

## AEROSPACE AND DEFENSE APPLICATIONS

## Application Note

# Honeywell Hawk™ Resolvers 1-Inch Series, Fully-Housed Configuration

### SOLUTION

Honeywell's Hawk™ 1-Inch Series Fully Housed Resolvers are durable, reliable, non-contact, absolute position sensors designed for use in potential defense and aerospace applications.

Figure 1. Hawk™ 1-Inch Series Fully Housed Resolvers



### VALUE PROPOSITIONS (★= competitive differentiator)

- ★ **Shock** specification of 50 g, 11 ms allows for use in harsh military and aerospace applications
- ★ **Vibration** specification of 15 g, 10 Hz to 2000 Hz allows for use in harsh military and aerospace applications
- ★ **Enhanced reliability and durability** when compared with potentiometers due to the Hawk™ Resolvers' ability to resolve an absolute angle using magnetic principles so that performance is not impacted by media (i.e., sand, dust, water), its ability to operate in many harsh environments, its non-contact design, the lack of electronics, and the use of space-qualified materials
- ★ **Operating temperature range** of -50.8 °C to 93.3 °C [-60 °F to 200 °F] allows for use in harsh environments and meets standard military and space application requirements
- ★ **Excitation voltage range** of 2 V to 15 V allows customers to standardize on a resolver that meets their excitation voltage needs, simplifying sourcing and delivery, and saving time
- ★ **Product delivery up to 1.5 times faster** than many competitive products due to Honeywell's use of the same components for all standard configurations of Hawk™ Resolvers, increasing production speed and reducing lead time. This results in Honeywell's ability to manufacture production-quality standard devices up to 1.5 times faster than many of its competitors (8 weeks vs. 20-22 weeks)

- ★ **Customization** due to Honeywell's manufacturing process and the variety of features that allow customers to customize Hawk™ Resolvers to meet their application accuracy/size requirements
- ★ **Global support** due to Honeywell's worldwide presence which offers customers immediate product and application support; many resolver competitors offer either support only in their local manufacturing area, or limited support outside of their manufacturing area
- ★ **Engineering expertise** due to Honeywell's 30+ years' experience providing accurate, reliable, and durable resolvers for the aerospace and defense industries

### FEATURES AND BENEFITS (in addition to value propositions)

- **Fully housed configuration** with bearing/shaft
- **Small outer diameter** of 1 inch allows for use in size-restricted applications
- **Single speed operation** (1 magnetic pole pair) allows for cost-effective angle resolution over a 360°+ range
- **Excitation frequency range** of 2000 Hz to 5000 Hz provides a wide variety of choices with which to power the device
- **Transformation ratio** of 0.45 or 1.0 offers customers two choices, increasing flexibility within the application
- **Accuracy** of ±7 arcmin enables precise motion control of weapon systems and space positioning devices
- **Non-contact magnetic technology** eliminates mechanical contact, reducing wear and improving reliability and durability by enhancing operation in harsh environments (performance is not affected by sand, dust or water)
- **Meets multiple military/aerospace specifications:** DO-160D, MIL-STD-202G, MIL-STD-810G, MIL-STD-81963B, MIL-STD-461F; complies with space outgassing requirement SP-R0022

### Options

- Custom trim designed to allow tighter accuracy (upon request)
- Connections include custom lead wire, cable, connector on unit or connector on cable
- Custom redundant brushless version (two independent resolvers within the same housing) to provide reliable back-up/fail-safe in critical applications
- Titanium housing provides enhanced durability and enhanced resistance to corrosion; lightweight
- Transformer for 360°+ rotation (continuous)

# Honeywell Hawk™ Resolvers

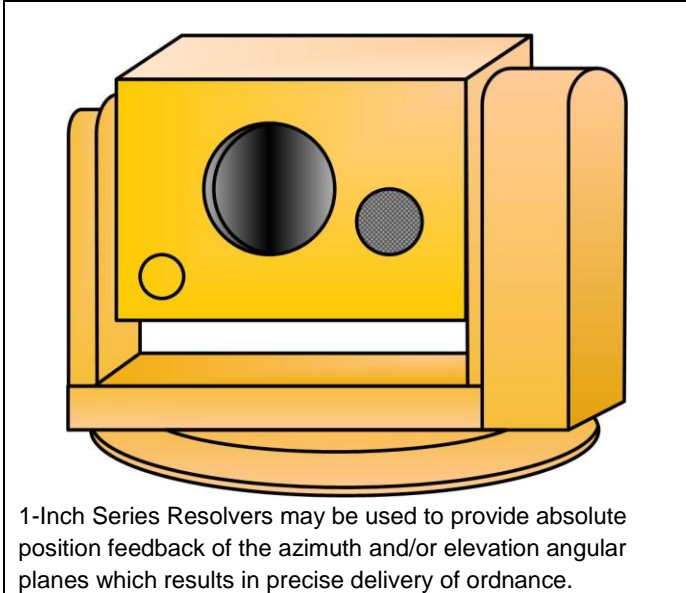
## 1-Inch Series, Fully-Housed Configuration

### POTENTIAL APPLICATIONS

Figures 2 through 7 show a variety of potential applications where the Hawk™ 1-Inch Series Resolvers may be used.

### DEFENSE

**Figure 2. Electro-Optical Systems (i.e., systems that transfer information from the optical system to the firing mechanism)**



**Figure 3. Fire Control Systems (i.e., weapon systems on military vehicles or vessels)**



**Figure 4. Gimbals Position Feedback (i.e., communication pedestals positioned on top of military vehicles)**

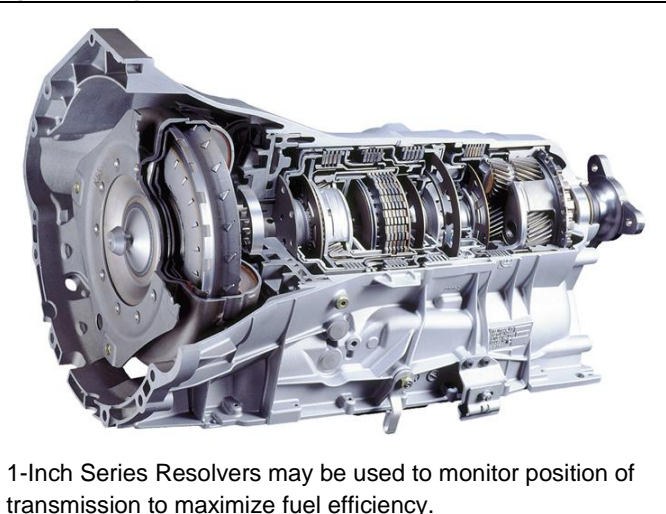


1-Inch Series Resolvers may be used to provide absolute position feedback of the azimuth and/or elevation angular planes which results in continuous communication stream.

**Infrared Systems (i.e., military vehicle infrared systems)**

1-Inch Series Resolvers may be used to accurately aim the infrared system at the target.

**Figure 5. Engines/Transmissions**



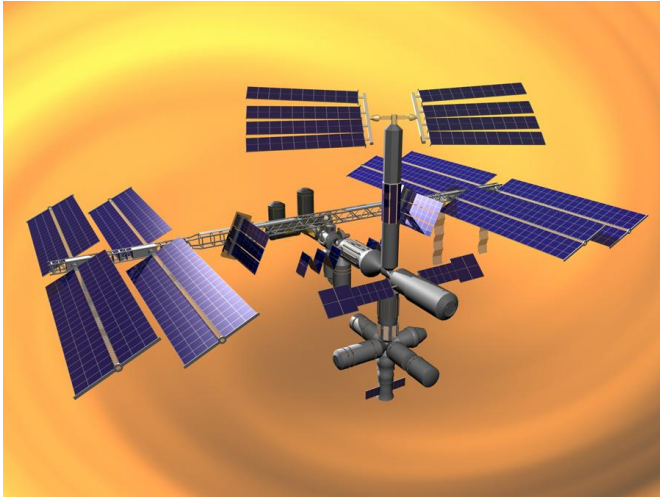
**Test Equipment**

1-Inch Series Resolvers may be used for absolute position feedback to test optical/magnetic encoders, potentiometers and related position sensors.

# Honeywell Hawk™ Resolvers 1-Inch Series, Fully-Housed Configuration

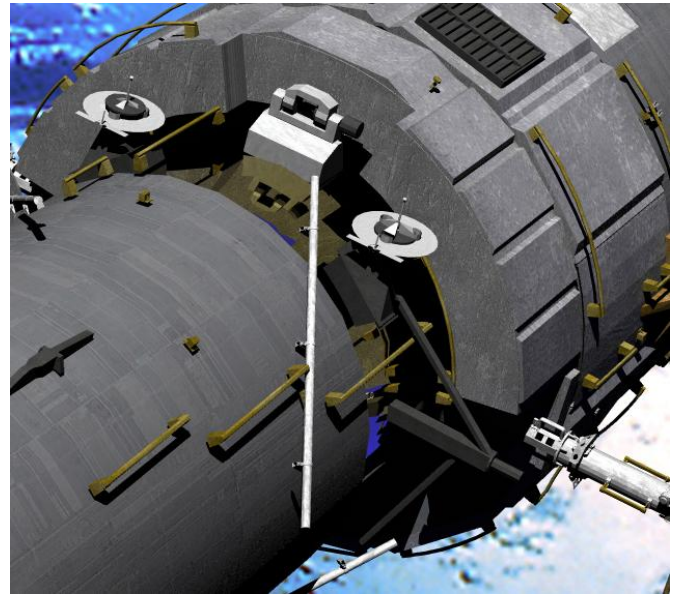
## SPACE

Figure 6. Satellite, Space Station or Space Vehicle Solar Panel Array



1-Inch Series Resolvers may be used to position the equipment for maximum solar energy extrusion.

Figure 7. Satellite Antenna



1-Inch Series Resolvers may be used to position the satellite antenna for signal transmission.

### **⚠ 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.**

#### **SALES AND SERVICE**

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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