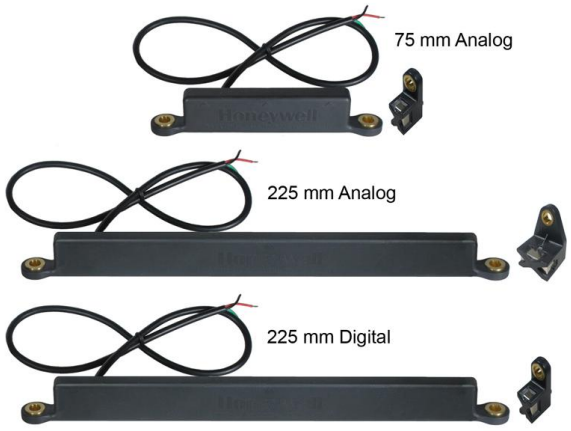
Honeywell

SMART Position Sensor, 75 mm and 225 mm Linear Configurations

Superior **M**easurement.
Accurate. **R**eliable. **T**hinking.



DESCRIPTION

The SMART Position Sensor is one of the most durable, adaptable, and lightweight linear position sensors available in the industry, enabling highly accurate motion control and improving operation efficiency and safety. Its simple, non-contact design eliminates mechanical failure mechanisms, reducing wear and tear, improving reliability and durability, and minimizing downtime.

The SMART Position Sensor is a non-contacting sensing solution for absolute position sensing with enhanced accuracy. It senses the position of a magnet relative to the sensor in one of two available sensing ranges:

- 0 mm to 75 mm [0 in to 3.0 in]
- 0 mm to 225 mm [0 in to 8.86 in]

Why is the SMART Position Sensor smart? SMART means that this is a sensor that can essentially think for itself. SMART Position Sensors provide a self-diagnostics feature and data gathering for enhanced reliability and closed-loop feedback control.

They use a patented combination of an ASIC (Application-Specific Integrated Circuit) and an array of MR (magnetoresistive) sensors to accurately and reliably determine the position of a magnet attached to a moving object so that the object's position can be determined or controlled.

The MR array measures the output of the MR sensors mounted along the magnet's direction of travel. The output and the MR sensor sequence determine the nearest pair of MR sensors to the center of the magnet location. The output of these two MR sensors is then used to determine the position of the magnet between them.

With this sensor, Honeywell has utilized MR technology through the ASIC at a level never before accomplished.

The SMART Position Sensor is available in both analog output (75 mm and 225 mm configurations) and digital output (225 mm configuration only) for use in control systems requiring a RS232-type interface with a 57.6 kbits/s baud rate.

Other configurations are in development.

FEATURES AND BENEFITS (★= competitive differentiator)

★ **Reliable, durable:** Non-contact design reduces wear and tear, improving reliability and durability, and minimizing downtime

★ **Easy to install:** Installation takes four simple steps (1: position device; 2: drill holes; 3: mount sensor; 4: locate magnet/connect three wires) vs. up to 14 steps some competitive products require, simplifying installation and reducing set-up costs

- **Rugged:** As 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

★ **Flexible:** Air gap of up to 3,0 ±2,5 mm [0.118 ±0.098 in] between sensor and magnet expands application opportunities; variety of output options (analog standard and other RS232-type baud rates) are available, expanding application opportunities

★ **Cost effective:** Adaptable, non-contacting design allows customers to eliminate unnecessary connections for installation, thereby reducing installation steps, installation time, and components

- **Accurate:** 75 mm configuration accurately measures values down to 0,05 mm [0.002 in], while 225 mm configuration accurately measures value down to 0,14 mm [0.0055 in] (analog) and 0,0035 mm [0.000137 in] (digital)

★ **Adaptable:** Electronics on boards allow for flexible packaging and component compatibility with existing systems

★ **Lightweight:** More than 50% lighter in weight than LVDT (Linear Variable Differential Transformer) technology

- **Simplifies design-in:** Easy-to-configure sensor array fits virtually any linear movement path, simplifying design-in

★ **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

SMART Position Sensor

POTENTIAL APPLICATIONS

(Apply to both 75 mm and 225 mm configurations except where noted.)

Industrial

- Valve position: May be used to monitor valve position so the desired amount of liquid is delivered based on the position of the valve that is opening/closing, and how long open/closed (e.g., bottling machines, food/chemical processing, water handling equipment, etc.).
- Material handling: May be used on a lifting device that moves cartons from one conveyor belt to another.
- Plastic molding: May be used for injection positioning.
- Cutting and slitting: May be used in paper mills to accurately control the location of the slitter before it cuts.
- Wafer handling: May be used to monitor if parts are properly placed.
- CNC machines: May be used to monitor tool depth and direction of travel.

Transportation

- Passenger bus level position: May be used for passenger bus leveling to simplify access for passengers and luggage.
- Truck-mounted crane outrigger position: May be used to determine that the outriggers are fully deployed before the lifting of objects can begin.
- Heavy equipment attachment identification: May be used to sense which attachments are being deployed onto heavy equipment by the strategic placement of the magnet to the sensor. The corresponding output indicates to the operator and control system which attachment is connected.
- Hydraulic cylinders: May be used on non-ferrous hydraulic cylinders for non-contact stroke position (225 mm configuration only).
- Marine motors: May be used for trim position on inboard/outboard motors for enhanced durability and performance.

Medical

- Syringe pumps: May be used to monitor syringe plunger position to deliver the correct amount and rate of medication to the patient.

Aerospace

- Aircraft actuators: May be used to control actuator position on multiple applications in the aircraft, helping to regulate airflow to engines and environmental systems.

Table 1. Specifications

Characteristic	Component	Parameter		
		75 mm	225 mm	
		Analog (SPS-L075-HALS)	Analog (SPS-L225-HALS)	Digital (SPS-L225-HDLS)
Sensing range	sensor only	0 mm to 75 mm [0 in to 3.0 in]	0 mm to 225 mm [0 in to 8.86 in]	
Resolution		0,05 mm [0.002 in]	0,14 mm [0.0055 in]	0,0035 mm [0.000137 in]
Supply voltage		6 Vdc to 24 Vdc		
Output		0 Vdc to 5 Vdc		RS232-type digital
Supply current		32 mA max.	34 mA max.	88 mA max.
Linearity		±0.4% full scale output		
Reverse polarity		26.4 V at 125 °C [257 °F]		
Sensitivity		50 mV/mm typ.	17.78 mV/mm typ.	282.16 counts/mm typ.
Update rate		400 µs		3200 µs
Baud rate		–		57.6 kbits/s
Initial startup time		30 ms		
Termination		flying leads: red = supply voltage, black = ground, green = output		
Cable bend radius		40 mm [1.6 in] min.		
Operating temperature	sensor and magnet actuator	-40 °C to 125 °C [-40 °F to 257 °F]		
Storage temperature		-40 °C to 150 °C [-40 °F to 302 °F]		
Air gap		3,0 ±2,5 mm [0.118 ±0.098 in]		
Sealing		IP67, IP69K		
Shock		50 G half sine wave with 11 ms duration		
Vibration		20 G from 10 Hz to 2000 Hz	10 G from 10 Hz to 2000 Hz	
Housing material		thermoplastic		
Approvals		CE		
Mounting: screws recommended torque		¼-20 or M6 6 N m to 8 N m [53.1 in lb to 70.8 in lb]		
Material	magnet actuator only	neodymium		
Strength		10,000 Gauss		

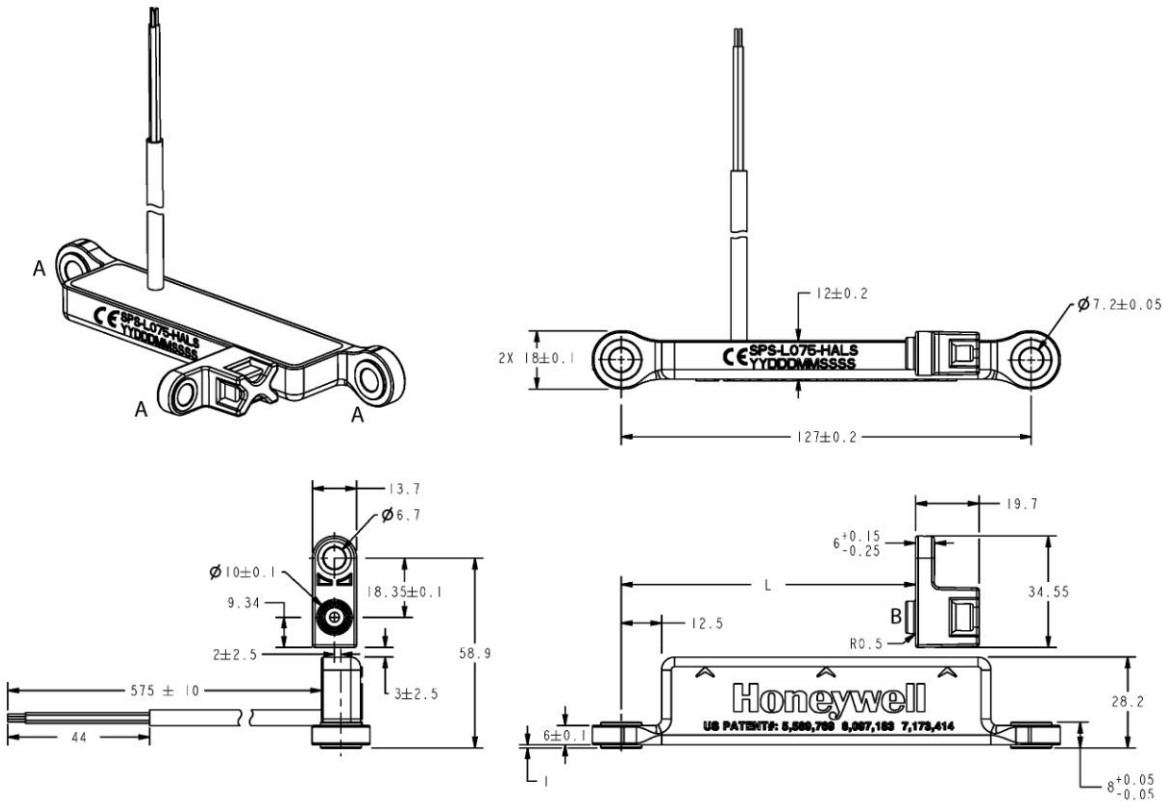
Notes:

- Percent linearity is the quotient of the measured output deviation from the best fit line at the measured temperature to the full scale output span.

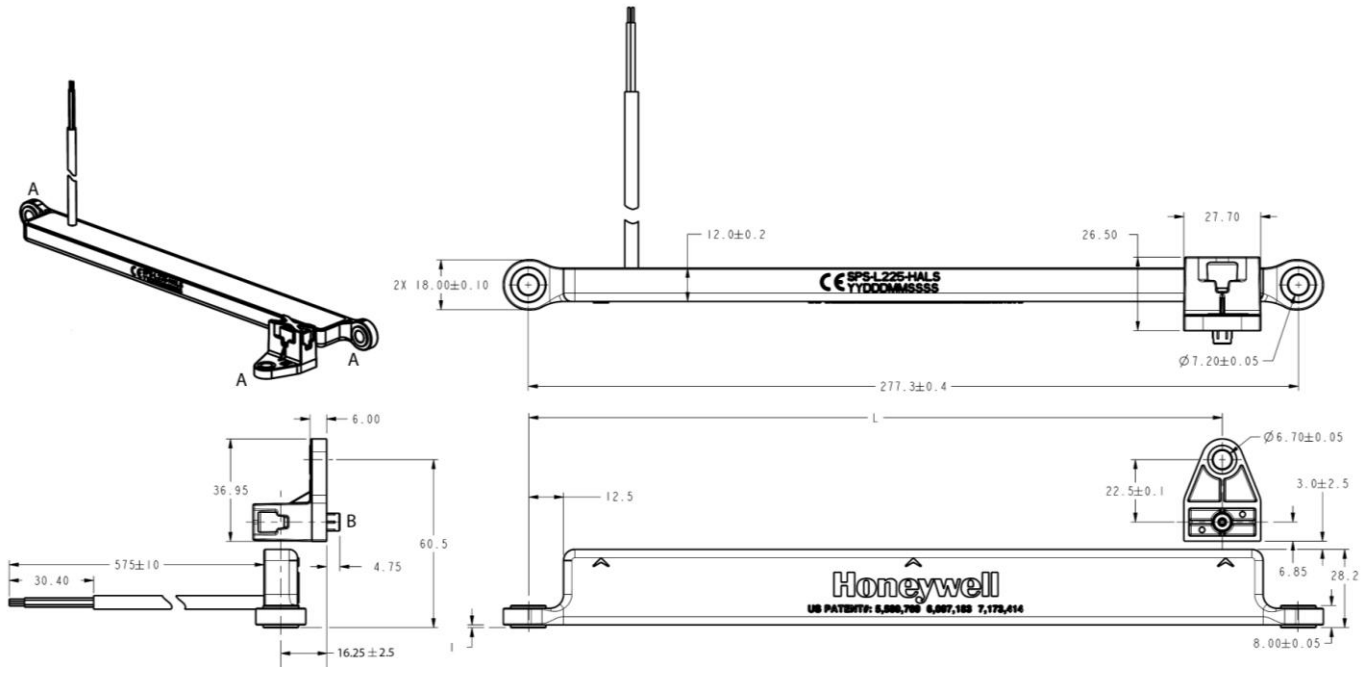
75 mm and 225 mm Linear Configurations

Figure 1. Dimensional Drawings (For reference only: mm)

SPS-L075-HALS (75 mm Analog)

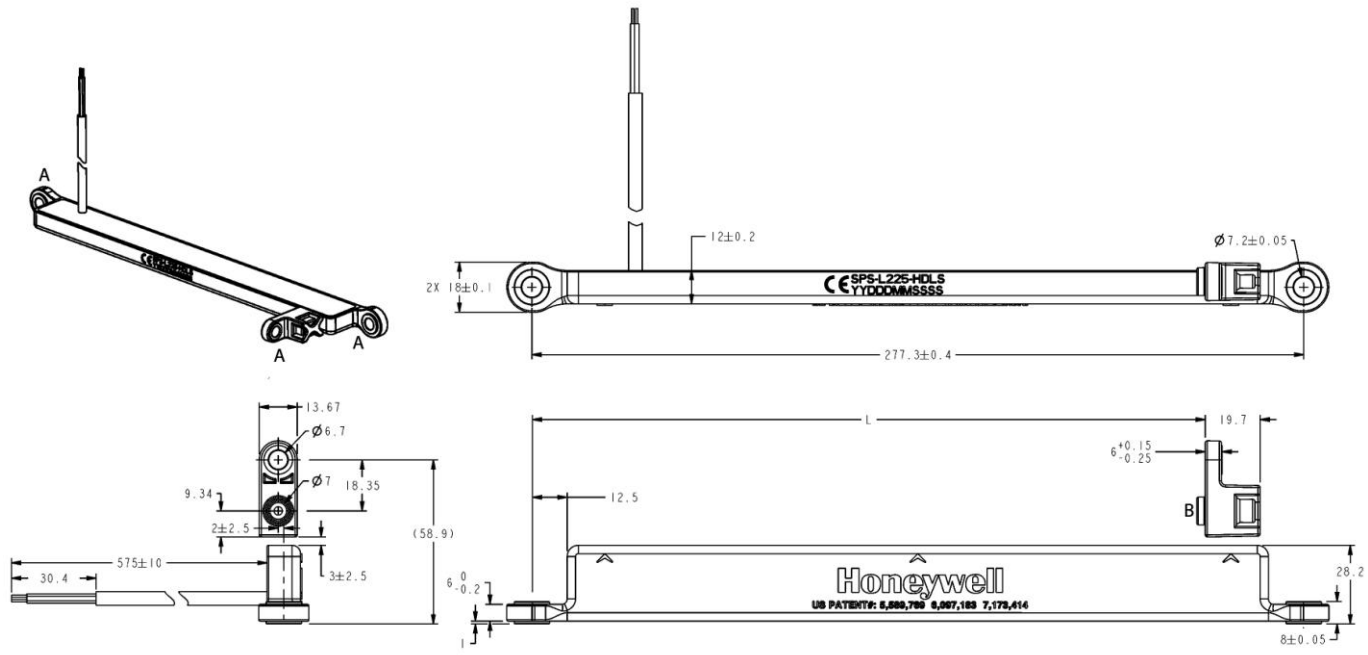


SPS-L225-HALS (225 mm Analog)



SMART Position Sensor

SPS-L225-HDLS (225 mm Digital)



A = Mounting ear	**B** = Mounting dog

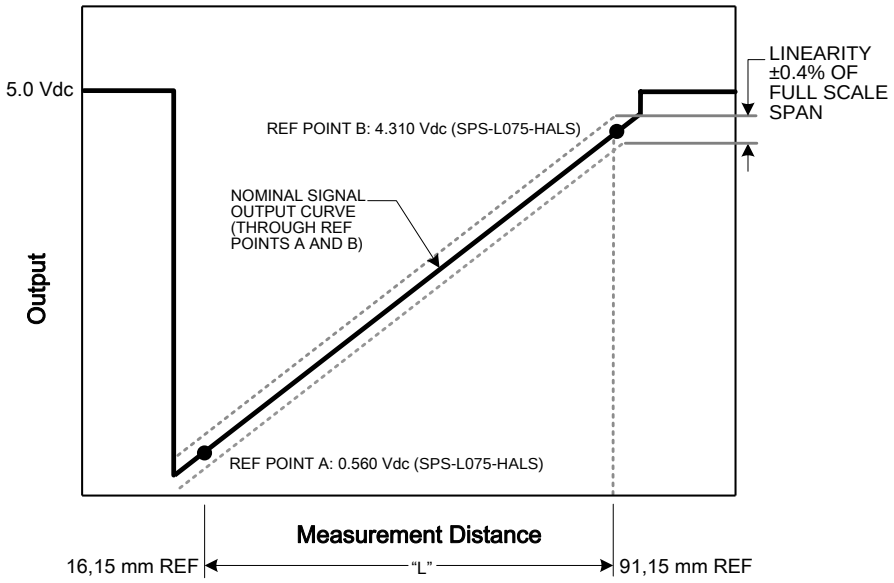
NOTICE

Ferrous metal within a 100 mm [3.9 in] radius of the magnet may affect sensor performance.

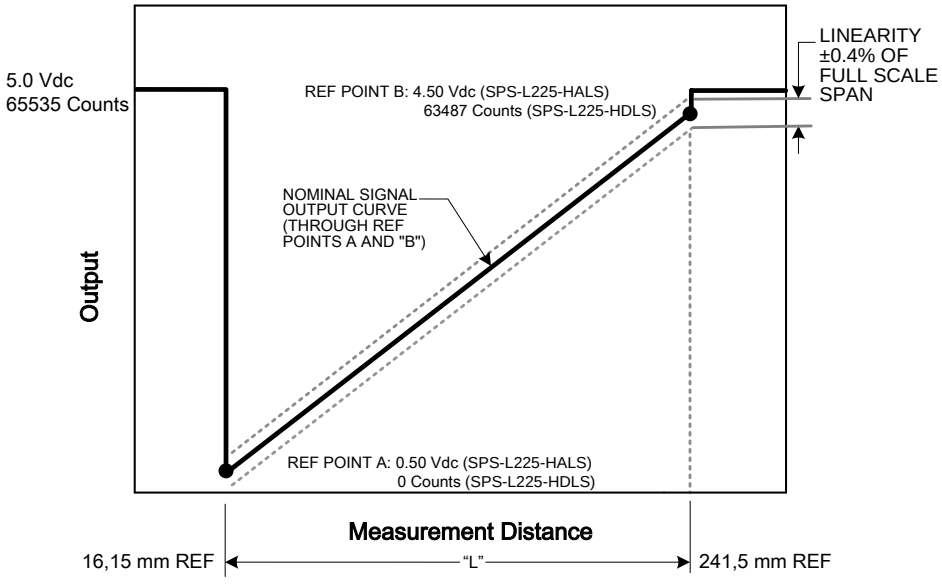
75 mm and 225 mm Linear Configurations

Figure 2. Sensor Output Performance Charts Showing Ideal Outputs

SPS-L075-HALS (75 mm Analog)



SPS-L225-HALS (225 mm Analog), SPS-L225-HDLS (225 mm Digital)



Note: See Fig. 1 for location of "L".

Order Guide

Catalog Listing	Description
SPS-L075-HALS	SMART Position Sensor, 75 mm linear configuration, 0 mm to 75 mm [0 in to 3.0 in] sensing range, 0 Vdc to 5 Vdc analog output, magnet actuator included
SPS-L225-HALS	SMART Position Sensor, 225 mm linear configuration, 0 mm to 225 mm [0 in to 8.86 in] sensing range, 0 Vdc to 5 Vdc analog output, magnet actuator included
SPS-L225-HDLS	SMART Position Sensor, 225 mm linear configuration, 0 mm to 225 mm [0 in to 8.86 in] sensing range, RS232-type digital output with 57.6 kbits/s baud rate, magnet actuator included

Note: Contact Honeywell for alternative allowable magnet orientations.

⚠ WARNING

PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

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 other 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.

⚠ WARNING

MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

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