# Isolating Barrier
# for our A5S1… sensors in hazardous areas
# Series D461R1


D461R1 Front View

## KEY FEATURES

- ATEX, UKEX, IECEx, KCs certified
- Approved according to UL and CSA standards
- Protection grade Ex ia IIC
- Establishes a highly efficient system to detect speed (and direction) in a hazardous area, in conjunction with one of our sensors series A5S1…
- Provides intrinsic safety for the sensor and its cabling
- Comprehends sensor supply and signal connection
- Sensor supply monitoring
- Free-floating, therefore maximum immunity versus EMI
- Push/pull signal output to subsequent monitors

## BENEFITS

- Maintenance-free during lifetime, therefore minimized TCO
- No EMI influence compared to zener barriers
- No signal degradation compared to zener barriers
- Powerful signal output to signal evaluation

## Safety first – for intrinsically safe (Ex ia) implementations

The BRAUN Isolating Barrier units D461R1 are ATEX, UKEX, IECEx, KCs certified to meet the particular requirements of explosion protection areas (Zone 0 or 1). In addition, they are approved according to UL and CSA standards.

The Isolating Barrier establishes a highly efficient system to detect speed and/or direction in a hazardous area, in conjunction with one of our sensors series A5S1…, to supply high-level output signals to the periphery.

The barrier provides an intrinsic safety circuit for the sensor and its cabling and does not require Ex d measures.

The signal input is isolated from the signal output. Both are isolated versus the power supply. The signal output of the unit repeats the input pulse signals with push/pull characteristics.

The signal input matches the specifications of the speed sensor series A5S1…, which are approved as intrinsic safety devices to be installed in hazardous area Zone 0 or 1.

The sensor supply circuit is monitored, and a fault is signalized.

The barrier unit D461R1 must be installed in a safe (non-hazardous) area or within an explosion-proof (Ex d) enclosure.

# Specifications of D461R1

**Conformity to Standards**

| EU-Directive(s) | Standard(s) |
|---|---|
| 2014/30/EU (EMC Directive) | EN 61326-1, EN IEC 61326-3-2 |
| 2014/35/EU (Low Voltage Directive) | EN 61010-1 |
| 2011/65/EU (RoHS Directive) | EN IEC 63000 |
| 2014/34/EU (ATEX Product Directive) | EN IEC 60079-0, EN 60079-11 |

UKEX Standards: BS EN IEC 60079-0, BS EN 60079-11
US Standards: National Electrical Code (NEC) dated 2014
UL 60079-0, UL 60079-11, UL 61010-1, edition 3
Canadian Standards: Canadian Electrical Code (CEC) dated 2012
CSA C22.2 Nos. 60079-0, 60079-11, 61010-1

**System Configuration**

The barrier D461R1 must be installed in the safe (non-hazardous) area, whereas the sensor A5S1 may be placed wherever it is required within the hazardous area, connected via a standard (screened) cable.
The D461R1 output may be transmitted without restriction to any signal evaluating unit.

**Sensor Input**

Response level (low < 1.8 V, high > 3.5 V
Input impedance 47k
Input capacitance Ci and inductivity Li are negligible
Sensor supply: 8 V (nominal value)
Approved and certified maximum values
Uo = 8.7 V
Io = 64 mA
Po = 384 mW
Lo = 7.9 mH (IIC)
= 38 mH (IIB)
Co = 5.9 µF (IIC)
= 50 µF (IIB)

**Signal Output**

Active pulses by push/pull amplifier output.
Min. high level: 18 V
Max. low level: 2 V
Sensor supply failure signal indicated by relay output (NO).

**Protection grade provided to the Ex-area**

Ex ia IIC, Ta = -20 °C to +60 °C

**Installation**

The barrier must be installed in a safe (non-hazardeous) area or within an explosion-proof (Ex d) enclosure.

**Enclosure**

Plastic snap-on-track enclosure for 35 mm rail
Protection grade IP20 (NEMA 1)
Dimensions 22.5 x 99 x 114.5 mm
Weight approx. 0.4 kg

**Power Supply**

D461R1.xxU1: 18…40 Vac/Vdc, power requirements approx. 5 W
D461R1.xxU2: 85…250 Vac, power requirements approx. 5 W

**Connectors (Wiring)**

Screw mounting, terminal blocks, accepting 0.2…2.5 mm² cross section

**Operating Conditions**

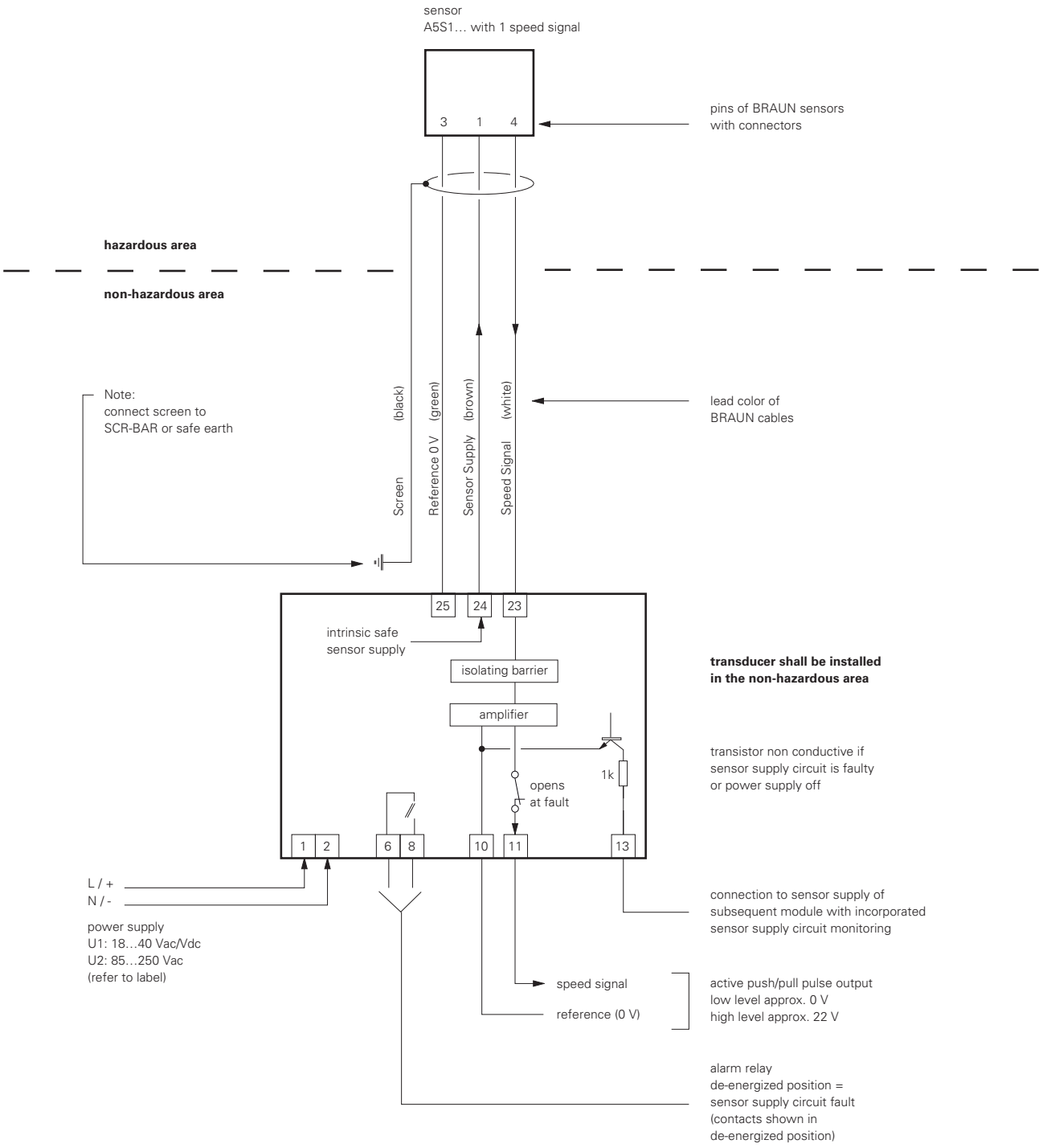
Ambient temperature: -20…+60 °C (-4…+140 °F)
Relative humidity max. 95%, non-condensing

**Available Models**

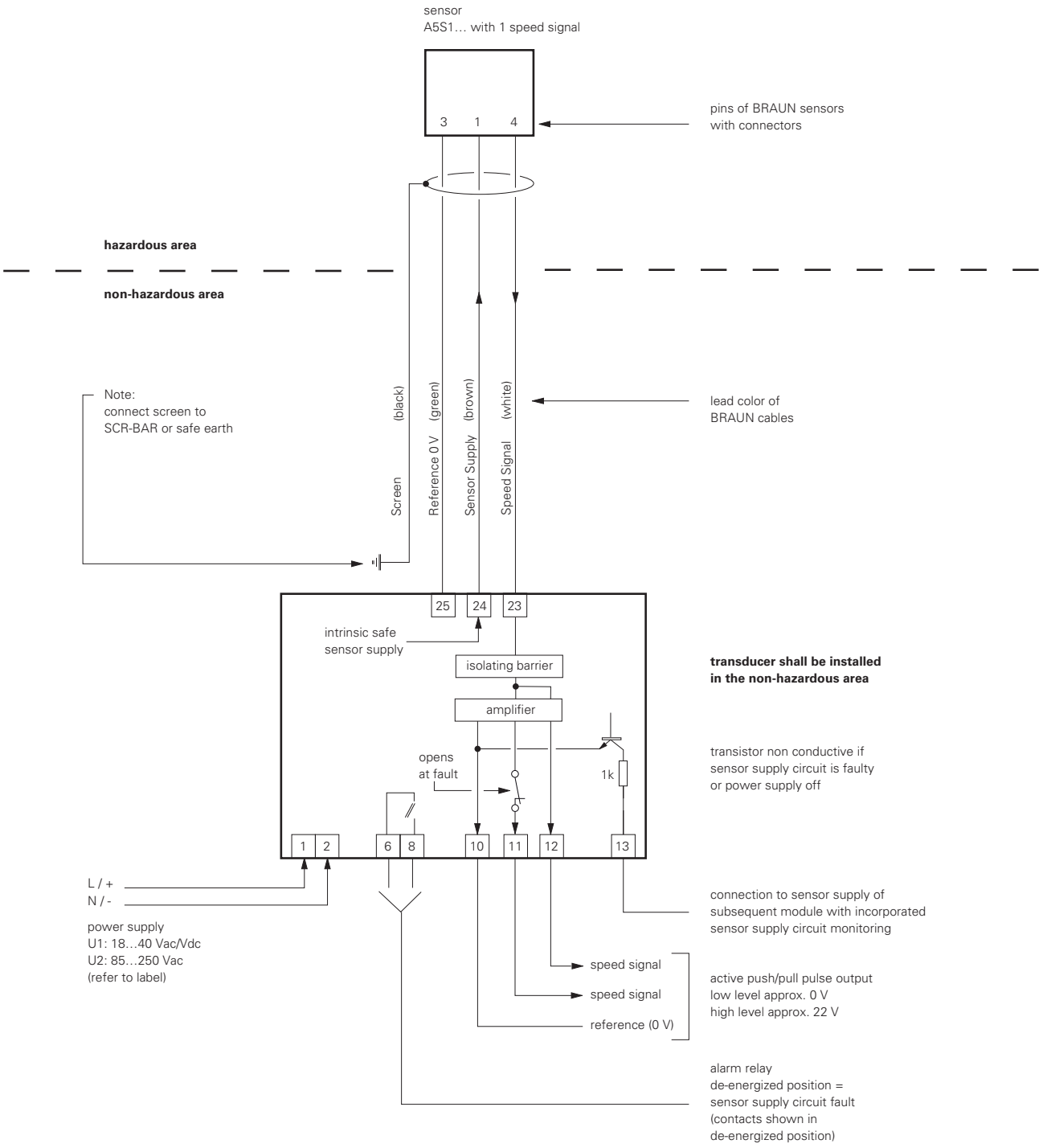
with identical dimensions and input / output specifications

| | Power Supply | In | Out | Application |
|---|---|---|---|---|
| D461R1.11U1<br>D461R1.11U2 | 18...40 Vac/Vdc<br>85...250 Vac | 1 | 1 | one speed signal |
| D461R1.12U1<br>D461R1.12U2 | 18...40 Vac/Vdc<br>85...250 Vac | 1 | 2 | one speed signal<br>with two parallel outputs |
| D461R1.21U1<br>D461R1.21U2 | 18...40 Vac/Vdc<br>85...250 Vac | 2 | 2 | one speed and<br>one direction signal or<br>two speed signals |

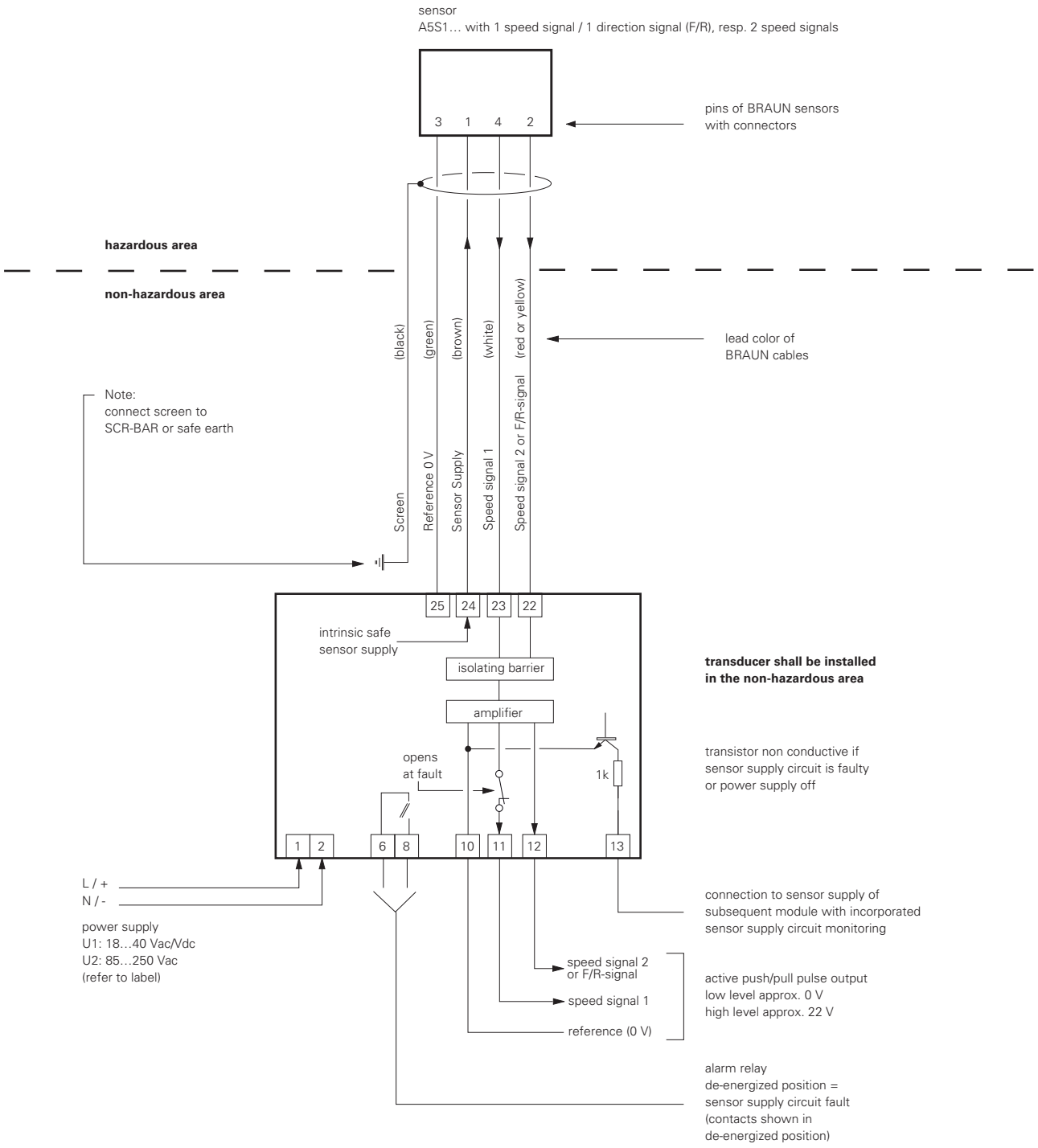
# Function Diagram and Terminal Nos of D461R1.11



# Function Diagram and Terminal Nos of D461R1.12



# Function Diagram and Terminal Nos of D461R1.21



## Ordering Key D461R1

**D461R1. a b**

**Channels incorporated**
a = **11** : 1x signal input into 1x isolated signal output
a = **12** : 1x signal input into 2x isolated signal output parallel
a = **21** : 2x signal input into 2x isolated signal output

**Supply voltage**
b = **U1** : 18…40 Vac/Vdc
b = **U2** : 85…250 Vac

**Examples:**

D461R1.11U2:
with 1 input signal into 1 isolated signal output signal for 85...250 Vac

D461R1.11U1:
with 1 input signal into 1 isolated signal output signal for 18...40 Vac/Vdc

D461R1.12U1:
with 1 input signal into 2 parallel isolated signal output signals for 18...40 Vac/Vdc

D461R1.21U2:
with 2 input signals into 1 each isolated signal output signal for 85...250 Vac

## BRAUN – Speed Monitoring and Protection Systems for Rotating Equipment

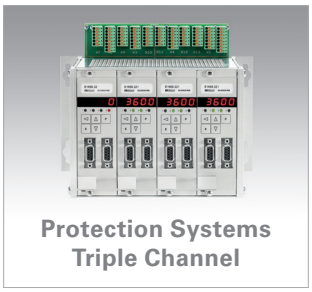
BRAUN Industrial Electronics develops, produces, and supplies "Rotating Equipment" protection systems for industrial applications worldwide, focusing on overspeed protection. These systems comply with the highest standards of safety and availability.

As a globally leading technology provider with over 60 years of experience, BRAUN has been continually meeting and mastering the challenges associated with protecting the facilities of companies within the power generation, oil, gas, and chemical industries. Our protection systems are installed in more than 100 countries worldwide, and our customers use them in safety-critical applications with "Rotating Equipment".

For our OEM customers, BRAUN is both a solution-oriented systems provider and a reliable system partner.

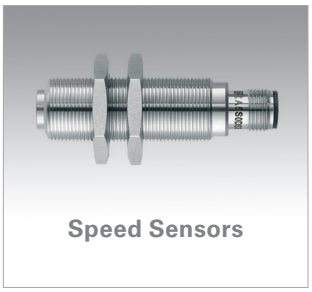
Our solutions comprise a variety of products for the detection and monitoring of speed and related parameters.

Always matching the requirement. Always the perfect solution for safety and availability.



**Protection Systems Triple Channel**

**Protection Systems Single Channel**



**Speed Sensors**

**Tachometers**

**Protecting Your Rotating Equipment**

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