

# SMART Position Sensor

## POTENTIAL APPLICATIONS

### Transportation

- Aerial work lift platform, front end loader and digger/excavator boom position
- Scissor lift position
- Refuse truck lift and automatic reach arm position
- Mobile crane steering
- Timber harvester/processor equipment cutter arm angle
- On-board loader weighing system position

### Industrial

- Telescoping conveyor elevation
- Power generation contact angle
- Rail-road crossing arms position

### Military

- Remote weapon systems elevation
- Chassis suspension systems position height
- Military vehicle door position

### Aerospace:

- Ground-based solar panels elevation and azimuth
- Ground-based satellite dish elevation and azimuth

### Medical:

- Robotically-assisted surgery equipment position
- Patient bed elevation

For more information on these potential applications, please see the application note "[SMART Position Sensor, 100° and 180° Arc Configurations](#)".

Table 1. Specifications

Characteristic	Component	Parameter					
		100° Arc				180° Arc	
		SPS-A100D-HAMS	SPS-A100D-VAMS	SPS-A100D-HAWS	SPS-A100X-LAAS0401	SPS-A180D-HAMS	SPS-A180D-VAMS
Sensing range	sensor only	0° to 100°				0° to 180°	
Sensing location on arc		inside		outside		inside	
Resolution		0.06°				0.11°	
Supply voltage		6 Vdc to 24 Vdc	18 Vdc to 40 Vdc	6 Vdc to 24 Vdc	5 Vdc	6 Vdc to 24 Vdc	18 Vdc to 40 Vdc
Output		0.5 Vdc to 4.5 Vdc (10% to 90% of 5 Vdc)					
Supply current		45 mA max.			30 mA max.	45 mA max.	
Linearity		±0.4% full scale output					
Reverse polarity		26.4 Vdc	40 Vdc	26.4 Vdc	N/A	26.4 Vdc	40 Vdc
Sensitivity		40 mV/° ±4% FS				22.22 mV/° ±4% FS	
Measurement frequency		312 Hz typ.					
Termination		4-pin M12 connector		18 AWG flying leads	Ampseal 16 connector (p/n 776536)	4-pin M12 connector	
Operating temperature	sensor and magnet actuator	-40 °C to 85 °C [-40 °F to 185 °F]					
Storage temperature		-40 °C to 150 °C [-40 °F to 302 °F]					
Air gap		7,8 ±2,5 mm [0.307 ±0.098 in]			9,2 ±2,5 mm [0.36 ±0.09 in]	8,58 ±2,5 mm [0.338 ±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					
Housing material		thermoplastic					
Approvals		CE					
Mounting: screws recommended torque		M6 or 1/4-20 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:

- Tolerance applies for full sense range.
- Device used to read analog output must have input impedance greater than 1 MOhm.
- The output voltage outside of the valid measurement range will be indeterminate.
- 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.
- Mating connector: 776536-1.

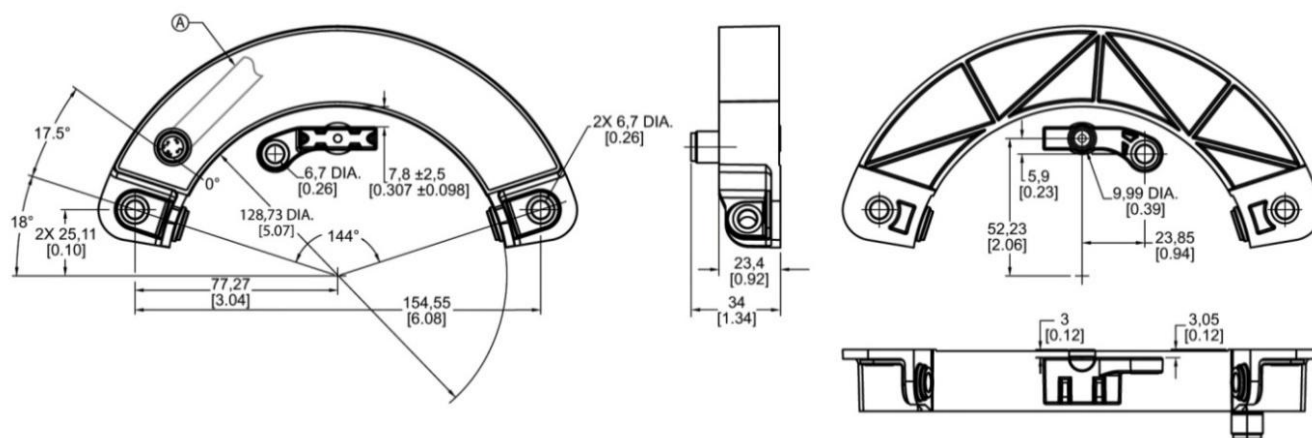
#### NOTICE

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

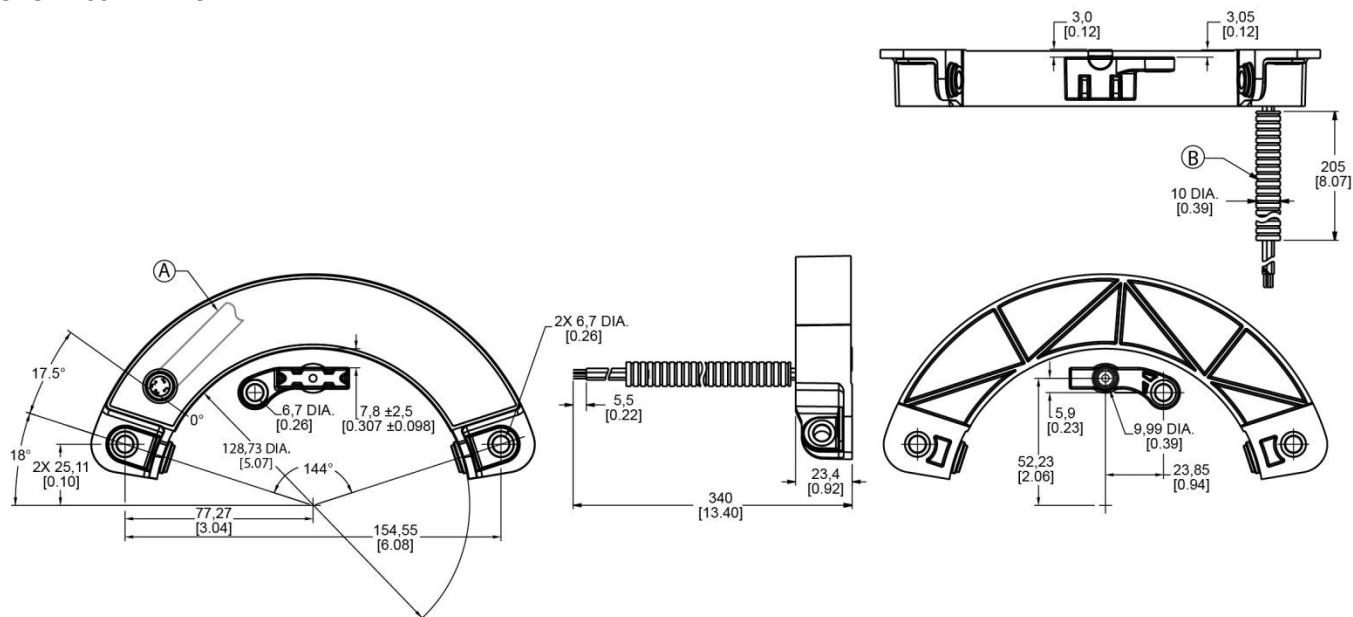
# 100° and 180° Arc Configurations

Figure 1. Dimensional Drawings (For reference only: mm/[in].)

## SPS-A100D-HAMS, SPS-A100D-VAMS



## SPS-A100D-HAWS



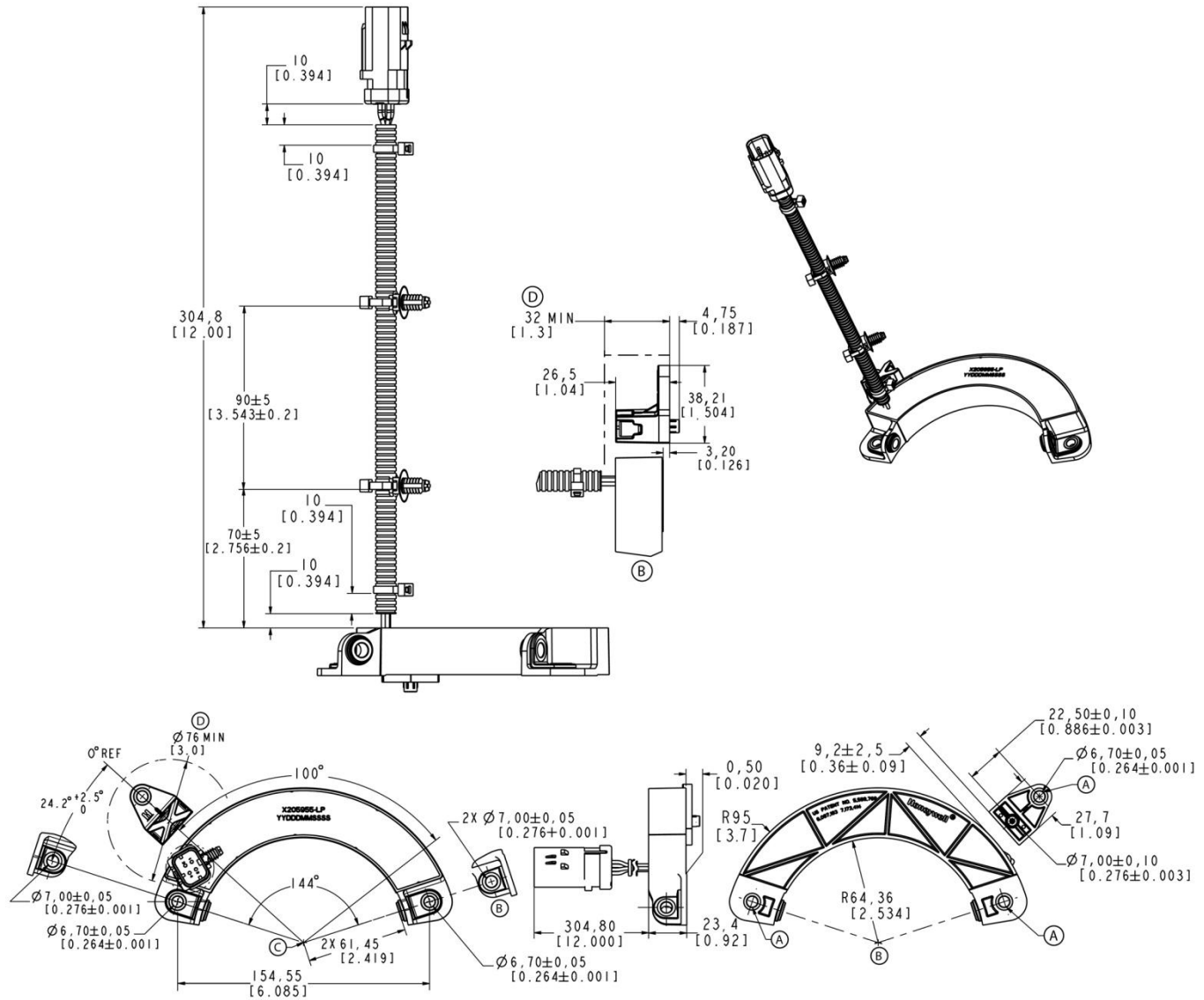
A = Cable direction for right angle connector

B = Polyethylene conduit

# SMART Position Sensor

Figure 1. Dimensional Drawings (For reference only: mm/[in], continued.)

SPS-A100X-LAAS0401



- A** = Magnet pin locating hole
- B** = Partial view
- C** = Rotating axis center
- D** = Magnetic sensitive zone: protect with a non-ferrous metal shield

# 100° and 180° Arc Configurations

Figure 1. Dimensional Drawings (For reference only: mm/[in], continued.)

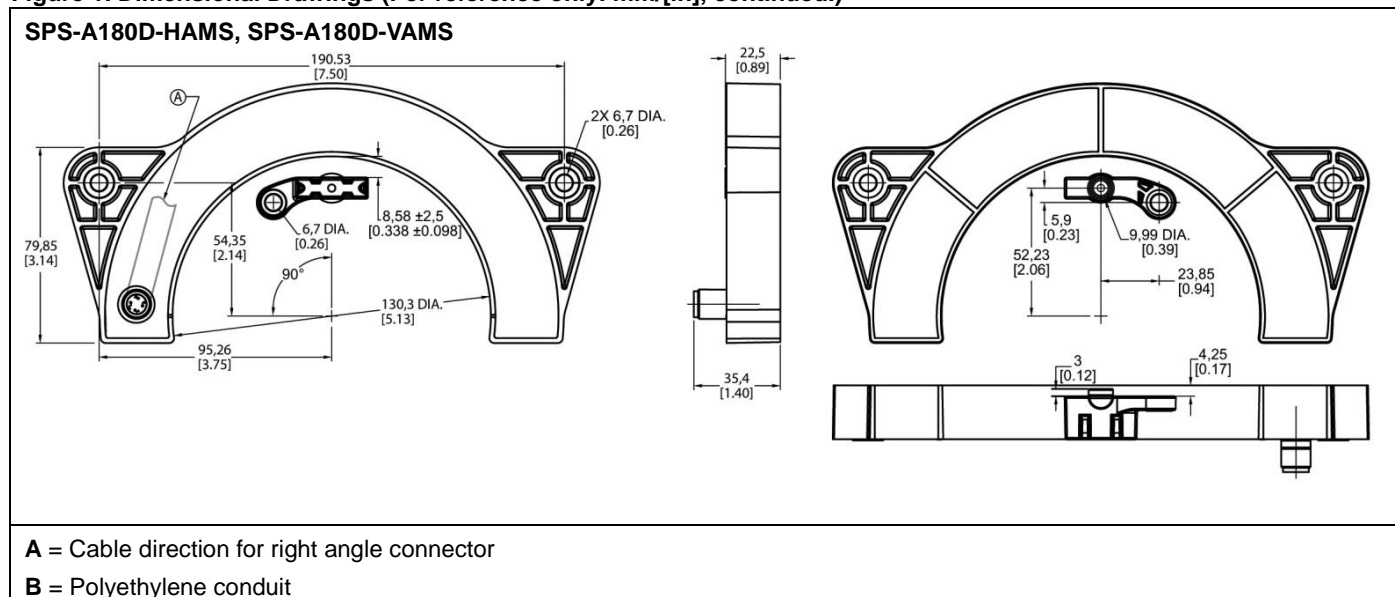
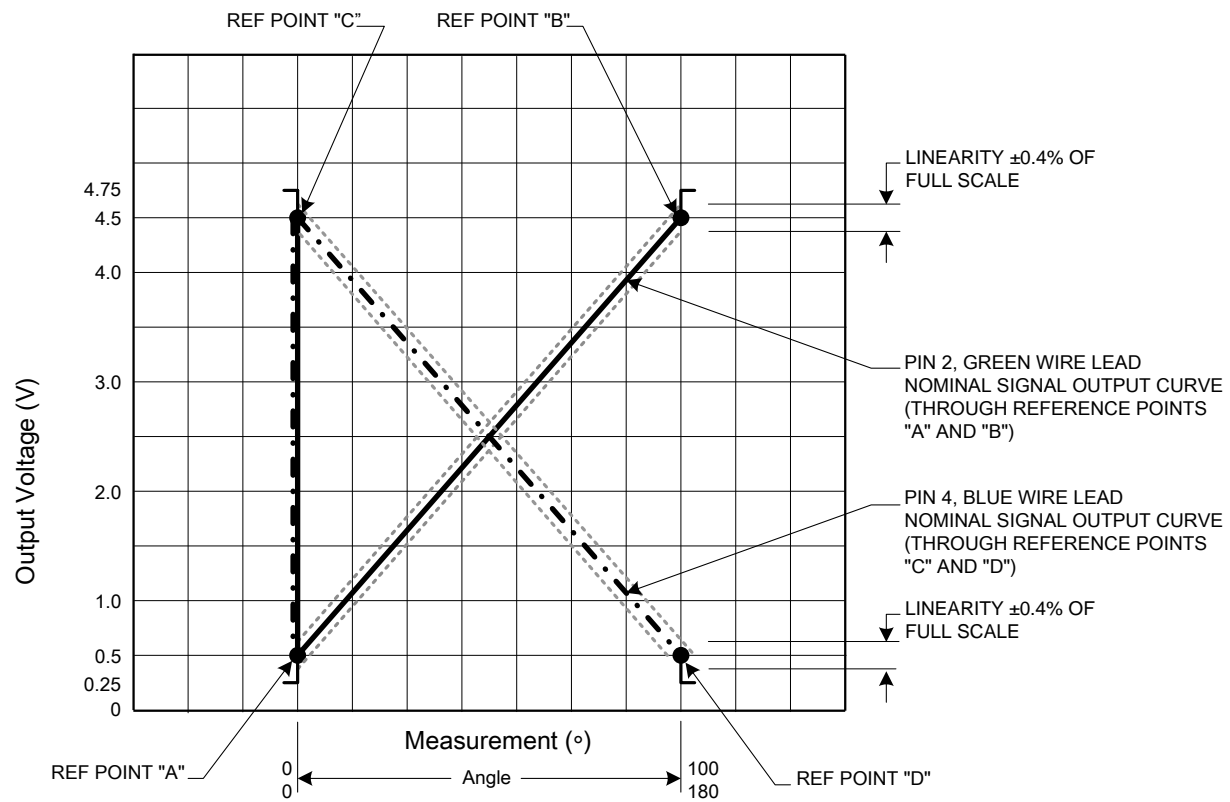


Figure 2. Connections

4 Pin M12 Connector	Ampseal 16 Connector (p/n 776536)	18 AWG Flying Leads
<b>SPS-A100D-HAMS, SPS-A100D-VAMS</b> <b>SPS-A180D-HAMS, SPS-A180D-VAMS</b>	<b>SPS-A100X-LAAS0401</b>	<b>SPS-A100D-HAWS</b>
Pin 1 = supply voltage (+) Pin 2 = output Pin 3 = ground (-) Pin 4 = inverted output	Pin 1 = supply voltage (+) Pin 2 = output Pin 3 = ground (-) Pin 4 = inverted output	Red wire = supply voltage (+) Green wire = output Black wire = ground (-) Blue wire = inverted output

# SMART Position Sensor

Figure 3. Sensor Output Performance Chart Showing Ideal Outputs (Applies to all catalog listings.)



**Note:** Diagnostic for magnet out of range: green wire lead > 4.55 Vdc; blue wire lead < 0.45 Vdc.

## Order Guide

Catalog Listing	Description
SPS-A100D-HAMS	SMART Position Sensor, 100° arc configuration, 0° to 100° inside sensing range, 6 Vdc to 24 Vdc supply voltage, 0.5 Vdc to 4.5 Vdc analog output, 4-pin M12 connector, magnet actuator included
SPS-A100D-VAMS	SMART Position Sensor, 100° arc configuration, 0° to 100° inside sensing range, 18 Vdc to 40 Vdc supply voltage, 0.5 Vdc to 4.5 Vdc analog output, 4-pin M12 connector, magnet actuator included
SPS-A100D-HAWS	SMART Position Sensor, 100° arc configuration, 0° to 100° inside sensing range, 6 Vdc to 24 Vdc supply voltage, 0.5 Vdc to 4.5 Vdc analog output, 18 AWG flying leads, magnet actuator included
SPS-A100X-LAAS0401	SMART Position Sensor, 100° arc configuration, 0° to 100° outside sensing range, 5 Vdc supply voltage, 0.5 Vdc to 4.5 Vdc analog output, Ampseal 16 connector (p/n 776536), magnet actuator included
SPS-A180D-HAMS	SMART Position Sensor, 180° arc configuration, 0° to 180° inside sensing range, 6 Vdc to 24 Vdc supply voltage, 0.5 Vdc to 4.5 Vdc analog output, 4-pin M12 connector, magnet actuator included
SPS-A180D-VAMS	SMART Position Sensor, 180° arc configuration, 0° to 180° inside sensing range, 18 Vdc to 40 Vdc supply voltage, 0.5 Vdc to 4.5 Vdc analog output, 4-pin M12 connector, magnet actuator included

### 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.**

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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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