INSTALLATION INSTRUCTIONS FOR THE SMART POSITION SENSOR, 35 MM, 75 MM, 225 MM LINEAR CONFIGURATIONS

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Issue 8

GENERAL INFORMATION

Why is the SMART Position Sensor smart? SMART means that this is a sensor that can essentially think for itself. The SMART Position Sensor has the ability to self-calibrate because it uses 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 (e.g., elevator, valve, machinery, etc.) so that the object's position can be determined.

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.

MOUNTING AND WIRING INFORMATION

(see Figure 2)

1. Locate sensor and magnet in desired position. Ensure:
   - Air gap between sensor and magnet does not exceed that given in Tables 1- 4 (depending upon model)
   - Alignment of magnet along length of sensor does not exceed 2,0 mm ±2,5 mm [0.078 in ±0.098 in] from the center line of each component
2. Mount sensor:
   - Drill two holes, one for each mounting ear.
   - Secure sensor using two 1/4-20 or M6 screws through each mounting ear
   - Torque screws to 6 Nm to 10 Nm [53.1 in-lb to 88.5 in-lb]
3. Mount magnet (Does not apply to 35 mm version.):
   - Drill two holes:
     - One for the single mounting ear
     - One at 10,25 mm ±0.10 mm [0.403 in ±0.004 in] dia., and at least 3 mm [0.118 in] deep, for the mounting dog (helps stabilize magnet)
   - While ensuring the mounting dog is seated in its hole, secure magnet using one 1/4-20 or M6 screw through the mounting ear
   - Torque screws to 6 Nm to 10 Nm [53.1 in-lb to 88.5 in-lb]
4. Wire sensor according to the lead colors given in the related figures. (Does not apply to 35 mm version.)

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TABLE 1. 35 mm SPECIFICATIONS (Analog: SPS-L035-LATS)				
	Min.	**Typ.**	**Max.**	**Units**
Sensor Charactertistics				
Sensing range	0		35	mm
Supply voltage	4.75	5	5.25	Vdc
Supply current	–	–	20	mA
Output type	Ratiometric			
Output at min. pos	–	0.6	–	Vdc
Output at max. pos	–	4.2	–	Vdc
Full scale span	–	3.6	–	Vdc
Sensitivity	102	103	104	mV/mm
Linearity	± 1.0%			Full scale output
Resolution	40			µm
Update rate	476			µS
Reverse polarity	-5			V
Startup time	5			mS
Connector				
Termination	Tyco Super seal 282087-1 integral connector			
Cable bend radius	n/a			
Operating Environment				
Operating temperature	-40°C to 125°C [-40°F to 257°F]			
Storage temperature	-40°C to 150°C [-40°F to 302°F]			
Air gap	8,5 mm ±1,0 mm [0.334 in ±0.039 in]			
Ingress protection	IP67, IP69K			
Radiated immunity	100 V/m per ISO 11452-2			
Conducted immunity	100 mA BCI per ISO 11452-4			
Mechanical shock	50 G half sine wave with 11 ms duration			
Vibration	20 G from 10 Hz to 2000 Hz			
Certification				
Certification/approval	CE, UKCA			
Mounting				
Housing	Thermoplastic			
Mounting screws	1/4-20 or M6			
Mounting torque	6 Nm to 10 Nm [53.1 in-lb to 88.5 in-lb]			
Recommended Magnet				
Magnet	Neodymium Iron Boron			
Field strength	13500			Gauss

Device used to read analog output must have input impedance greater than 100 KOhm.

Sensor is able to output two diagnostic values as follows
a) Magnet out of range - Output ≤95 % of power rail
b) Operational error - Output ≥5 % of power rail
Possible operational errors include a timeout while waiting for a bridge measurement, a master/slave communication error, an EEPROM checksum error, or a RAM parity error.

TABLE 2. 75 mm SPECIFICATIONS (Analog: SPS-L075-HALS)				
	Min.	**Typ.**	**Max.**	**Units**
Sensor Charactertistics				
Sensing range	0	–	75	mm
Supply voltage	6	–	24	Vdc
Supply current	–	–	32	mA
Output type	Regulated			
Output at min. pos	–	4.31	–	Vdc
Output at max. pos	–	0.561	–	Vdc
Full scale span	–	3.75	–	Vdc
Sensitivity	-48	-50	-52	mV/mm (negative slope)
Linearity	± 0.4%			Full scale output
Resolution	50			µm
Update rate	400			µS
Reverse polarity	-26.4 at 125 °C			V
Startup time	30			mS
Connector				
Termination	Flying leads			
Cable bend radius	40 mm [1.6 in] min.			
Operating Environment				
Operating temperature	-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 mm ±2,5 mm [0.118 in ±0.098 in]			
Ingress protection	IP67, IP69K			
Radiated immunity	100 V/m per ISO 11452-2			
Conducted immunity	100 mA BCI per ISO 11452-4			
Mechanical shock	50 G half sine wave with 11 ms duration			
Vibration	20 G from 10 Hz to 2000 Hz			
Certification				
Certification/approval	CE, UKCA			
Mounting				
Housing	Thermoplastic			
Mounting screws	1/4-20 or M6			
Mounting torque	6 Nm to 10 Nm [53.1 in-lb to 88.5 in-lb]			
Recommended Magnet				
Magnet	Neodymium Iron Boron			
Field strength	10000			Gauss

Device used to read analog output must have input impedance greater than 100 KOhm.

Sensor is able to output two diagnostic values as follows
a) Magnet out of range - Output ≤95 % of power rail
b) Operational error - Output ≥5 % of power rail
Possible operational errors include a timeout while waiting for a bridge measurement, a master/slave communication error, an EEPROM checksum error, or a RAM parity error.

Min position and max position of magnet should be represented in drawing

TABLE 3. 225 mm SPECIFICATIONS (Analog: SPS-L225-HALS)				
	Min.	**Typ.**	**Max.**	**Units**
Sensor Charactertistics				
Sensing range	0	–	225	mm
Supply voltage	6	–	24	Vdc
Supply current	–	–	34	mA
Output type	Regulated			
Output at min. pos	–	4.5	–	Vdc
Output at max. pos	–	0.5	–	Vdc
Full scale span	–	4	–	Vdc
Sensitivity	-17.07	-17.78	-18.49	mV/mm (negative slope)
Linearity	± 0.4%			Full scale output
Resolution	140			µm
Update rate	400			µS
Reverse polarity	-26.4 at 125 °C			V
Startup time	30			mS
Connector				
Termination	Flying leads			
Cable bend radius	40 mm [1.6 in] min.			
Operating Environment				
Operating temperature	-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 mm ±2,5 mm [0.118 in ±0.098 in]			
Ingress protection	IP67, IP69K			
Radiated immunity	100 V/m per ISO 11452-2			
Conducted immunity	100 mA BCI per ISO 11452-4			
Mechanical shock	50 G half sine wave with 11 ms duration			
Vibration	10 G from 10 Hz to 2000 Hz			
Certification				
Certification/approval	CE, UKCA			
Mounting				
Housing	Thermoplastic			
Mounting screws	1/4-20 or M6			
Mounting torque	6 Nm to 10 Nm [53.1 in-lb to 88.5 in-lb]			
Recommended Magnet				
Magnet	Neodymium Iron Boron			
Field strength	13500			Gauss

Device used to read analog output must have input impedance greater than 100 KOhm.

Sensor is able to output two diagnostic values as follows
a) Magnet out of range - Output ≤95 % of power rail
b) Operational error - Output ≥5 % of power rail
Possible operational errors include a timeout while waiting for a bridge measurement, a master/slave communication error, an EEPROM checksum error, or a RAM parity error.

Min position and max position of magnet should be represented in drawing

Figure 1. SPS-L035-LATS Mounting Dimensions and Sensor Output Performance Graph (for reference only: mm)

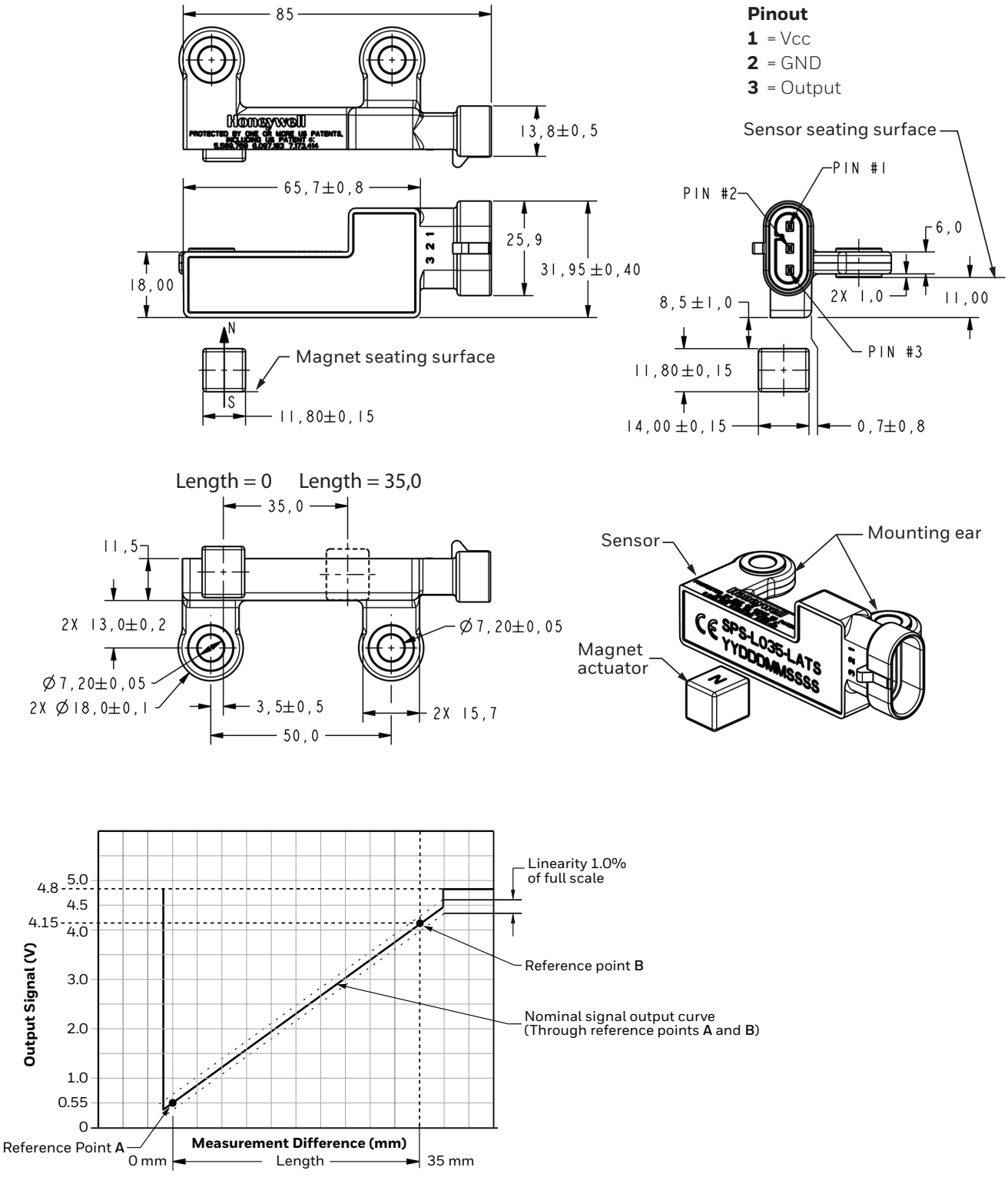


Figure 2. SPS-L075-HALS Mounting Dimensions and Sensor Output Performance Graph (for reference only: mm)

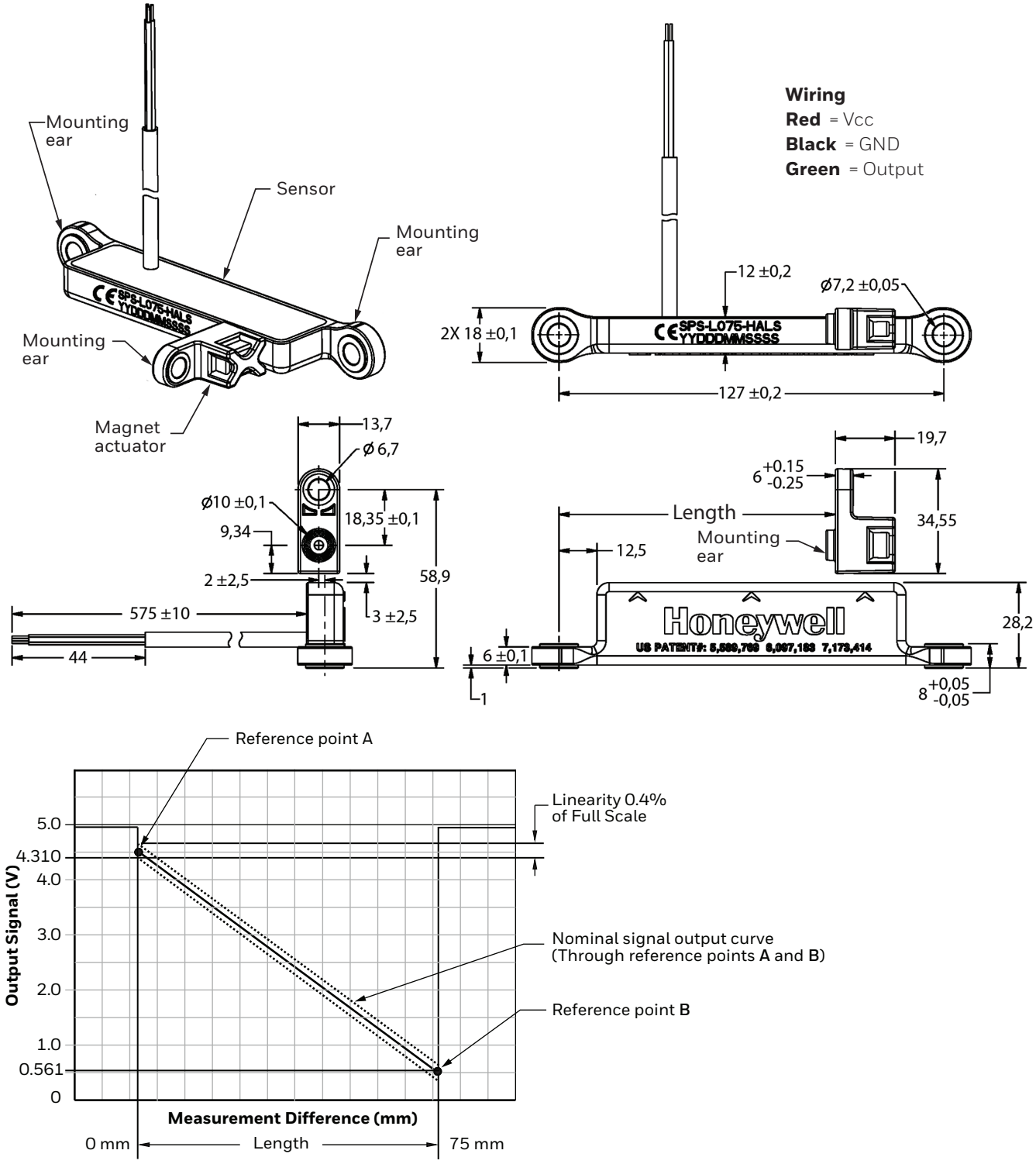
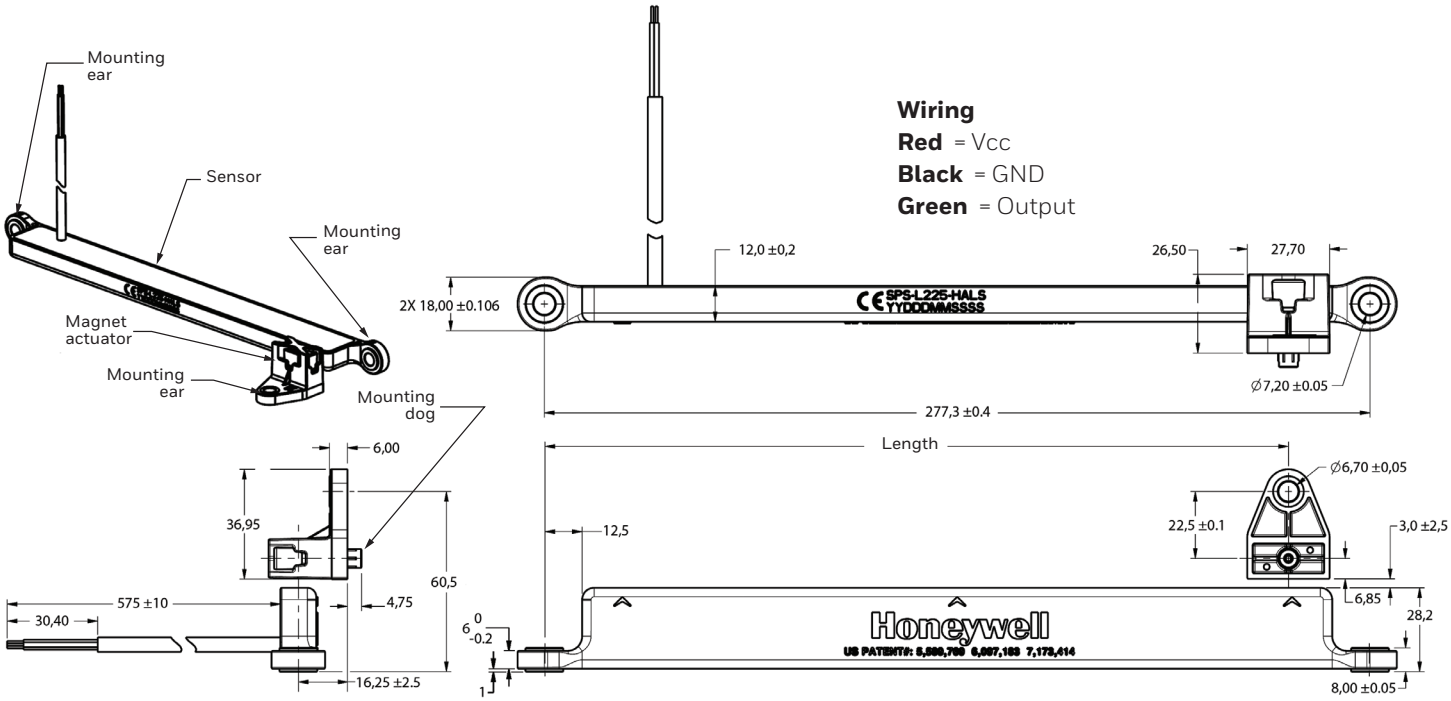
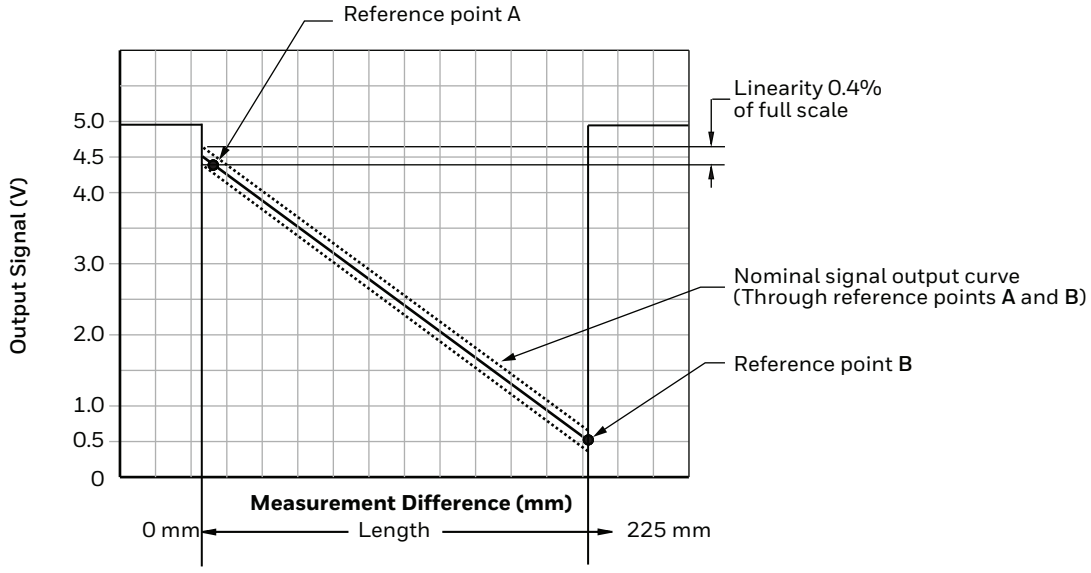


Figure 3. SPS-L225-HALS Mounting Dimensions and Sensor Output Performance Graph (for reference only: mm)





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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.

⚠ 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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50046793-8-EN | 8 | 02/24
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