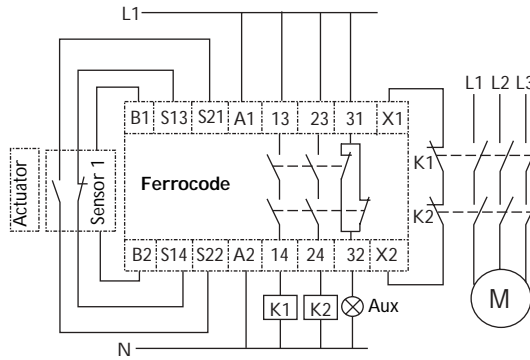
**Non contact Switches**

**Ferrocode**

Typical Wiring Diagrams

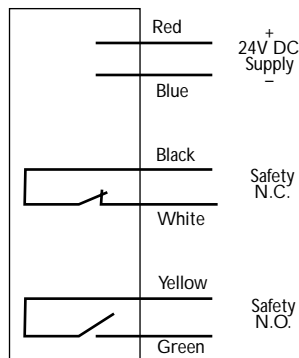


*Multiple Sensor Input, Manual Reset, Dual-Channel Output, Monitored Output*



*Single Sensor Input, Automatic Reset, Dual-Channel Output, Monitored Output*

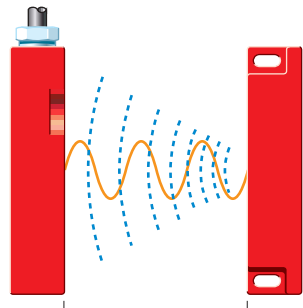
Ferrocode Sensor



**Note:** External Fuse is recommended when switch is not powered by a Ferrocode control unit. Recommend using 24V DC or 110V AC, 300mA fuse.

**Typical Application Details**

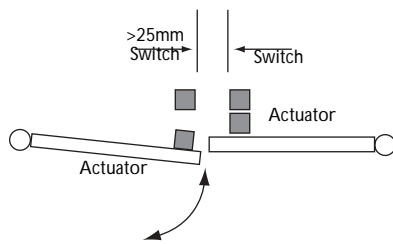
On presenting the actuator to the switch, the high-intensity electromagnetic field together with a resonant frequency signal causes the contacts to close. On removing the actuator (opening the door) the safety contacts open, isolating the machine. The switch can not be overridden by magnets, tools, etc.



Safety contact operating distance:  
make 7mm, break 9mm  
 Auxiliary contact operating distance:  
make 9mm, break 14mm

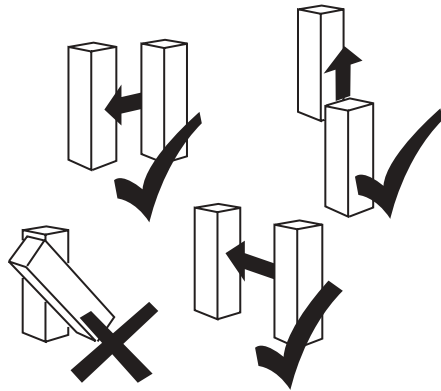
**Application Details**

**Actuator Spacing**



On hinged doors, install switch at the opening edge. Where 2 switches are mounted adjacent, they should be no closer than 25mm. Recommend a 2mm spacing between switch and actuator.

**Actuator Approach Directions**

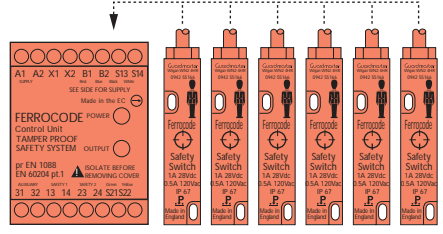


**Typical Configurations**

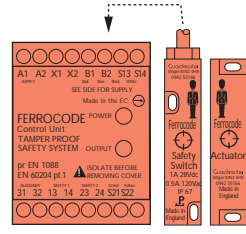
The Ferrocode switch can be used without a control unit for low risk/low power applications.



Six Ferrocode switches can be used with one control unit for high risk applications. Connect the N.C. contacts (black and white wires) in series and the N.O. contacts (green and yellow wires) in parallel.



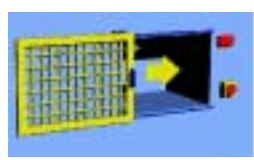
One Ferrocode switch used with a control unit provides a higher integrity system.



**Typical Applications**

**Note:** Removable guards using Non contact switches may require two switches, one at either side of the guard, or the use of a flap to prevent initial lifting of the non-interlocked edge.

**Sliding Guard**



**Removable Guard**



**Hinged Guard**

