

# Proximity Sensors Line Guide



**Uncommon sense.** Honeywell Safety and Productivity Solutions (S&PS) offers environmentally sealed proximity sensors in a variety of technologies — including Eddy Current Killed Oscillator (ECKO) and Hall-effect. Once a metallic object is detected in front of the sensing face, a signal is passed through the conditioning circuitry to give an output configured according to the sensor application.

These rugged, one- or two-piece products are designed to meet demanding temperature, vibration, shock, and EMI/EMP interference requirements, and are available in a number of housing materials and termination styles. Multiple potential applications are found in the harsh environments of aerospace (landing gear position, doors and slides, monitoring systems), ordnance (projectile sensing, ammunition loading systems) and marine (submarine hatch and door position, offshore equipment).

## FEATURES

### PROXIMITY SENSORS

#### RDS80004 Series.

**Features:** 2-wire dc inductive • Output current is proportional to the applied voltage and is designed to operate at a nominal 16 Vdc with a 1 kOhm load • Results in an output of 8 mA when no wheel is detected, and 2 mA when a wheel is detected • Available in high and low frequency versions

**Benefits:** Non-contact detection of rail wheel flanges at speeds up to 500 km/h. Ease of installation, electrically robust. Enhanced life, low “in track” maintenance. Supports extended lineside transmission distances. Facilitates use in wheel detection systems and fault diagnosis. Potential applications include train detection (presence, direction, speed), train direction detectors, and train axle counters.

#### RDSA Series.

**Features:** Train detection without track circuits • Directional and non-directional operating modes • Requires two wheel detections to validate train presence • Solid state technology • Self monitoring • Can detect train direction or position • Can detect sensor and power supply faults

**Benefits:** Enhanced reliability. Reduces risk of error. Often eliminates problems with leaves, rust, snow, salt, grit, dust, and oil on rails. No rail cutting, drilling, or insulation is required if clamps are used. Can be installed in parallel with the old system, creating minimal changeover time. Potential applications include crossing gate closure on train approach (non fail-safe), train detection for monitoring systems, and wagon location/direction in marshalling yards.

#### RDSB Series.

**Features:** Train detection without track circuits • Directional and non-directional operating modes • Requires two wheel detections to validate train presence • Solid state technology • Self monitoring • Can detect train direction or position

**Benefits:** Enhanced reliability. Can detect sensor and power supply faults. Reduces risk of error. Often eliminates problems with leaves, rust, snow, salt, grit, dust, and oil on rails. No rail cutting, drilling, or insulation is required if clamps are used. Can be installed in parallel with the old system, creating minimal changeover time. Potential applications include crossing gate closure on train approach (non fail-safe), train detection for monitoring systems, and wagon location/direction in marshalling yards.

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## Unprecedented value.

Honeywell S&PS has developed a new inductive sensor line for potential transportation and industrial applications. And every proximity sensing part or solution is infused with our legendary quality:

## Two-wire Vector Impedance

**Technology:** Our patented readout technique, when used with our two-wire proximity sensor, utilizes an algorithm and temperature compensation to provide precision gap measurement. Our proximity sensors have enhanced reliability (over 5 million units and 25 million flight hours for 340FW and 370 FW series).

## Impressive breadth of line:

Honeywell S&PS meets the need of any fragmented market by offering several types of sensors, making us the “one-stop shop” versus niche companies. What’s more, products have been put to use in the field for years.

**Global Channel:** Honeywell S&PS offers worldwide support and manufacturing, an important need in industrial segments.



## Proximity Sensors

### RDS80004 Series

<b>Description</b>	rail wheel proximity sensors
<b>Housing material</b>	Polymide "Grilamid LKN5H"
<b>Oscillating frequency</b>	230 kHz ± 10%; 160 kHz ± 10%
<b>Supply voltage</b>	10 Vdc to 30 Vdc
<b>Operating temperature range</b>	-40 °C to 80 °C [-40 °F to 176 °F]
<b>Output current</b>	Supply voltage and load dependent; 2 mA/8 mA
<b>Operating frequency (f)</b>	> 400 HZ
<b>Vibration</b>	Sinusoidal 10 Hz to 2 kHz 20 g for 30 min, IEC 68-2-2
<b>Nominal sensing distance</b>	26,5 mm, 35mm*

\* See installation guide



## Proximity Sensors

### RDSA Series

### RDSB Series

### RDSC Series

<b>Description</b>	combined train approach and departure system	train detection system – directional and non-directional	train departure control system
<b>Housing type</b>	modular control unit	Relay rack housing	modular control unit
<b>Housing material</b>	Polycarbon	metal	Polycarbon
<b>Supply voltage</b>	20 Vdc to 50 Vdc	20 Vdc to 48 Vdc	10 Vdc to 50 Vdc; 20 Vdc to 50 Vdc
<b>Operating temperature range</b>	-25 °C to 70 °C [-13 °F to 158 °F]	-25 °C to 70 °C [-13 °F to 158 °F]	-25 °C to 70 °C [-13 °F to 158 °F]
<b>Supply current max. @ 25 °C</b>	1500 mA	250 mA	3000 mA; 1500 mA
<b>Output functions</b>	non-vital train approach and vital train departure indication. Other outputs: timers and errors	non-vital train detection at up to four locations or direction at two. Other outputs: fault status relay; extended fault status relay	failsafe train depart relay output. Other outputs: train in island, system active and errors
<b>Number of sensors used</b>	8	up to 4	8 (RDSC012); 6 (RDSC010)
<b>Printer output</b>	yes	no	yes
<b>Train reversing capability</b>	no	yes	yes (RDSC012); no (RDSC010)



## Proximity Sensors

	100 FW Series	200 FW Series	300 FW Series
<b>Description</b>	one-piece 5/8" proximity sensor	one-piece 5/8" proximity sensor	two-piece proximity sensor
<b>Technology</b>	ECKO	hall	ECKO
<b>Target material</b>	all metals	magnet	ferrous metals
<b>Load current</b>	120 mA, 50 mA lamp	100 mA, 50 mA lamp	750 mA
<b>Supply current</b>	20 mA max. @ 25 °C	20 mA max. @ 25 °C	65 mA max.
<b>Sensing face</b>	shielded; unshielded	shielded	shielded
<b>Guaranteed actuation distance</b>	1 mm to 1.99 mm [0.039 in to 0.0783 in]; 5 mm to 10 mm [0.197 in to 0.394 in]	2 mm to 2.99 mm [0.0787 in to 0.1177 in]	1.78 mm to 3.3 mm [0.07 in to 0.130 in]
<b>Operating temperature range</b>	-55 °C to 125 °C [-67 °F to 257 °F]	-54 °C to 100 °C [-65.2 °F to 212 °F]	-77 °C to 125 °C [-106.6 °F to 257 °F]
<b>Supply voltage</b>	18 Vdc to 32 Vdc	18 Vdc to 32 Vdc	18 Vdc to 32 Vdc
<b>Output type</b>	normally open, current sinking	normally open/closed, current sinking	normally open/closed, current sinking



## Proximity Sensors

	21 FW Series	23 FW Series	5 FW Series
<b>Description</b>	one-piece 12 mm proximity sensor	one-piece 22.2 mm proximity sensor	target, special, proximity sensor
<b>Operating frequency</b>	2000 Hz	2000 Hz	n/a
<b>Load current</b>	20 mA	20 mA	n/a
<b>Supply current</b>	25 mA	25 mA	n/a
<b>Housing material</b>	stainless steel	stainless steel	stainless steel
<b>Sensing face</b>	stainless steel	stainless steel	stainless steel
<b>Guaranteed actuation distance</b>	250 Gauss	250 Gauss	n/a
<b>Operating temperature range</b>	-55 °C to 150 °C [-67 °F to 302 °F]	-55 °C to 125 °C [-67 °F to 257 °F]	-55 °C to 150 °C [-67 °F to 302 °F]
<b>Shock</b>	20 g	20 g	n/a
<b>Supply voltage</b>	18 Vdc to 32 Vdc	18 Vdc to 32 Vdc	n/a
<b>BITE</b>	yes	yes	n/a
<b>Short circuit</b>	no	no	n/a
<b>Pressure proof</b>	no	no	n/a
<b>Reverse polarity</b>	no	no	n/a
<b>MTBF (hrs)</b>	35000	115000	n/a
<b>Output type</b>	normally open, current sinking	normally open, current sinking	n/a

# Proximity Sensors Line Guide



## 922 Series Proximity Sensors

**922AA2Y-A6P-Z722A**

**922FS2-A6N-Z735A**

<b>Description</b>	one-piece 15/32" proximity sensor	one-piece 12 mm proximity sensor
<b>Dimension</b>	11.7 mm [0.46 in]	12 mm [0.47 in]
<b>Operating frequency</b>	2000 Hz	2000 Hz
<b>Load current</b>	250 mA	250 mA
<b>Gd (mm)</b>	3.6	2.8
<b>Guaranteed actuation distance</b>	2 mm to 2.99 mm [0.0787 in to 0.1177 in]	1 mm to 1.99 mm [0.039 in to 0.0783 in]
<b>Operating temperature range</b>	-55 °C to 85 °C [-67 °F to 185 °F]	-55 °C to 85 °C [-67 °F to 185 °F]
<b>Shock</b>	6 g 11 ms ABD 0007	6 g 11 ms ABD 0007
<b>Supply voltage</b>	14 Vdc to 32.5 Vdc	14 Vdc to 32.5 Vdc
<b>BITE</b>	no	no
<b>Short circuit</b>	yes	yes
<b>Pressure proof</b>	no	yes
<b>Reverse polarity</b>	no	no
<b>Output type</b>	normally open, current sourcing	normally open, current sourcing



## M12 Proximity Sensors

**ZS-00361**

**932AB2W**

<b>Description</b>	one-piece M12 proximity sensor	one-piece M12 proximity sensor
<b>Load current</b>	80 mA	200 mA
<b>Sensing face</b>	crastin (plastic)	ceramic
<b>Gd (mm)</b>	2.91	6.8
<b>Guaranteed actuation distance</b>	1 mm to 1.99 mm [0.039 in to 0.0783 in]	3 mm to 3.99 mm [0.118 in to 0.157 in]
<b>Operating temperature range</b>	-25 °C to 85 °C [-13 °F to 185 °F]	-40 °C to 100 °C [-40 °F to 212 °F]
<b>Shock</b>	400 g 11 ms	100 g 6 ms
<b>Supply voltage</b>	14 Vdc to 33 Vdc	20 Vdc to 33 Vdc
<b>BITE</b>	no	no
<b>Short circuit</b>	yes	yes
<b>Pressure proof</b>	no	no
<b>Reverse polarity</b>	yes	yes
<b>Insulation resistance</b>	50 Mohm @ 500 Vdc	>50 Mohm @ 500 Vdc
<b>Output type</b>	normally open/closed, current sourcing	normally open, current sourcing



## M18 Proximity Sensors

**ZS-00351-01**

**932AA3W**

<b>Description</b>	one-piece M18 proximity sensor	one-piece M18 proximity sensor
<b>Load current</b>	100 mA	≤200 mA up to 85 °C to 100 mA at 100 °C
<b>Sensing face</b>	ceramic	ceramic
<b>Gd (mm)</b>	7.27	8.5
<b>Guaranteed actuation distance</b>	4 mm to 4.99 mm [0.1574 in to 0.19646 in]	4 mm to 4.99 mm [0.1574 in to 0.19646 in]
<b>Operating temperature range</b>	-35 °C to 63 °C [-31 °F to 145 °F]	-40 °C to 100 °C [-40 °F to 212 °F]
<b>Shock</b>	500 g 0.5 ms	100 g 6 ms
<b>Supply voltage</b>	12 Vdc to 32 Vdc	20 Vdc to 323 Vdc
<b>BITE</b>	yes	no
<b>Short circuit</b>	yes	yes
<b>Pressure proof</b>	no	no
<b>Reverse polarity</b>	yes	yes
<b>Insulation resistance</b>	10 Mohm @ 500 Vdc	>50 Mohm @ 500 Vdc
<b>Output type</b>	normally open, current sinking	normally open, current sourcing



## M30 Proximity Sensors

**ZS-00240-03B**

**ZS-00228-050**

**ZS-00341**

<b>Description</b>	one-piece M30 proximity sensor	one-piece underwater proximity sensor	one-piece underwater proximity sensor
<b>Load current</b>	200 mA	250 mA	≤120 mA
<b>Housing material</b>	stainless steel	polyethylene	stainless steel
<b>Sensing face</b>	ceramic	overmoulded	stainless steel
<b>Gd (mm)</b>	11.64	16	16
<b>Guaranteed actuation distance</b>	5 mm to 10 mm [0.197 in to 0.394 in]	5 mm to 10 mm [0.197 in to 0.394 in]	ZS-00341-01: ≥0.8 mm; ZS-00341-02: ≥21.84 mm
<b>Operating temperature range</b>	-55 °C to 85 °C [-67 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]	-55 °C to 90 °C [-67 °F to 194 °F]
<b>Shock</b>	100 g 6 ms	6 g 11 ms	6 g 11 ms
<b>Supply voltage</b>	14 Vdc to 33 Vdc	10 Vdc to 32.2 Vdc	14 Vdc to 32.5 Vdc
<b>BITE</b>	no	no	no
<b>Short circuit</b>	yes	yes	yes
<b>Pressure proof</b>	no	no	yes
<b>Reverse polarity</b>	yes	yes	yes
<b>Output type</b>	normally open/closed, current sourcing	normally open, current sourcing	normally open, current sourcing

### **RDSC Series.**

**Features:** Train detection without track circuits • Zero speed and bi-directional sensing • Duplex microprocessor system • Relay outputs • Solid state technology • RS 232 diagnostic output • Detects standard rail wheels up to speeds of 281 mph • Connecting wires may be up to 2 miles only (>10,000 ft.) • Sealing to IP 68

**Benefits:** Enhanced reliability. Robust design. Designed to provide fail-safe train depart output. Interfaces with existing crossing controls. Quick installation. Allows proactive maintenance and fault monitoring. Resistant to shock and vibration. Wide temperature range. Polarity independent – voltage may be reversed and sensor still works. Short circuit, overvoltage, and transient protection. Greatly reduces problems with leaves, rust, snow, salt, grit, dust, and oil on rails. Designed for use in potential reversing train applications.

### **100 FW Series.**

**Features:** All metal sensing • Shielded 3-wire dc sinking (NPN) • Small housing • Stainless steel • High level of electronics protection • Leadwire or connector termination

**Benefits:** Enhanced reliability. Environment-proof, self-contained. Enclosed in a rugged hermetically sealed stainless steel housing. Designed to meet the requirements of aerospace, ordnance, marine, mass transit, and high performance industrial equipment. Potential applications include aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **200 FW Series.**

**Features:** Hall-effect, magnetic field sensitive • High frequency switching • Shielded 3-wire dc sinking (NPN) • Small housing • Stainless steel • High level of electronics protection • Leadwire or connector termination

**Benefits:** Enhanced reliability. Environment-proof, self-contained. Enclosed in a rugged hermetically sealed stainless steel housing. Designed to meet the requirements of aerospace,

ordnance, marine, mass transit, and high performance industrial equipment. Potential applications include aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **300 FW Series.**

**Features:** Ferrous metal sensing • Two-piece construction – stainless steel bushing or flange mount sensors and plug-in electronics card • Small size housing • Stainless steel • Reverse polarity • Designed to work in conjunction with Honeywell Sensor Interface Card (405 FW Series) or Sensor Interface Module (ZS-00380 Series)

**Benefits:** The combined sensor and interface system offer highly enhanced reliability. Mean time between failure in excess of 500K hours when used with the Sensor Interface Module (ZS-00380 Series). Sensitive electronics on plug-in card for inside mounting. Enclosed in a rugged hermetically sealed stainless steel housing. Designed to withstand temperature extremes and exposure to salt, humidity, sand, dust, and corrosive fluids such as skydrol and typical aircraft fuels. Potential applications include aircraft landing gear, flight control surfaces, and aircraft door monitoring.

### **21 FW Series.**

**Features:** Hall-effect, magnetic field sensitive • Single channel • 3-wire dc • Small housing • Stainless steel

**Benefits:** Enhanced reliability. Small profile. Enhanced resistance to electromagnetic interference. Competitive cost. Often ideal for many locations on an aircraft, or potential applications with severe shock, vibration, temperature, and EMI environments. Potential applications include door and utility systems, high lift systems, hydraulic systems, valves, engine/thrust reverser systems, power generation systems, environmental control systems, aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **23 FW Series.**

**Features:** Hall-effect, magnetic field sensitive • Triple channel • 9-wire dc • Small housing • Stainless steel

**Benefits:** Enhanced reliability. Small profile. Enhanced resistance to electromagnetic interference. Competitive cost. Often ideal for many locations on an aircraft, or applications with severe shock, vibration, temperature, and EMI environments. Potential applications include door and utility systems, high lift systems, hydraulic systems, valves, engine/thrust reverser systems, power generation systems, environmental control systems, aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **5 FW Series.**

**Features:** Hall-effect, magnetic field sensitive • Small housing • Stainless steel

**Benefits:** Enhanced reliability. Small profile. Enhanced resistance to electromagnetic interference. Competitive cost. Often ideal for many locations on an aircraft, or applications with severe shock, vibration, temperature, and EMI environments. Potential applications include door and utility systems, high lift systems, hydraulic systems, valves, engine/thrust reverser systems, power generation systems, environmental control systems, aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **922AA2Y-A6P-Z722A.**

**Features:** All metal sensing • Stainless steel • Small housing • High frequency switching • High level of electronics protection • Leadwire or connector termination

**Benefits:** Environment-proof. Self-contained. Operation by the Eddy Current Killed Oscillator (ECKO) principle to detect metallic objects passing in front of the sensing face. Designed to meet the requirements of aerospace, ordnance, marine, and mass transit and high performance industrial equipment. Potential applications include aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **922FS2-A6N-Z735A.**

**Features:** All metal sensing • Stainless steel • Small housing • High pressure capability (>350 bar) • High level of electronics protection • Leadwire or connector termination

**Benefits:** Environment-proof. Self-contained. Operation by the Eddy Current Killed Oscillator (ECKO) principle to detect metallic objects passing in front of the sensing face. Designed to meet the requirements of aerospace, ordnance, marine, and mass transit and high performance industrial equipment. Potential applications include aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **ZS-00361.**

**Features:** Hall-effect, magnetic field sensitive • Stainless steel • Small housing • High level of electronics protection • High frequency switching • Leadwire or connector termination

**Benefits:** Environment-proof. Self-contained. Operation by the Eddy Current Killed Oscillator (ECKO) principle to detect metallic objects passing in front of the sensing face. Designed to meet the requirements of aerospace, ordnance, marine, and mass transit and high performance industrial equipment. Potential applications include aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **932AB2W.**

**Features:** All metal sensing • Stainless steel • Small housing • High level of electronics protection • High frequency switching • Leadwire or connector termination

**Benefits:** Environment-proof. Self-contained. Operation by the Eddy Current Killed Oscillator (ECKO) principle to detect metallic objects passing in front of the sensing face. Designed to meet the requirements of aerospace, ordnance, marine, and mass transit and high performance industrial equipment. Potential applications include aircraft

landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **ZS-00351-01.**

**Features:** All metal sensing • Stainless steel • Small housing • High level of electronics protection • Built in test function (BITE) • Leadwire or connector termination

**Benefits:** Environment-proof. Self-contained. Operation by the Eddy Current Killed Oscillator (ECKO) principle to detect metallic objects passing in front of the sensing face. Designed to meet the requirements of aerospace, ordnance, marine, and mass transit and high performance industrial equipment. Potential applications include aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **932AA3W.**

**Features:** Hall-effect, magnetic field sensitive • Stainless steel • Small housing • High level of electronics protection • High frequency switching • Leadwire or connector termination

**Benefits:** Environment-proof. Self-contained. Operation by the Eddy Current Killed Oscillator (ECKO) principle to detect metallic objects passing in front of the sensing face. Designed to meet the requirements of aerospace, ordnance, marine, and mass transit and high performance industrial equipment. Potential applications include aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **ZS-00240-03B.**

**Features:** Hall-effect, magnetic field sensitive • Stainless steel • Small housing • High level of electronics protection • High frequency switching • Leadwire or connector termination

**Benefits:** Environment-proof. Self-contained. Operation by the Eddy Current Killed Oscillator (ECKO) principle to detect metallic objects passing in front of the sensing face. Designed to

meet the requirements of aerospace, ordnance, marine, and mass transit and high performance industrial equipment. Potential applications include aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

### **ZS-00228-050.**

**Features:** All metal sensing • High level sealing by overmoulding • Enhanced performance sealed and shielded cable • Reverse polarity and short circuit protection

**Benefits:** Environment-proof. Self-contained. Enclosed on rugged hermetically sealed ceramic/stainless steel housing and overmoulded to provide complete encapsulation. Operation by the Eddy Current Killed Oscillator (ECKO) principle to detect metallic objects passing in front of the sensing face. Potential applications include submarine control systems, submersible vehicles, offshore underwater equipment, and underwater pipeline controls.

### **ZS-00341.**

**Features:** Ferrous metal sensing • All stainless steel construction including sensing face and laser welded connector • High pressure capability up to 205 bar (system pressure) • Enhanced level of electronics protection • Mean time between failure is 126K hours

**Benefits:** Environment-proof. Self-contained. Enclosed on rugged hermetically sealed ceramic/stainless steel housing and overmoulded to provide complete encapsulation. Operation by the Eddy Current Killed Oscillator (ECKO) principle to detect metallic objects passing in front of the sensing face. Designed to meet the requirements of aerospace and marine applications. Potential applications include aircraft hydraulic systems, fighting vehicle engine/transmission controls, and ship and submarine hydraulic systems.