Honeywell

Position Sensors Line Guide

Precision, down the line. Honeywell Sensing and Control (S&C) Linear and Distance Position Sensors consist of Linear Potentiometric and Ultrasonic products.

Potentiometer Sensors measure linear, rotary position or displacement using technology developed for potential military applications, then adapted to industrial segments. Our proprietary conductive plastic delivers extensive temperature range and infinite resolution, and provides precision position measurement.

SMART Position Sensors (**S**uperior **M**easurement, **A**ccuracy, **R**eliability, and **T**hinking.) enable highly accurate motion control, improving operational efficiency and safety. Measure linear, angular, or rotary movement of a magnet attached to a moving object. Non-contact design eliminates mechanical failure mechanisms, reducing wear and tear, improving reliability and durability, and minimizing downtime. Robust in most harsh environments. Easy to install, reducing set-up costs.

Ultrasonic Sensors measure time delays between emitted and echo pulses, often accurately determining the sensor-to-target distance. These non-contact-based products solve the toughest sensing problems by detecting targets made of virtually any material — regardless of color, transparency, shine or opacity.

FEATURES

LINEAR POTENTIOMETRIC SENSORS

AQLT Series.

Features: 1/2 in body diameter • Multiple finger-wiper design • Extruded wiper block guides • MystR® plastic element • Anodized extruded aluminum housing • Sealed construction • Precious metal contact • Absolute continuous measurement • Infinite resolution • Tolerates clamping loads • Tested up to one billion operations • Intrinsically safe for Class I, II and III Division I, Groups A, B, C, D, E, F, and G for hazardous (indoor/outdoor) NEMA 4 locations

Benefits: Fits in tight spaces and clamps easily to cylinders. Improves shock and vibration performance. Smooth quiet motion; extends operating life. Enhanced performance in hostile environments. Low noise level often. Accurate position at power up. Magnetic actuator replaces the shaft found in traditional linear transducers and often eliminates need for additional stroke length mounting space. Enhanced life and often reliable operation in potential applications including in-tank level sensing, robotic motion control, woodworking guides, seismology, packaging and processing equipment, animated characters, marine steering systems, off-road vehicles, semiconductor process equipment, and medical equipment.

AQMLT Series.

Features: 3/8 in body diameter • Multiple finger-wiper design • Extruded wiper block guides • MystR® plastic element • Anodized extruded aluminum housing • Sealed construction • Precious metal contact • Absolute continuous measurement • Infinite resolution • Tolerates clamping loads • Tested up to one billion operations • Intrinsically safe for Class I, II and III Division I, Groups A, B, C, D, E, F, and G for hazardous (indoor/outdoor) NEMA 4 locations

Benefits: Fits in tight spaces and clamps easily to cylinders. Improves shock and vibration performance. Smooth quiet motion; extends operating life. Enhanced performance in hostile environments. Low noise level over entire life. Accurate position at power up. Magnetic actuator replaces the shaft found in traditional linear transducers and often eliminates need for additional stroke length mounting space. Enhanced life and often reliable operation in potential applications including in-tank level sensing, robotic motion control, woodworking guides, seismology, packaging and processing equipment, animated characters, marine steering systems, off-road vehicles, semiconductor process equipment, and medical equipment.

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Position Sensors Line Guide

Reliable. Quiet. Flexible.
Our position sensors offer every benefit you demand, from resisting extensive vibration to delivering enhanced product life. That's why Honeywell S&C is trusted the world over.

Linear Potentiometric Sensors: These units feature rugged extruded aluminum housings to withstand harsh chemicals and immersion in oils or water. Potential applications include robotic motion control, marine steering, and in-tank level sensing. Construction features include: extended life PTFE bearings, precious-metal multi-finger contact wipers, and MYSTR® conductive plastic thick film elements.

SMART Position Sensors: The non-contacting technology is designed to provide enhanced product life and durability with less downtime. Other benefits are the self-diagnostics feature which reduces equipment downtime and the IP67 and IP69K sealing which allow use in a variety of harsh applications

Ultrasonic: We offer analog or digital units, plus programmable versions for tailored applications — as well as a selection of plastic or stainless-steel housings, and diameters and termination styles. Particularly effective detecting clear or shiny objects, or in particle-laden air and splashing liquid environments. Potential applications include level measurement, height and thickness sensing, and diameter control.

Linear Potentiometric Sensors

	AQLT Series	AQMLT Series
Description	shaftless, waterproof linear position transducer	shaftless, waterproof linear position transducer
Operating temperature range	-40 °C to 80 °C [-40 °F to 176 °F]	-40 °C to 80 °C [-40 °F to 176 °F]
Supply voltage	30 Vdc max.	30 Vdc max.
Linearity	±1%	±1%
Starting force (max.)	56,7 g [2 oz] max.	28,35 g [1 oz] max.
Backlash	NA	NA
Total resistance	6 kOhm to 38 kOhm	750 Ohm to 18 kOhm
Measurement range	127 mm to 965 mm [5 in to 38 in]	12,7 mm to 304,8 mm [0.5 in to 12 in]
Shaft	NA	NA
Total mechanical travel	154,94 mm to 967,74 mm [6.1 in to 38.1 in]	15,24 mm to 307,34 mm [0.6 in to 12.1 in]
Electrical travel	152,4 mm to 965,2 mm [6 in to 38 in]	12,7 mm to 304,8 mm [0.5 in to 12 in]
Housing length	electrical travel + 54,87 mm [2.16 in]	electrical travel + 38,1 mm [1.5 in]
Vibration	20 g/0,75 mm (rms) 5 Hz to 2 kHz	20 g/0,75 mm (rms) 5 Hz to 2 kHz
Shock	50 g 11 ms half sine	50 g 11 ms half sine
Expected operating life	one billion dither operations	one billion dither operations
Resistance tolerance	±20%	±20%
Insulation resistance	500 mOhm at 500 Vdc	500 mOhm at 500 Vdc
Dielectric strength	250 V rms	250 V rms
Termination	cable	cable

Linear Potentiometric Sensors

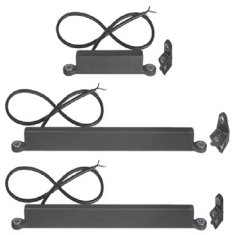
	LFII Series	SLF Series	LT Series
Description	vibration-resistant, plunger-driven linear transducer	short stroke version of the LFII	plunger-driven linear transducer
Operating temperature range	-65 °C to 105 °C [-85 °F to 221 °F]	-65 °C to 105 °C [-85 °F to 221 °F]	-40 °C to 80 °C [-40 °F to 176 °F]
Supply voltage	30 Vdc max.	40 Vdc max.	30 Vdc max.
Linearity	±1%	±1% or ±0.1%	±1%
Starting force (max.)	0,45 kg [1 lb] (standard); LFIIW: 2,27 kg [5 lb] (water resistant)	1 lb (standard) 5 lb (water resistant)	28,35 g max. [1 oz max.] 12 oz max. (water resistant)
Backlash	0,025 mm [0.001 in] max.	0,025 mm [0.001 in] max.	0,00508 mm [0.0002 in] max.
Total resistance	5 kOhm	1.5 kOhm to 9 kOhm	1 kOhm to 10 kOhm
Measurement range	152 mm to 1219 mm [6 in to 48 in]	25 mm to 152 mm [1 in to 6 in]	25 mm to 254 mm [1 in to 10 in]
Shaft	Ø 6,35 mm [0.25 in]	Ø 6,35 mm [0.25 in]	Ø 3,18 mm [0.125]
Total mechanical travel	154,6 mm to 1221,4 mm [6.09 in to 48.09 in]	30,5 mm to 166,2 mm [1.2 in to 6.15 in]	26,7 mm to 255.3 mm [1.05 in to 10.05 in]
Electrical travel	152,4 mm to 1219,2 mm [6 in to 48 in]	25,4 mm to 152,4 mm [1 in to 6 in]	25,4 mm to 254 mm [1 in to 10 in]
Housing length	electrical travel + 81,02 mm [3.19 in]	electrical travel + 77,5 mm [3.05 in]	electrical travel + 38,10 mm [1.50 in]
Vibration	20 g/0,75 mm (rms) 5 Hz to 2 kHz (for vibration levels up to 50 g rms and higher, additional housing clamps are required)	20 g/0,75 mm (rms) 5 Hz to 2 kHz	20 g/0,75 mm (rms) 5 Hz to 2 kHz
Shock	50 g 11 ms half sine	50 g 11 ms half sine	50 g 11 ms half sine
Expected operating life	one billion dither operations	one billion dither operations	one billion dither operations
Resistance tolerance	±20%	±20%	±20%
Insulation resistance	1000 mOhm at 500 Vdc	NA	500 mOhm at 500 Vdc
Dielectric strength	1000 V rms	NA	1000 V rms
Termination	connector, binder series 681	connector, binder series 681	cable

Position Sensors Line Guide

Linear Potentiometric Sensors

	MLT Series	DR Series
Description	plunger-driven linear transducer	Durastar rodless, space-saving side actuator
Operating temperature range	-40 °C to 80 °C [-40 °F to 176 °F]	-65 °C to 105 °C [-85 °F to 221 °F]
Supply voltage	30 Vdc max.	75 Vdc max.
Linearity	±1%	0.1% from 1 to 100 % of theoretical electrical travel
Starting force (max.)	28,35 g [1 oz] max.	0,45 kg [1.0 lb]
Backlash	0,0127 mm [0.0005 in] max.	0,025 mm [0.001 in] max.
Total resistance	750 Ohm to 9 kOhm	2 kOhm to 10 kOhm
Measurement range	13 mm to 152 mm [0.5 in to 6 in]	102 mm to 1270 mm [4 in to 50 in]
Shaft	Ø 3,18 mm [0.125]	M5 x 0.8
Total mechanical travel	13,97 mm to 153,67 mm [0.55 in to 6.05 in]	106 mm to 1275 mm [4.2 in to 50.2 in]
Electrical travel	12,7 mm to 152,4 mm [0.5 in to 6 in]	101.6 mm to 1270 mm [4 in to 50 in]
Housing length	electrical travel + 30,48 mm [1.2 in]	250 mm to 1418 mm [9.84 in to 55.83 in]
Vibration	20 g/0,75 mm (rms) 5 Hz to 2 kHz	20 g/0,75 mm (rms) 5 Hz to 2 kHz
Shock	50 g 11 ms half sine	50 g 11 ms half sine
Expected operating life	one billion dither operations	one billion dither operations
Resistance tolerance	±20%	±20%
Insulation resistance	500 mOhm at 500 Vdc	1000 mOhm at 500 Vdc
Dielectric strength	1000 V rms	1000 V rms
Termination	cable	Hirschmann GDM

SMART Position Sensor
Superior **M**easurement.
Accuracy. **R**eliability. **T**hinking.



	SPS Series 75 mm Analog and 225 mm Analog and Digital Linear Configurations	SPS Series 100° and 180° Arc Configurations	SPS Series 360° Rotary Configuration
Description	Enables highly accurate motion control, improving operational efficiency and safety. Non-contact design eliminates mechanical failure mechanisms, reducing wear and tear, improving reliability and durability, and minimizing downtime. Robust in most harsh environments. Easy to install, reducing set-up costs.		
Configuration	linear	arc	rotary
Sensing range	75 mm: 0 mm to 75 mm [0 in to 3.0 in] 225 mm: 0 mm to 225 mm [0 in to 8.86 in]	100°: 0° to 100° 180°: 0° to 180°	0° to 360°
Resolution	75 mm analog: 0,05 mm [0.002 in] 225 mm analog: 0,14 mm [0.0055 in] 225 mm digital: 0,0035 mm [0.000137 in]	100°: 0.06° 180°: 0.11°	0.01°
Supply voltage	6 Vdc to 24 Vdc	6 Vdc to 24 Vdc, 18 Vdc to 24 Vdc	12 Vdc to 30 Vdc
Supply current	75 mm analog: 32 mA max. 225 mm analog: 34 mA max. 225 mm digital: 88 mA max.	45 mA max.	90 mA max.
Output	75 mm and 225 mm analog: 0 Vdc to 5 Vdc 225 mm digital: RS232 type	0.5 Vdc to 4.5 Vdc	4 mA to 20 mA
Air gap	3,0 mm ±2,5 mm [0.118 in ±0.098 in]	100°: 7,8 ±2,5 mm [0.307 ±0.098 in] 180°: 8,5 ±2,5 mm [0.338 ±0.098 in]	3,0 ±2,0 mm [0.118 ±0.079 in]
Operating temperature range	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
Storage temperature range	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]
Sealing	IP67, IP69K	IP67, IP69K	IP67, IP69K
Housing material	thermoplastic	thermoplastic	aluminum with powder coating
Approvals	CE	CE	CE

Position Sensors Line Guide

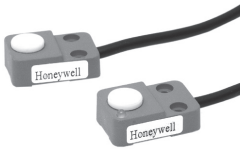
Ultrasonic Sensors

	940-F/947 Series	941-D Series
Range type	from 0,6 m to 3 m [2 ft to 10 ft]	from 0,4 m to 3,5 m [1.3 ft to 11.5 ft]
Output type	analog or switching	analog or switching
Supply voltage	19 Vdc to 30 Vdc	15 Vdc to 30 Vdc
Housing style	plastic M18 and M30	plastic square housing
Termination type	cable or connector	connector
Beam angle	8°	10°
Response time	50 ms, 90 ms	150 ms
Switching frequency	100 ms, 1 Hz, 8 Hz, 25 Hz	10 Hz
Repeatability	0.3% or ±1 mm; 0.2% or ±2 mm	±1 mm
Software programmable	no	no
Teach in	no	yes
Remote teach in	no	no
Synchronization output	yes	yes

Ultrasonic Sensors

	942 Series	943 Series
Range type	from 1,5 to 3,5 m [4.9 ft to 11.5 ft]	from 0,2 to 3,5 m [0.7 ft to 11.5 ft]
Output type	analog and switching	analog or switching
Supply voltage	19 Vdc to 30 Vdc	15 Vdc to 30 Vdc
Housing style	plastic M30	metal M12, plastic M18 and M30
Termination type	connector	cable or connector
Beam angle	8°, 10°	8°
Response time	100 ms	400 ms
Switching frequency	5 Hz to 30 Hz; 5 Hz to 8 Hz	100 ms, 250 ms, 1.2 Hz, 4.7 Hz
Repeatability	0.4% or 2 mm; 0.2% or ±1 mm	0.2% or ±2 mm
Software programmable	yes	no
Teach in	yes	yes
Remote teach in	no	yes
Synchronization output	yes	no

Ultrasonic Sensors



	944 Series	946 Series	948 Series
Range type	from 0,4 m to 3,5 m [1.2 ft to 11.5 ft]	from 0,3 m to 6 m [0.93 ft to 19.69 ft]	0,3 m [1 ft]
Output type	analog and switching	analog and switching	switching
Supply voltage	19 Vdc to 30 Vdc	10 V to 30 V	18 Vdc to 30 Vdc
Housing style	plastic M18 and M30	stainless steel M30	2 pieces square plastic
Termination type	connector	M12 connector	cable
Beam angle	8°	5°	8°
Response time	–	21 ms, 65 ms, 145 ms, 195 ms, 285 ms, 850 ms	–
Switching frequency	0,8 Hz, 1 Hz, 8 Hz	–	–
Repeatability	0.4% or ±2 mm	< 0.1%	–
Software programmable	no	no	no
Teach in	yes	yes	no
Remote teach in	no	no	no
Synchronization output	no	no	no

LFII Series.

Features: Vibration-damped element • Extruded wiper carrier guides • Precious metal wipers • MystR® plastic elements • Stainless-steel shaft • Enhanced dc level output • Enhanced performance bearings • Infinite resolution • Absolute continuous measurement • Shaft seals • Water-resistant option available • Metric Series available • Tested up to one billion operations • Intrinsically safe for Class I, II and III Division I, Groups A, B, C, D, E, F, and G for hazardous (indoor/outdoor) NEMA 4 locations

Benefits: No wiper bounce in high vibration environments. Smooth, easy operation under high side loads and large misalignment. Provides enhanced performance, low noise, no oxidation. Works with simple controllers. Enhanced life even under side load conditions. Often accurate position at power-up. Protects internal components from harsh environments. Potential applications include injection molding machines, printing presses, meat packing equipment, drill presses, woodworking machines, cranes, front-end loaders, and scales.

SLF Series.

Features: Precious metal wipers • 0.081 in thick housing with 6 mm [0.25 in] shaft • MystR® plastic elements • High level dc output • Enhanced performance bearings • Absolute continuous measurement • Shaft seals • Infinite resolution • Water-resistant option available • Tested up to one billion operations • Intrinsically safe for Class I, II and III Division I, Groups A, B, C, D, E, F, and G for hazardous (indoor/outdoor) NEMA 4 locations

Benefits: Provides enhanced performance, low noise. Rugged construction for manufacturing environment. Enhanced life even with side load conditions. Protects internal components from factory environment. Often accurate position at power-up. Works with simple controls. Provides a high resolution, often absolute position measurement without external signal conditioners. Potential applications include injection molding machines, printing presses, meat packing equipment, drill presses, woodworking machines, cranes, and front-end loaders.

LT Series.

Features: 1/2 in diameter • Dual-wiper design • Extruded wiper-block guides • MystR® plastic element • Stainless-steel shaft • Anodized extruded aluminum housing • Precious metal contact • Absolute continuous measurement • Shaft seals for spray-or-hose-down environments • Infinite resolution • Enhanced reliability • Tested up to one billion operations • Intrinsically safe for Class I, II and III Division I, Groups A, B, C, D, E, F, and G for hazardous (indoor/outdoor) NEMA 4 locations

Benefits: Fits into tight spaces, clamps easily to cylinders. Improves shock and vibration performance. Smooth, quiet motion; enhances operating life. Tolerates clamping loads. Rugged construction to withstand hostile environments. Often accurate position at power up. Provides usable output at high vibration levels for long periods. Diameter is among the smallest available and can replace displacement transducers in many applications. Potential applications include animated characters, gauging, fluid flow meters, seismology, semiconductor processing, linear actuators, hospital beds, and other medical equipment.

MLT Series.

Features: 3/8 in diameter • Dual-wiper design • Extruded wiper-block guides • MystR® plastic element • Stainless-steel shaft • Internal spring-loaded ball joint • Anodized extruded aluminum housing • Precious metal contact • Absolute continuous measurement • Infinite resolution • Enhanced reliability • Tested up to one billion operations • Intrinsically safe for Class I, II and III Division I, Groups A, B, C, D, E, F, and G for hazardous (indoor/outdoor) NEMA 4 locations

Benefits: Fits into tight spaces, clamps easily to cylinders. Improves shock and vibration performance. Smooth, quiet motion; extends operating life. Tolerates clamping loads. Rugged construction to withstand hostile environments. Often Often accurate position at power up. Provides usable output at high vibration levels for long periods. Reduces error from shaft misalignment. Diameter is among the smallest available and can replace displacement transducers in many applications. Potential applications include animated characters, gauging, fluid flow meters, seismology, semiconductor processing, linear actuators, hospital beds, and other medical equipment.

DR Series.

Features: Vibration-damped element • Extended side bearing • Extruded wiper-carrier guides • Rugged ribbed housing • Precious metal wipers • MystR® plastic elements • High dc level output • Enhanced performance bearings • Absolute continuous measurement • Infinite resolution • NEMA 4 sealing • Tested up to one billion operations • Intrinsically safe for Class I, II and III Division I, Groups A, B, C, D, E, F, and G for hazardous (indoor/outdoor) NEMA 4 locations

Benefits: No wiper bounce in high vibration environments. Improved life under high misalignment. Smooth, whisper-quiet operation under large misalignment. Rugged construction to withstand hostile environments. Provides enhanced performance, low noise, no oxidation. Works with simple controllers. Enhanced life even under side load conditions. Often accurate position at power-up. This long lasting, rodless, side-sealed transducer may be used to replace rodded potentiometers in contaminated applications. Potential applications include injection molding machines, printing presses, meat packing equipment, drill presses, woodworking machines, cranes, front-end loaders, and scales.

SMART POSITION SENSOR SPS Series.

Features: • Linear, arc and rotary configurations available • Reliable, durable • Easy to install • Rugged • Flexible • Cost effective • Accurate • Adaptable • Simplifies design-in • Self-

diagnostics • Combined patented MR sensor and ASIC technology • IP67 and IP69K sealing • RoHS-compliant

Benefits: Variety of configurations provide application flexibility. Non-contact design reduces wear and tear, improving reliability and durability, and minimizing downtime. Because there are no moving parts within the sensor, Honeywell utilizes unique packaging materials that make the sensor more resistant to vibration, shock, and extreme temperatures. Variety of output options (mA, Vdc analog and RS232-type baud rates) are available, expanding application opportunities. Adaptable, non-contacting design allows customers to eliminate unnecessary connections for installation, thereby reducing installation steps, installation time, and components. Electronics on board allow for flexible packaging and component compatibility with existing systems. Self-diagnostics feature can reduce equipment downtime by providing predictive maintenance input. Combined patented MR sensor and ASIC technology provides enhanced differentiation and performance. IP67 and IP69K sealing allow use in many harsh applications. RoHS-compliant materials meet Directive 2002/95/EC. Potential applications include valve position, material handling, plastic molding, cutting and slitting, wafer handling, CNC machines, passenger bus level position, truck-mounted crane outrigger position, heavy equipment attachment position, hydraulic cylinders, aerial work lift platform position, rail-road crossing arms position, remote weapon systems elevation, ground-based solar panels elevation and azimuth, robotically-assisted surgery equipment position, steering and articulation angle, boom arm detection, solar panes and wind turbines.

ULTRASONIC SENSORS

940-F/947 Series.

Features: Maximum scan ranges from 0,6 m to 3,0 m [1.96 ft to 19.68 ft] • Plastic housing M18 (for 0,6 [1.96 ft] and 1,5 m [4.92 ft] models), M30 (for 3,5 m [11.48 ft] models) • Chemical-resistant epoxy heads • High sealing IP67 • Pre-leaded 2,0 m [78.75 in] or M12 connector models • Synchronizing/hold input • Adjustment by potentiometer • Micro-processor controlled • Temperature compensation

Benefits: Easy to use. Provide unprecedented ultrasonic power in a very small package. Provide one switching output (PNP or NPN open collector). Powerful ultrasonic beam detects even targets with bad ultrasonic characteristics (angled, soft, absorbent, and pulverulent). M18 or M30 package allows mounting in narrow places. Adjustment is simply performed by a potentiometer. The high-sealing IP67, plastic housing, and the epoxy head provide enhanced resistance in aggressive environments like food and beverage or raw materials processing factories. Other potential applications include bottle counting, food processing machinery, filling machinery, crop handling machinery, and ground flatness detection for vehicles.

941-D Series.

Features: Limit switch-style sensor • Maximum scan range is 3,5 m [11.48 ft] • Plastic housing • Teach in • Sealing to IP67 • M12 connector, 5 pin • Visual indication • Four output options; analog (0 Vdc to 10 Vdc and 4 mA to 20 mA) and 2 PNP or 2 NPN switching outputs • Synchronizing/hold input • Two switch point adjustment via teach-in sequence • Temperature compensation • Easy installation • Competitively priced • Not affected by dust, light, and color • CE and UL/CSA approved

Benefits: Provides all high-end sensor features in a limit switch-style housing. Longer scanning distanced than inductive technology. Up to 3500 mm scanning distance with significantly reduced dead zones. Hysteresis adjustment and Microsoft® Windows® function are available, making this sensor an excellent replacement for more expensive devices. 32 mm thickness allows installation even if the space in potential application is reduced. Meets demanding application requirements including presence detection, applications with restricted space, slitter and rewinder machines, cranes, and loop control.

942 Series.

Features: Four models with scan ranges from 0,9 m to 3,0 m [2.95 ft to 9.84 ft] • Stainless steel M30 heads, IP65 • Plastic control box with screw terminals, IP40 • Synchronizing/hold input • Ultrasonic beam power (sensitivity) adjustable by switch • Four switching outputs, open collector PNP: set points 1 and 2, adjustable by coded wheels; underrange (target close), overrange (target far or absent) • NO/NC adjustable by switch • Two analog outputs (4 mA to 20 mA and 0 Vdc to 10 Vdc) • Temperature compensation • Most versatile sensors of all the product range • May be mounted in remote or difficult places (top of tanks, inside of machinery, hot places, etc.)

Benefits: Control box is mountable on DIN rail and houses all the adjustments. Adjustment can be performed in a matter of seconds via the coding wheels and switches on the front panel of the control box. Advanced programming is done on a PC, connected with the RS-232 link. The software (under Microsoft® Windows®) provides a very easy man-machine interface with extended possibilities: digital signal processing parameters, cycle time, slope, etc. Potential applications include loop control, tank level measurement (liquids, crops, etc.), reel diameter measurement, and tire manufacturing.

943 Series.

Features: Remote teach-in/auto-tuning Windows and hysteresis mode • Scanning distances with minimized dead zone and extended maximum ranges from 60 mm to 3500 mm [2.4 in to 137.7 in] • Two switching outputs (each can be either NO or NC) or analog outputs (either voltage, 0 Vdc to 10 Vdc or current 4 mA to 20 mA) are available • Temperature compensation • Connector (M12, 5 pin) or cable version available • Plastic M18 or M30 (depending on the scanning ranges) with IP67

Benefits: Remote teach-in/auto-tuning of the switching or analog outputs. High power, small package, high sealing and chemical resistance. Can be located where space is at a premium. Ideal for

potential industrial applications including reel diameter measurement, tank level measurement, presence absence of a person or object, loop control, product height measurement, and tire manufacturing.

944 Series.

Features: Eight models with scan ranges from 0,35 m to 3,5 m [1.14 ft to 11.48 ft] • Auto-tuning by one switch • Slope direction selection • NO/NC selection • Two switching outputs (open collector PNP) • Analog output (4 mA to 20 mA or 0 Vdc to 10 Vdc) • Temperature compensation • M12 five-pin connector • M12 female connector included • Plastic M30 housing, IP67

Benefits: Provides the fullest range of functions in a complete package. Solves an even wider range of applications due to its very simple programming by auto-tuning. High power, small package, high sealing, chemical resistance. Potential applications include loop control, product height measurement, tank level measurement (liquids, crops, etc.), reel diameter measurement, and tire manufacturing.

946 Series.

Features: Scan ranges from 0,3 m to 6,0 m [0.93 ft to 19.68 ft] • Auto-tuning by four positions plug • Independent/ Windows® output choice (switching output models) • Stainless steel M30 housing, IP65 • Two switching outputs, open collector PNP • Temperature compensation • M12 four-pin connector • Connector cable 2,0 m [78.75 in] included

Benefits: Provides a compromise between easy usage and advanced features. Adjustment is easily done by auto-tuning. By inserting a plug with four positions, one can program the sensor in a matter of seconds; the parameters are stored in a non-volatile memory (EEPROM). Potential applications include loop control, product height measurement, tank level measurement (liquids, crops, etc.), reel diameter measurement, and tire manufacturing.

948 Series.

Features: Sensing distance up to 300 mm [12 in] • Available in four output configurations: NO PNP, NO NPN, NC PNP, NC NPN • Switching frequency of 150 Hz • 2 m [78.8 in] cable • IP67 sealing • Compact size

Benefits: Easy to install in limited space applications. Thru-scan detection regardless of the object material for enhanced detection. Non-contact distance sensing for use in non-invasive measurement. Reduced sensitivity to light intensity/reflectivity/opacity of target for enhanced flexibility and certainty of measurement. Detects over a much longer distance than other detection methods reducing the need for close proximity to the target. Presence absence, tank-fill level and diameter measurement provides a robust and flexible measurement method. Potential applications include food and beverage, rapid presence/ absence detection, bottle counting, and loop control.

Warranty. Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

For more information about Sensing and Control products, visit www.honeywell.com/sensing or call +1-815-235-6847
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