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# SERIES BNS33

## Coded-Magnet Sensors




## Description

The Series BNS33 coded-magnet sensors are designed for use as a safety interlock switch on movable machine guards/articulating robot arms. Each sensor set consists of a multiple reed switch unit and a coded-magnet actuator. The reed switches, wired in series, will only close in the presence of their matched magnetic field array.

Both switch and magnet assemblies are sealed to IP67 (submersible) standards. Their tamper-resistant design prevents bypassing with a simple magnet or improperly coded magnetic field. In addition, the BNS module features an optional built-in LED display of switch status, and a 1-meter long prewired pigtail to assure sealing integrity.

## Operation

The reed switch assembly is typically mounted to a stationary portion of a guard structure, with the coded-magnet assembly mounted to the movable element of the machine guard. When the guard is closed, and the matched magnetic field aligns with the reed switch unit, the switches will close. When the guard is open, or the required magnetic-field array is not properly aligned with the reed switch assembly, the sensor output will remain “off.”

## Typical Applications

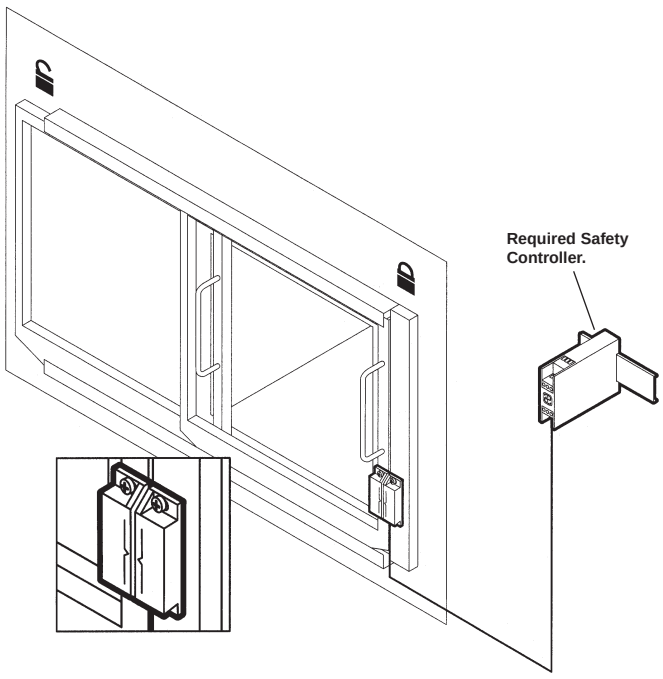
The sealed, compact BNS33 is ideal for use on movable machine guards in hostile environments or where space is limited. Typical applications include food processing equipment, chemical processing equipment, woodworking machinery, packaging machinery, and articulating robot arm rest position sensing.

***Important Note:** Series BNS coded-magnet sensors are for use in safety applications only when used with a SCHMERSAL Series AES safety controller. (Please see selection chart on Page 130.)

**USE WITH ANY OTHER SAFETY CONTROLLER MAY DAMAGE SENSOR AND/OR VOID WARRANTY.**

## Features & Benefits

- **Compact size** … ideal for limited space applications.
- **Sealed for submersibility** … assures long-term reliability in the most hostile environments.
- **Tamper-resistant** … cannot be bypassed with simple magnets.
- **Rugged, corrosion-resistant housing** … tolerates most industrial environments.
- **Integral LED status indicators** … facilitate easy installations and provide visual indication of switch status.
- **Shock and vibration tolerant** … designed to withstand mechanical abuse.
- **Satisfy EN954, Category 1, 3, or 4** … when used with appropriate Series AES safety controllers.
- **Optional high-strength field coded-magnets** … extends sensing range to 10mm.
- **Units available with M8 quick-connect.** (Please consult factory).






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# BNS33 AVAILABLE MODELS AND ACCESSORIES

## AVAILABLE STANDARD MODELS

**(Please order BPS33 or BPS33-2326 magnet separately)**

| Part Number | Contact Configuration* | Maximum Contact Rating | Description |
|---|---|---|---|
| BNS33-11z** | 1 NO & 1 NC | 100VAC/DC (400mA) | Multiple reed switch assembly with 1-meter prewired pigtail |
| BNS33-12z*** | 1 NO & 2 NC | | |
| BNS33-11zG** | 1 NO & 1 NC | 24VDC (10mA) | Multiple reed switch assembly with 1-meter prewired pigtail and built-in LED display |
| BNS33-12zG*** | 1 NO & 2 NC | | |
| BNS33-11z-2063 | 1 NO & 1 NC | 120VAC/DC (500mA) | Multiple reed switch assembly with 1-meter prewired pigtail |
| BNS33-12z-2187** | 1 NO & 2 NC | 120VAC/DC (250mA) | |
| BPS33 | N/A | N/A | Coded-magnet actuator (5mm sensing distance) |
| BPS33-2326 | N/A | N/A | Coded-magnet actuator (10mm sensing distance) |
| BNS33-11z-ST** | 1NO & 1NC | 60VAC/DC (400mA) | Multiple reed switch assembly with M8x1 quick-connect |
| BNS33-11zG-ST** | 1NO & 1NC | 24VDC (10mA) | |
| BNS33-12z-ST*** | 1NO & 2NC | 60VAC/DC (400mA) | |
| BNS33-12zG-ST*** | 1NO & 2NC | 24VDC (10mA) | |

*Contact configuration in presence of BPS33 coded-magnet actuator.

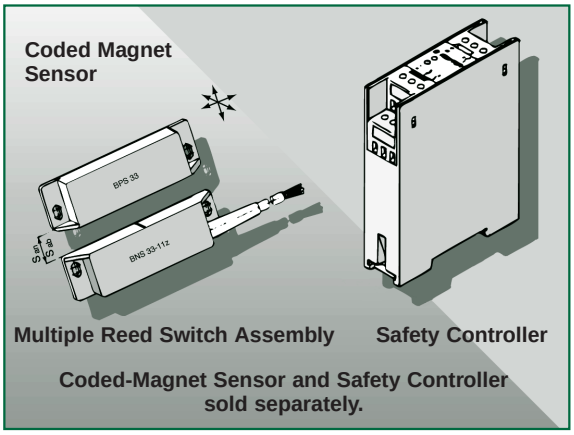
**These models feature isolated contacts.

***These models feature C-form contacts.

Note: Longer prewired cables (3M, 5M, or 10M lengths) available on request. Please consult factory.

## AVAILABLE ACCESSORIES

| Part Number | Description |
|---|---|
| BN31/33 | Shim plate for mounting reed switch assembly on ferrous material |
| M8ST-2M | Straight quick-connect with 2M cable |
| M8ST-5M | Straight quick-connect with 5M cable |
| M8ST-10M | Straight quick-connect with 10M cable |
| M8ST-15M | Straight quick-connect with 15M cable |
| M8ST-RA-2M | Right-angle quick-connect with 2M cable |
| M8ST-RA-5M | Right-angle quick-connect with 5M cable |
| BNS-SS-CVR | Stainless-steel protective cover for BNS33-xxx |
| BPS-SS-CVR | Stainless-steel protective cover for BPS33-xxx |




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# BNS33 TECHNICAL DATA

## MECHANICAL SPECIFICATIONS

| | |
|---|---|
| **Housing** | Fiberglass reinforced thermoplastic |
| **Switching Distance "S"*** | "On": 5mm (0.2")<br>"Off": 15mm (0.6") |
| **Degree of Protection** | IP67 |
| **Operating Temperature** | –13°F to +158°F |
| **Operating Principle** | Magnetic |
| **Shock Resistance** | 30g/11ms |
| **Vibration Resistance** | 10 to 55 Hz, amplitude 1mm |
| **Conformity to Standards** | CE, UL, CSA<br>VDE 0470 Part 1<br>IEC 529/EN60529 |

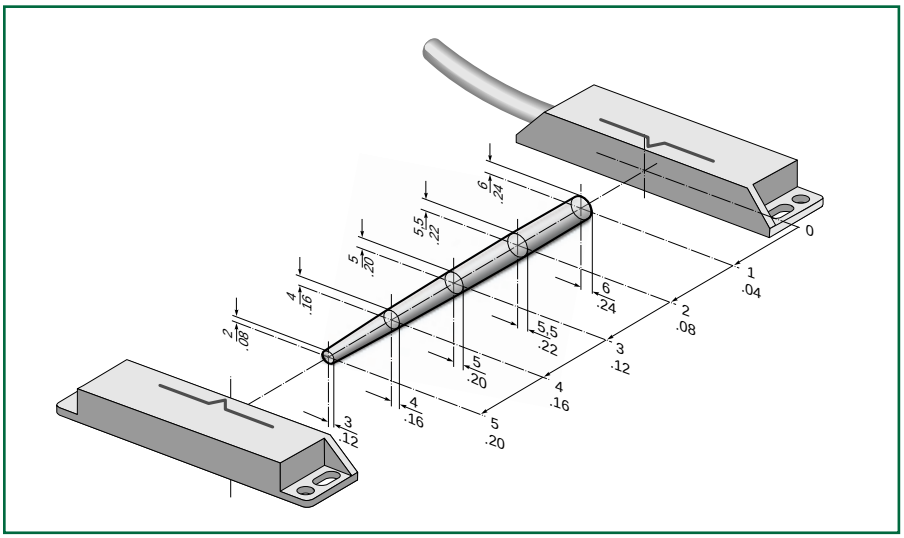
*Without ferromagnetic material in vicinity of switch or magnet. The proximity of ferrous material may affect switching distances.

## ELECTRICAL SPECIFICATIONS

| | |
|---|---|
| **Maximum Contact Rating** | 100VAC/DC (BNS33-11z/12z)<br>24VDC (BNS33-11zG/12zG)<br>120VAC/DC<br>(BNS33-11z-2063)<br>120VAC/DC (BNS33-02z/12z-2187) |
| **Maximum Continuous Current Rating** | 0.4A (BNS33-11z/12z)<br>10mA (BNS33-11zG/12zG)<br>0.5A<br>(BNS33-11z/10z/01z-2063)<br>250mA (BNS33-02z/12z-2187) |
| **Maximum Switching Capacity (Power Rating)** | 10VA (BNS33-11z/12z)<br>240mA (BNS33-11zG/12zG)<br>10VA<br>(BNS33-11z/10z/01z-2063)<br>240mW (BNS33-02z/12z-2187) |
| **Type Connection*** | 1 meter long LiYY4* 0.25mm$^2$ (23AWG) pre-wired pigtail.<br>M8x1 quick-connect for versions with "ST" suffix |

*Longer prewired cables available on request. Please consult factory.

## BPS33 MISALIGNMENT ALLOWANCE





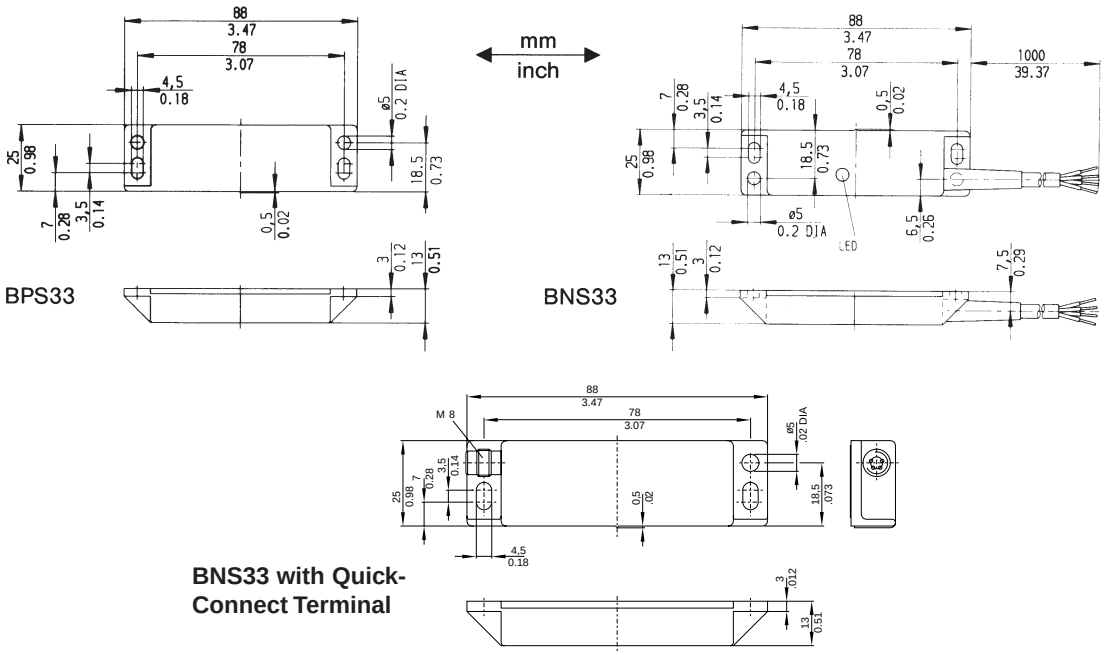




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# BNS33 TECHNICAL DATA

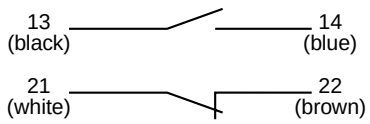
## DIMENSIONS



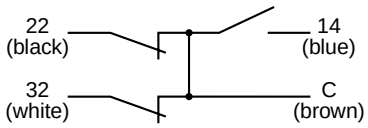

**Note: BNS33 reed switch assemblies should be mounted at least 50mm (2") apart.**

## WIRING DETAILS

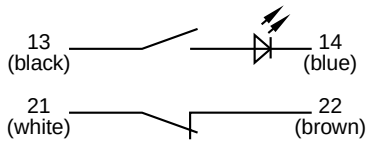
### BNS33-11z



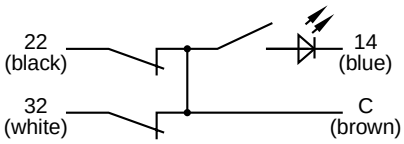

### BNS33-12z



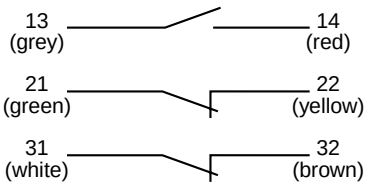

### BNS33-11zG



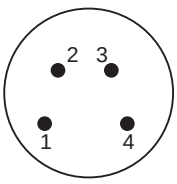

### BNS33-12zG




### BNS33-12z-2187

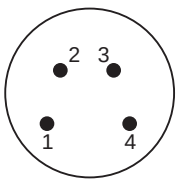



### Quick-Connect for BNS33-11 units




Pins 1-2 are Normally-closed
Pins 3-4 are Normally-open

### Quick-Connect for BNS33-12 units




Pin 1: Common
Pins 2 & 4 are Normally-closed
Pin 3 is Normally-open





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