

Series 286

Multi-Turn Non-Contacting
Hall Effect Position Sensor

November 2022

Multi-Turn vs Single Turn

What is it?

- A type of encoder or position sensor that operates beyond the 360 degrees of a single turn version.
- Common configurations include 3-, 5- and 10-turn types.
- A multi-turn can track changes in position as high as 3600 degrees, for extended range
- Tracks total revolutions of a device, such as a motor or a wheel
- Provides longer reach and greater range in linear applications

CTS position sensors:

- Multi-turn Series 286
- Low-cost Single-turn Series 285

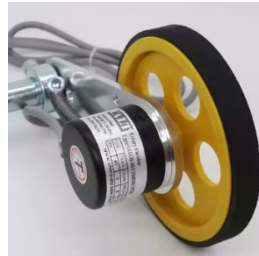


Series 286 vs 285

Series 286	Series 285
<ul style="list-style-type: none">• Multi-turn: 3, 5 or 10	<ul style="list-style-type: none">• Single turn
<ul style="list-style-type: none">• 3600 degree angle	<ul style="list-style-type: none">• 360 degree angle
<ul style="list-style-type: none">• Single and dual output types	<ul style="list-style-type: none">• Single output
<ul style="list-style-type: none">• High performance	<ul style="list-style-type: none">• Low-cost solution

Example Uses

- Conveyors, string pots
- Actuators
- Servo motors
- Valves
- Forklift masts, steering
- Telehandlers, cherry-pickers
- Packaging machines
- Patient platforms



Rotary applications



Linear applications



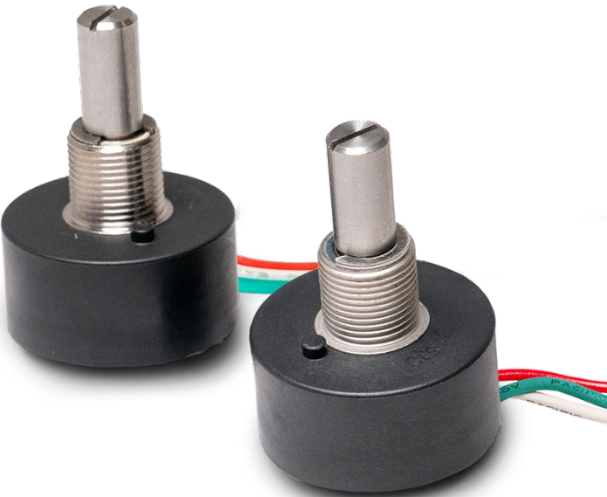
Series 286



Series 285

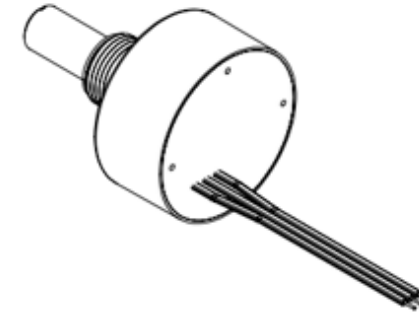
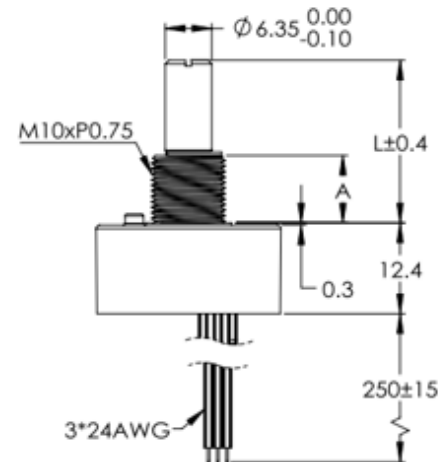
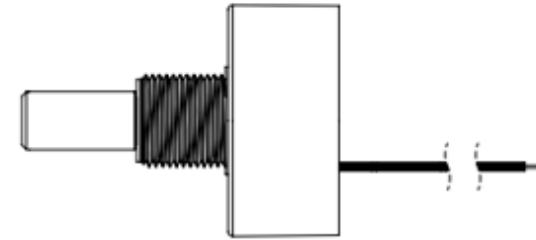
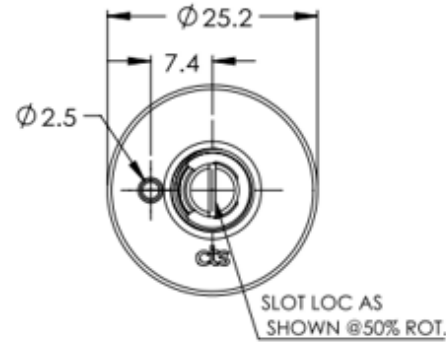
Series 286 – Features & Benefits

Features	Benefits
Up to 10 turns with 3600°	Provides higher range of positional data
Non-contacting Hall Effect technology	No physical contacts to wear out
10M cycles of rotational life	Extended field deployment
Precision linearity & hysteresis	Allows precise position sensing
Wide operating temperature range	Suitable for use in cold or hot environments
IP67 rated	Impervious to dust and moisture
Internal shielding standard	Protection against EMI



Series 286 - Product Overview

- Up to 10 turns, 3600°, with 12-bit resolution
- Hall-Effect technology: no contacts
- Single- and dual-output
- High rotational life: 10M cycles
- Precise linearity $\pm 0.5\%$
- Hysteresis: 0.2%
- Compact 25mm \varnothing size
- Wide operating temperature range: -40°C to +125°C
- Seal: IP67



Hall Effect Technology

- Discovered by Edwin Hall in 1879
- Magnet rotates in close proximity to the Hall element
- The rotation of the magnet causes a difference in potential in the Hall element
- The potential difference (voltage) is produced, through which electric current flows
- No mechanical contacting parts to wear out
- Output remains consistent throughout the life of the product

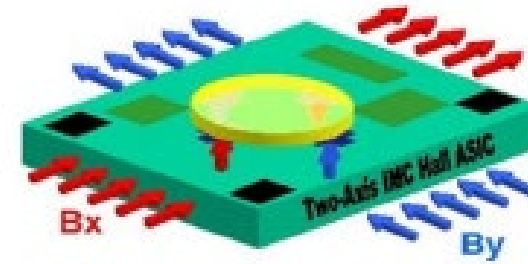


Figure 1: Hall Concept

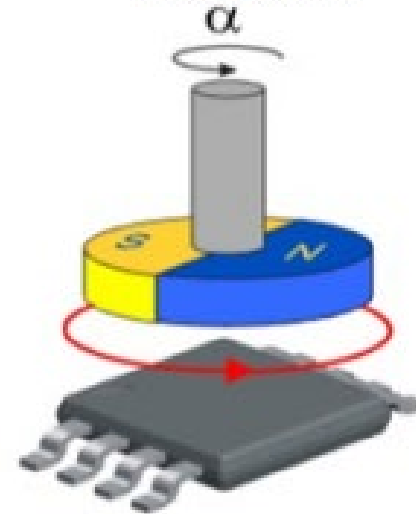


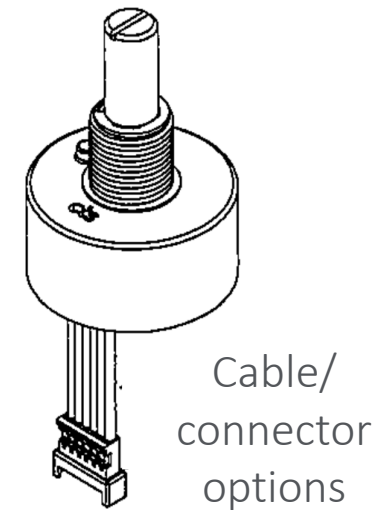
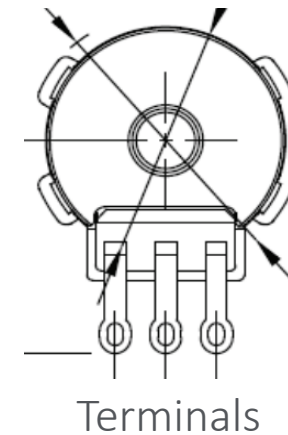
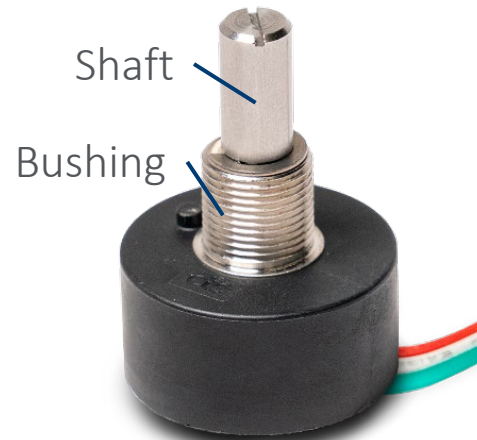
Figure 2: Typical Hall Configuration

Series 286 – Custom and Value-Added Capabilities




The Series 286 Multi-Turn Rotary Position Sensor provides reliable extended range results in a small package, with a competitive price and flexibility for future ideas.

Custom and Value-added options and capabilities

- Bushing length and diameter
- Terminal types
- Shaft diameter & length
- Cable/connector customization
- Special mounting details
- Custom electromechanical assemblies



Series 286 – Markets and Applications

Market	Submarket	DTAM (US\$M)	Application Examples
Industrial	Process automation	\$100M	
	Material handling	\$190M	
	Valve control	\$98.5	
Medical	Portable ultrasound	\$43.75	
	Patient mobility	\$68M	
	CPAP	\$9.1M	
Transportation	2-wheel throttle	\$50M	
	3- and 4-wheel offroad	\$175M	
	Agriculture vehicle	\$73.75M	

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