

# Safety Switches

## Non-Contact Switches

### Sipha™ Sensors



#### Description

With the increasing speed and complexity of applications a simple magnetic switch may be insufficient to meet the increased risks, therefore Sipha's design incorporates several magnetically sensitive elements which must be triggered in a particular sequence to operate correctly. The Sipha sensor, designed to operate with its own actuator, helps prevent defeatability by a simple magnet.

The Sipha with its molded-in brackets and diminutive size, is extremely versatile and simple to install. The Sipha sensor must be connected to the Sipha control unit giving a monitored circuit. For high-risk applications the control unit is used with a single sensor to give a high-integrity system. For other applications, multiple sensors (including mechanical switches) can be connected to one Sipha control unit. Sipha has facilities for connecting a manual reset button and for monitoring external devices such as contactors.

Four types of sensors and actuators are available incorporating different operating distances and physical sizes.





#### Features

- Non-contact actuation
- Magnetic coded sensing
- Four housing styles
- Must be operated with its own safety control unit

#### Specifications

| Safety Ratings   |  |
|--|--|
| Standards  | EN954-1, ISO13849-1, IEC/EN60204-1, NFPA79, EN1088, ISO14119, IEC60947-5-1, IEC/EN60947-5-3, ANSI B11.19, AS4024.1   |
| Safety Classification  | Rating dependent on control unit and application.  |
| Functional Safety Data   | B10d: > 2 x 10 <sup>6</sup> operations at min.<br>PFH <sub>D</sub> : > 3 x 10 <sup>-7</sup><br>MTTFd: > 385 years  |
| <b>Note:</b> For up-to-date information, visit <a href="http://www.ab.com/Safety/">http://www.ab.com/Safety/</a> | Dual channel interlock may be suitable for performance levels PLe or PLD (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on application characteristics |
| Certifications   | CE Marked for all applicable directives, cULus, and TÜV  |
| Outputs (Guard Door Closed, Actuator in Place)   |  |
| Auxiliary Output Switching   | 300V DC, 250V AC, 0.5 A including inrush. 15V A/10 W suitable for AC/DC circuits   |
| Operating Characteristics  |  |
| Sensing Distance, Make [mm (in.)]  | Style S1: 5 (0.20)<br>Style S2: 9 (0.35)<br>Style S3: 5 (0.20)<br>Style S4: 10 (0.39)  |
| Sensing Distance, Break [mm (in.)]   | Style S1: 11 (0.43)<br>Style S2: 12 (0.47)<br>Style S3: 12 (0.47)<br>Style S4: 13 (0.51)   |
| Environmental  |  |
| Enclosure Type Rating  | IP67 (NEMA 6P)   |
| Operating Temperature [C (F)]  | S1, S2, S3: -10...+55° (+14...+131°)<br>S4 (GD2): -25...+125° (-13...+257°)  |
| Vibration  | 1 mm, 10...55 Hz   |
| Shock  | 30 g, 11 ms half-sine  |
| Physical Characteristics   |  |
| Cable Size   | 0.54 mm <sup>2</sup> (20 AWG) 4-wire PVC Jacket OD—4 mm (0.16 in.)   |
| Material   | S1, S2: Molded ABS<br>S30 (Actuator): Polyester<br>S31 (Sensor): Nylon (Trogamid)<br>S4 (GD2): Stainless Steel   |
| Mounting   | Any position   |
| Weight [g (lbs)]   | S1: Sensor: 18 (0.04); Actuator: 15 (0.03)<br>S2: Sensor: 20 (0.04); Actuator: 30 (0.07)<br>S3: Sensor: 18 (0.04) Actuator: 6 (0.01)<br>S4: Sensor: 150 (0.33); Actuator: 170 (0.37)                           |

**Product Selection**

| Housing Style   | Housing Material                                   | Safety Contacts | Auxiliary Contacts | Type            | Connection | Cat. No.           |                   |                    |
|---|--|-----------------|--------------------|-----------------|------------|--------------------|-------------------|--------------------|
| <br>S1 | ABS plastic  | 1 N.C. & 1 N.O. | None               | S11             | 3 m Cable  | <b>440N-S32014</b> |                   |                    |
|   |  |                 |                    |                 | 10 m Cable | 440N-S32016        |                   |                    |
|   |  |                 | 1 N.C.             | S12             | 3 m Cable  | 440N-S32022        |                   |                    |
|   |  |                 |                    |                 | 10 m Cable | 440N-S32032        |                   |                    |
|   |  |                 | 1 N.O.             | S13             | 3 m Cable  | 440N-S32037        |                   |                    |
|   |  |                 |                    |                 | 10 m Cable | 440N-S32036        |                   |                    |
| <br>S2 | ABS plastic  |                 | 1 N.C. & 1 N.O.    | None            | S21        | 3 m Cable          | 440N-S32015       |                    |
|   |  |                 |                    |                 |            | 10 m Cable         | 440N-S32017       |                    |
|   |  |                 |                    | 1 N.C.          | S22        | 3 m Cable          | 440N-S32023       |                    |
|   |  |                 |                    |                 |            | 10 m Cable         | 440N-S32033       |                    |
|   |  |                 |                    | 1 N.O.          | S23        | 3 m Cable          | 440N-S32038       |                    |
|   |  |                 |                    |                 |            | 10 m Cable         | 440N-S32039       |                    |
| <br>S3 | Actuator: Polyester<br>Sensor: Nylon<br>[Trogamid] | 1 N.C. & 1 N.O. |                    | None            | S31        | 3 m Cable          | 440N-S32101       |                    |
|   |  |                 |                    |                 |            | 4-Pin Micro (M12)  | 440N-S32024       |                    |
| <br>S4 | Stainless Steel                                    |                 |                    | 1 N.C. & 1 N.O. | 1 N.C.     | S42                | 8-Pin Micro (M12) | <b>440N-S32047</b> |
|   |  |                 |                    |                 |            |                    | 3 m Cable         | 440N-S32055        |
|   |  |                 |                    |                 |            |                    | 10 m Cable        | 440N-S32056        |
|   |  |                 |                    |                 | 1 N.O.     | S43                | 8-Pin Micro (M12) | 440N-S32046        |
|   |  |                 | 3 m Cable          |                 |            |                    | 440N-S32053       |                    |
|   |  |                 | 10 m Cable         |                 |            |                    | 440N-S32054       |                    |

**Recommended Logic Interfaces**

| Housing   | Supply Voltage            | Safety Contacts            | Auxiliary Contacts | Housing Width | Type           | Cat. Page No. | Cat. No.    |
|---|---------------------------|----------------------------|--------------------|---------------|----------------|---------------|-------------|
|  | 24V AC/DC                 | 1 N.O.                     | 1 N.C. Solid State | 22.5 mm       | Control Unit 1 | 5-74          | 440N-S32013 |
|  | 24V AC/DC;<br>115/230V AC | 2 N.O.                     | 1 N.C.             | 45 mm         | Control Unit 2 |               | 440N-S32021 |
|  | 24V AC/DC;<br>115/230V AC | 2 N.O. + 1 N.O.<br>delayed | 1 N.C.             | 90 mm         | Sipa 6         |               | 440N-S32052 |

**Connection Systems**

| Description | 4-Pin Micro (M12) | 8-Pin Micro (M12) |
|-------------|-------------------|-------------------|
| Cordset     | 889D-F4ECA-*      | 889D-F8AB-*       |
| Patchcord   | 889D-F4ECRM-*     | 889D-F8ABDM-*     |

\* Replace symbol with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.  
 \* Replace symbol with 1 (1 m), 2 (2 m), 3 (3 m), 5 (5 m), or 10 (10 m) for standard cable lengths.  
**Note:** For additional information, see page 7-1.

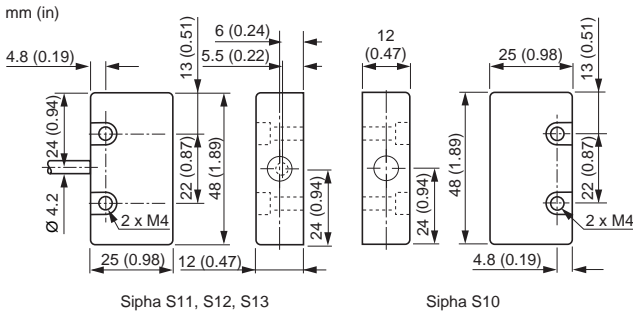
**3-Interlock  
Switches**

Safety Switches  
**Non-Contact Switches**  
 Sipa™ Sensors

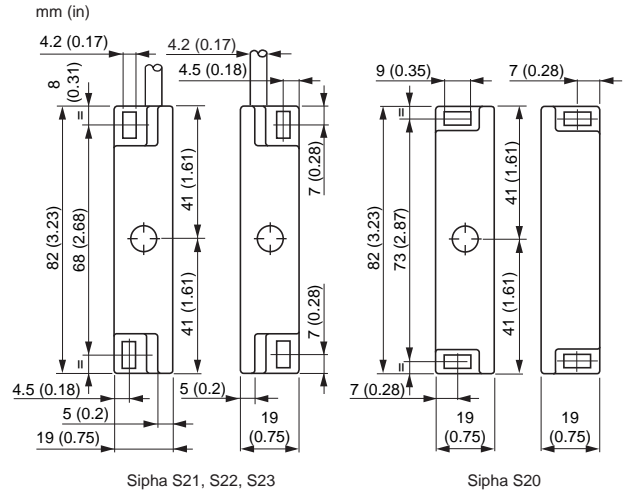
**Approximate Dimensions**

Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.

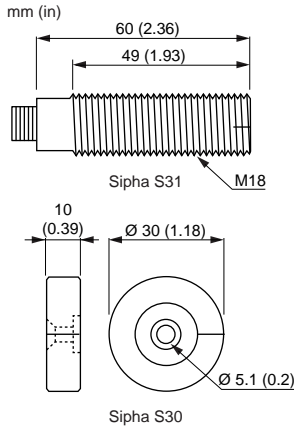
**Sipa S1**



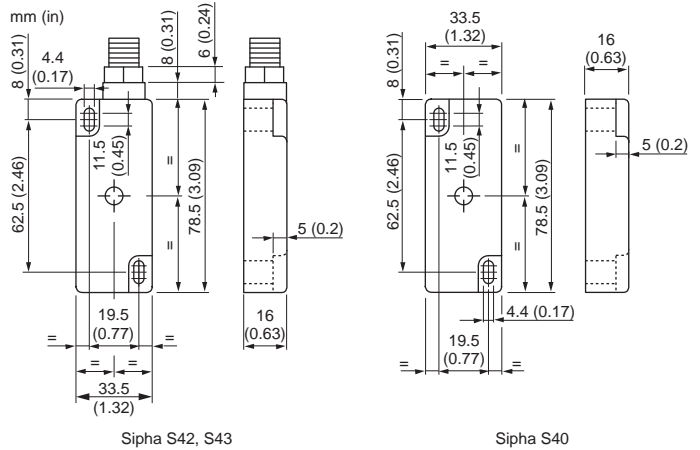
**Sipa S2**



**Sipa S3**



**Sipa S4**



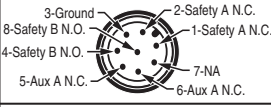
**Accessories**

| Description                     | Cat. No.    |
|---------------------------------|-------------|
| Actuator S10                    | 440N-A32019 |
| Actuator S20                    | 440N-A32020 |
| Actuator S30                    | 440N-A32025 |
| Actuator S40 (GD2)              | 440N-A32041 |
| Bag of 40 washers for S2 models | 440N-A17127 |

**Typical Wiring Diagrams**

| Description    |        | S11, S21        | S42, S12, S22   | S43, S13, S23   |
|----------------|--------|-----------------|-----------------|-----------------|
|                |        | 1 N.O. + 1 N.C. | 2 N.C. + 1 N.O. | 1 N.C. + 2 N.O. |
| Cable Versions | Red    | Safety A_N.C.   | Safety A_N.C.   | Safety A_N.C.   |
|                | Blue   |                 |                 |                 |
|                | Yellow | Safety B_N.O.   | Safety B_N.O.   | Safety B_N.O.   |
|                | Green  |                 |                 |                 |
|                | Black  | —               | Aux A_N.C.      | Aux A_N.O.      |
|                | White  | —               | External Ground | External Ground |
| Green/Yellow   | —      | External Ground | External Ground |                 |

| Description                 |                | S31   | S42  | S43   |
|-----------------------------|----------------|---|--|---|
| 4-Pin Micro (M12)           |                |  | —  | —   |
| 8-Pin Micro (M12)           |                | —   |  |  |
| 4-Pin Cordset<br>889D-F4AC* | Brown          | Safety A_N.C.   | —  | —   |
|                             | Blue           |   |  |   |
|                             | White          | Safety B_N.O.   | —  | —   |
|                             | Black          |   |  |   |
| 8-Pin Cordset<br>889D-F8AB* | White<br>Brown | Safety A  | Safety A_N.C.  | Safety A_N.C.   |
|                             | Red<br>Yellow  | Safety B  | Safety B_N.O.  | Safety B_N.O.   |
|                             | Grey<br>Pink   | Aux A   | Aux A_N.C.   | Aux A_N.O.  |
|                             | Green<br>Blue  | NA  | Gnd  | Gnd   |

\* Replace symbol with 2 (2 m), 5 (5 m) or 10 (10 m) for standard cable lengths.