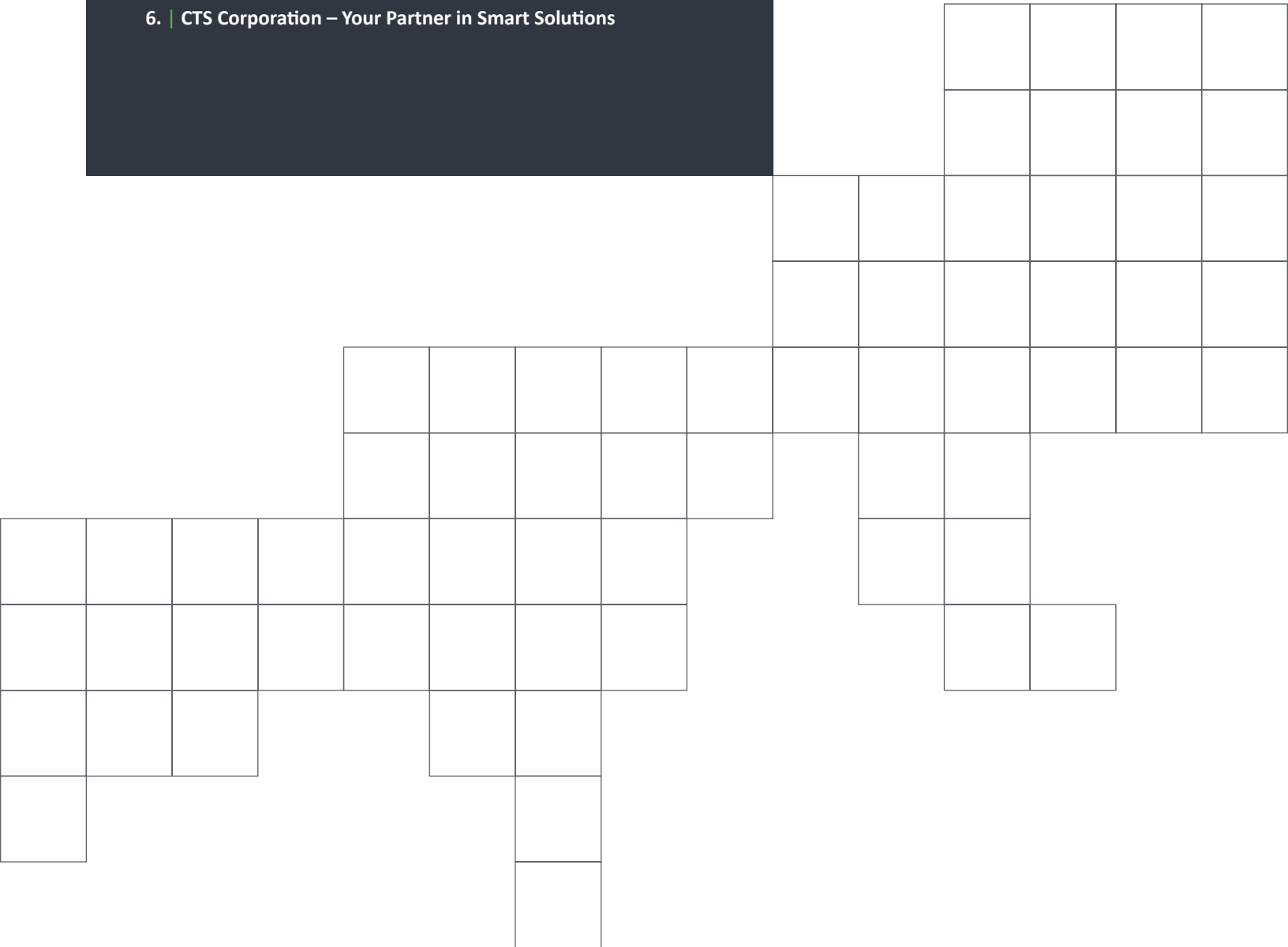




Series 285 Non-Contacting Rotary Position Sensor Product Brochure

Contents

- 3. | CTS Series 285 Rotary Position Sensors
- 3. | Hall-Effect Technology
- 4. | Advantages of Hall-Effect Technology
- 4. | Series 285 Key Specifications
- 5. | Series 285 Custom & Value-Added Capabilities
- 5. | Series 285 Features And Benefits
- 6. | Series 285 Typical Industrial Applications
- 6. | CTS Corporation – Your Partner in Smart Solutions



SERIES 285 NON-CONTACTING ROTARY POSITION SENSOR PRODUCT BROCHURE

Rotary position sensors are electro-mechanical devices used to measure the displacement and position of an object. They measure angles of rotation by providing feedback in the form of voltage or other types of output signals. These measuring devices can be constructed with contacting or non-contacting technologies.

CTS non-contacting Hall-effect rotary position sensors are designed for the most demanding applications in the industrial, medical, and transportation markets.

Drawing from over 20 years of experience in non-contacting solutions for automotive applications, CTS has refined this technology for use in the industrial-grade Series 285 family of rotary position sensors.

CTS SERIES 285 ROTARY POSITION SENSORS

Quality, reliability, and longevity are all core characteristics of the Series 285 family of non-contacting rotary position sensors.

Series 285 rotary position sensors utilize Hall-effect technology to eliminate the internal wear of contacting parts, allowing for extended field deployment.

Sleeve-bearing and ball-bearing options provide different levels of rotational life suited to the needs of the specific application. Precision linearity and low hysteresis allow for consistent position and precise position sensing.

The wide operating temperature range and numerous seal options make this product suitable for applications in extreme heat or cold as well as dusty or wet environments.

HALL-EFFECT TECHNOLOGY

Hall-effect technology offers a reliable and high-quality solution where contacting technology falls short.

Discovered by Edwin Hall in 1879, Hall-effect refers to the potential difference on opposite sides of a bar-shaped conducting or semi-conducting material (Hall element).

This potential difference (voltage) is produced by a magnetic field applied perpendicular to the Hall element, through which electric current flows. Figure 1 is provided to illustrate this concept.

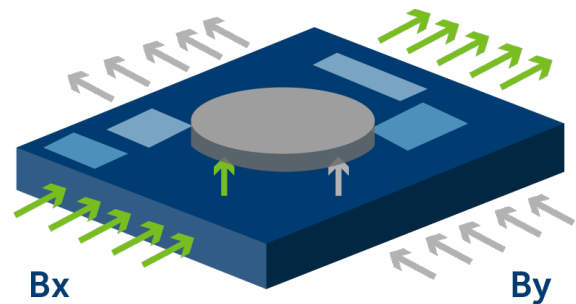


Figure 1: Hall Concept

Hall-effect technology produces an analog output similar to contacting potentiometers without the aid of a physical wiper contact. There are no internal contacting parts subject to mechanical wear or failure, making this technology ideal for use in harsh environments where extreme levels of shock, vibration, temperature changes, moisture and dust particles are present.

Figure 2 demonstrates the typical configuration for the Hall-effect sensor where a magnet is rotated over a pre-programmed integrated circuit (IC), thereby producing an analog signal output.

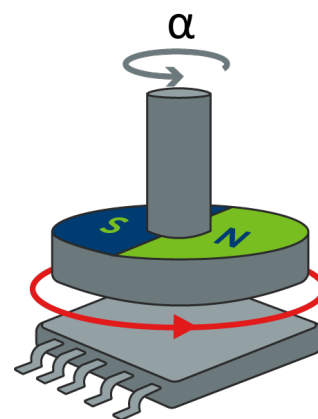


Figure 2: Hall Configuration

ADVANTAGES OF HALL-EFFECT TECHNOLOGY

Hall-effect technology is non-contacting, meaning, there are no internal contacting parts required to produce the output signal. As a result, it offers enhanced reliability and durability in harsh environmental conditions such as dirt, grease, oil, water and other fluids, providing a technological advantage in performance over contacting technologies.

The expected cycle life is more than 50 times the expectancy of traditional rotary position sensors with contacting technology. In addition, there is no need for periodic calibration of non-contacting rotary position sensors, since the output remains constant over the life of the product. Periodic calibration is required for contacting rotary position sensors, because the output degrades over time.

Hall-effect technology performs well under constant shock and vibration conditions, unlike contacting technology which degrades quickly under constant vibration.

This technology also greatly reduces the need for maintenance and service replacement, translating to cost savings in the long run. This is especially important in applications with equipment located in remote areas that are costly to service. Reducing the frequency of changing rotary position sensors also reduces equipment downtime and increases efficiency.

Mechanical engineers who design the Series 285 rotary position sensor into end products can expect extended cycle life and superior performance, without degradation of output accuracy over products with contacting technology.

SERIES 285 KEY SPECIFICATIONS

There are multiple options that make Series 285 suitable for a variety of applications. Key specifications are listed in Table 1 at the bottom of the page.

The graph in Figure 3 shows two typical analog outputs provided by the Series 285 family of products. Output can be factory programmed to meet the full electrical angle output, or any variation thereof (i.e., 0° to 20°, 0° to 45°, 0° to 180°, etc.)

Similarly, the voltage ratio can be factory programmed to meet 0% to 100% VDD, or any variation thereof (i.e. 5%-95% of VDD, 10%-90% of VDD, etc.) Output A in Figure 3 shows 1% to 100% of the input voltage, while Output B shows 1% to 50% of the input voltage.

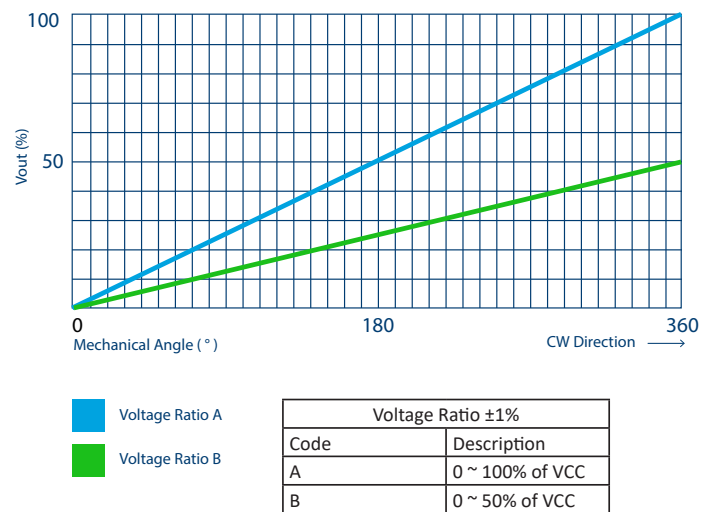


Figure 3: Hall Configuration

Series	Photo	Operating Voltage Options	Output	Rotational Life	IP rating Options	Effective Electrical Angle Options	Operating Temperature Range	Linearity Options	End Stop Options
285C		5.0 VDC 3.3 VDC	Analog	Sleeve Bearing: 10M cycles	50 54 67	260° 310° 360°	-40° to +125°C	±0.5% ±0.25%	270 ° 320 °
285S 285N		5.0 VDC 3.3 VDC	Analog	Sleeve Bearing: 10M cycles	50 54 67	125° 260° 310° 360°	-40° to +125°C	±0.5% ±0.25%	200 ° 270 ° 320 °

Table 1: Key Specifications

SERIES 285 CUSTOM & VALUE-ADDED CAPABILITIES

A broad range of standard configurations are available, along with custom engineered solutions to meet specific applications. Some custom and value-added capabilities of the Series 285 family of rotary position sensors include:

- Electrical and mechanical angle modifications
- Shaft and bushing customization
- Optional output communication protocols (such as PWM, SSI, SPI and CAN bus)
- Dual independent or redundant output
- Cable and connector customization Linearity
- Custom packaging as required for specific applications.

For additional information on modifications and customization, please contact us here:
<https://www.ctscorp.com/contact/sample-request/>

Features	Benefits
<p>Non-contacting Hall-effect technology enables Series 285 to endure 10 million cycles of rotational life, providing durability and extended application deployment.</p>	 <p>Elimination of wearing electrical contacting parts. Extended field deployment.</p>
<p>Precision linearity of $\pm 0.25\%$ and hysteresis of 0.2% enable precision position sensing in applications where precision measurements are required.</p>	 <p>Allows for precise position sensing.</p>
<p>Series 285 non-contacting rotary position sensor products deliver high performance over an impressive temperature range of -40°C to $+125^{\circ}\text{C}$, making it well-suited for applications that require accurate position sensing in various temperature settings.</p>	 <p>Suitable for use in cold and hot environments</p>
<p>Available IP seal options enable Series 285 products to be used in a variety of harsh conditions, including dusty and wet environments.</p>	 <p>Suitable for use in dusty or wet environments.</p>
<p>Offered with standard 5.0 and 3.0 VDC powering options, Series 285 is can be used in both standard and energy-efficient applications. Battery-operated end applications will greatly benefit from the low power option.</p>	 <p>Power supply flexibility.</p>
<p>Standard internal EMI shielding provided in the design enables usage of Series 285 in proximity to components emitting electromagnetic fields, including motors.</p>	 <p>Protection against EMI.</p>

SERIES 285 TYPICAL INDUSTRIAL APPLICATIONS

Industrial

- Wheel balancing equipment
- Flow valves
- Pneumatic control valves
- Draw wire position sensors
- Riding mower
- Portable generators
- Valve controllers and actuators
- Food & beverage processing
- Automated assembly & packaging
- Robotics



Medical

- Diagnostic equipment
- Emergency & patient monitor
- Medication management
- Patient platform
- Dental chair
- Mobility equipment



Transportation

- Cycle/Scooters
- Agriculture equipment
- Construction equipment
- Material handling – forklifts and lift trucks
- Light rail – door opening sensors
- Marine – throttle controls and ship propulsion
- Train seat positioning
- 1st class airplane seats



Off-Road Vehicles

- Throttle position sensors
- Throttle for EFI
- Riding lawn mowers
- Mining machinery

CTS CORPORATION – YOUR PARTNER IN SMART SOLUTIONS

We've been part of the future for 120 years

Founded in 1896, CTS Corporation (NYSE: CTS) is a leading designer and manufacturer of products that Sense, Connect, and Move.

CTS manufactures sensors, actuators, and electronic components in North America, Europe, and Asia. They provide solutions to OEMs in the aerospace, communications, defense, industrial, information technology, medical, and transportation markets.

CTS focuses on providing advanced technology, exceptional customer service, and superior value to industry partners throughout the globe.

They aim to be at the forefront of technology, delivering innovative sensing, connectivity and motion solutions for the creation and advancement of products and services around the world.

Contact

CTS Corporation
4925 Indiana Avenue
Lisle, IL 60532

Web: www.ctscorp.com

<https://www.ctscorp.com/contact/sample-request/>

Technical Contact:

Chuck Manzano
Sr. Product Manager

E-mail: sensorscontrols@ctscorp.com

Tel: +1 (630) 577-8800

Media Relations Contact:

Jackie Morris
Marketing & Communications Manager

E-mail: mediarelations@ctscorp.com

Tel: +1 (630) 577-8865

