

ERG Drives

Electromechanical Rotary Gear Drives

**CURTISS-
WRIGHT**

CURTISSWRIGHTDS.COM



Key Features

- Modularly designed planetary gearbox allowing different ratios and spur gear while maximizing stiffness and minimizing friction and backlash
- Brushless AC servo motor with high resolution motor feedback
- Electromagnetic spring-loaded brake including clutch functionality to overcome overload
- No-back element to prevent rotation of manual input shaft
- Manual backup
- Multiple mechanical load interfaces
- Fully configurable
- Qualified to MIL-STD (EQT & EMC)

Applications

- Remote Weapon Stations (RWS)
- Ammunition Handling Systems (AHS)
- Turret Drive Servo Systems (TDSS)
- Applications requiring stabilization and control in harsh environments

Overview

Curtiss-Wright's line of [Electrical Rotary Gear \(ERG\) drives](#) are responsible for the transmission of rotary movements for traverse or elevation drives. They are a critical component in the traverse and elevation of aiming and stabilization systems, accurately transferring the motor's motion, both while aiming at constant low speeds and in stabilize mode, and in controlling highly dynamic movements.

Highly engineered, rugged, and reliable, the ERG line of drives is designed for operation in the harshest locations and in the most severe conditions. A part of our modular suite of rugged and field-proven components, they are fully configurable and can be tailored to meet the unique needs of your application.

The ERG drive assembly consists of:

- Planetary gearbox
- Spur gear
- Clutch/Brake/No-back combination with manual input shaft
- AC servo motor with integrated absolute motor feedback
- Load interface

The planetary gearbox is designed to perform reliably and accurately in applications operating in harsh environments, including, heavy loads, continuous vibrations, and high shock. Available in one and two stage designs with different gear ratios. The gearbox is designed to maximize stiffness and minimize friction and backlash.

Coupling of the spur gear to the input shaft of the gearbox allows for a second interface, typically a brake/clutch/no-back combination. This configuration increases brake torque and decreases manual input torque.

A clutch/brake/no-back combination with manual input shaft adds different capabilities to the drive. The clutch provides a configurable torque to ensure, if an overload occurs, there isn't any damage to the drive or application. The brake is used to hold, stop movement of, the application. For safe use, it is opened by an electromagnet and closed with spring force when not electrically enabled. The no-back ensures that motion is not transferred to the manual input shaft and that operators cannot be hurt by the moving hand crank. Manual input shaft is included.

The ERG line of actuators uses a brushless AC servo motor with an integrated high resolution, multiturn, absolute motor feedback sensor. The motor feedback sensor acts as a commutator and records the position of the motor. The motor is designed with the latest servo technologies and uses rare earth magnets. Connector orientation is highly flexible.

The design of the load interface is configurable, based on the needs of the application, e.g. as single pinion, split pinion, or gearhead. The simplest configuration is the single pinion, it does not contain any backlash compensation. Split pinion incorporates a spring that allows for the compensation of backlash up to a certain torque. The gearhead is a design with dual output pinions, a higher capacity of backlash compensation and highly sophisticated configurations for the adaption of pinions to a ring gear.

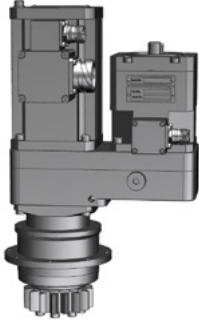
Technical Specifications

TABLE 1 ERG Drives Ordering Information

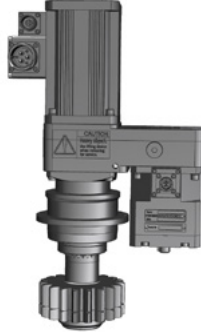
		ERG100L	ERG400N	ERG800	ERG1500N
QUALIFICATION	MIL-STD-1275 (Power Supply)	18 to 32 V DC			
	MIL-STD-461 (EMI/EMC)	✓			
	MIL-STD-810 (Environmental)	✓			
	MTBF (MIL-HDBK-217 FN2, NPRD-2016)	on request			
	Operating Temperature (MIL-STD-810)	-40 to 143.6 °F (-40 to +62 °C)			
MECHANICAL INTERFACES	Hirth serration	✓	✓	✓	✓
	Single pinion	✓	✓	✓	✓
	Split pinion	✓	✓		
	Gearhead		✓	✓	✓
FEATURES	Typical azimuth drive turret size	~3,300 lbs (1,500 kg)	~12,000 lbs (5,500 kg)	~17,000 lbs (8,000 kg)	~44,000 lbs (20,000 kg)
	Typical elevation drive weapon caliber	20 mm	90 mm	105 mm	120 mm
	Nominal output torque	100 Nm	400 Nm	800 Nm	1,500 Nm
	Emergency stop torque	200 Nm	800 Nm	1,600 Nm	3,000 Nm
	Gear ratio	17:1 to 91:1	16:1 to 64:1	16:1 to 64:1	16:1 to 64:1
	Stiffness	> 60 kNm/rad	> 200 kNm/rad	> 360 kNm/rad	> 600 kNm/rad
	Gearbox backlash	< 6 arcmin	< 6 arcmin	< 5 arcmin	< 5 arcmin
	Motor output peak torque (up to)	7 Nm	27 Nm	44 Nm	54 Nm
	Motor output speed (up to)	4,000 rpm	3,200 rpm	2,260 rpm	2,000 rpm
	Clutch/Brake torque	13 Nm	25 Nm	55 Nm	55 Nm
	Weight	~ 35 lbs (~ 16 kg)	~77 lbs (~ 35 kg)	~ 176 lbs (~ 80 kg)	~ 276 lbs (~ 125 kg)
	Dimensions	~ 13.23 x 8.31 x 4.65" (~ 336 x 211 x 118 mm) With single pinion	~ 19.57 x 10.16 x 5.71" (~ 497 x 258 x 145 mm) With split pinion	~ 23.19 x 16.34 x 7.76" (~ 589 x 415 x 197 mm) With gearhead	~ 25.63 x 20.67 x 12.2" (~ 651 x 525 x 310 mm) With gearhead
	Additional options	<ul style="list-style-type: none"> › Higher voltage motors (e.g. 300 V DC bus) › Highly configurable to meet integration and/or performance needs › Manual drive assemblies including hand crank and bevel gearboxes › Design and support for bracket and installation 			
Remark	Specifications valid for already configured drives. Example drawings and step files of existing configurations available upon request.				

Product Configuration Examples

ERG100L

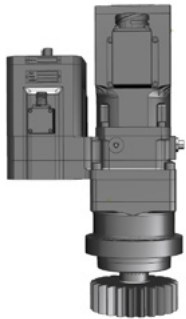


Elevation drive (with single pinion)



Azimuth drive (with split pinion)

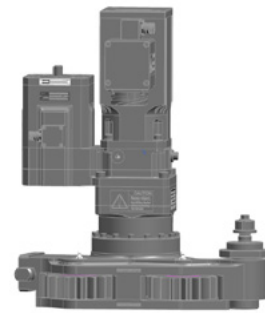
ERG400N



Elevation drive (with single pinion)

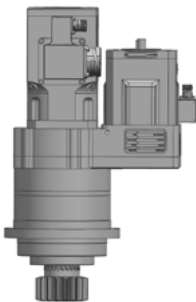


Azimuth drive (with split pinion)

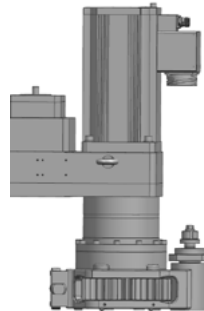


Azimuth drive (with gearhead)

ERG800



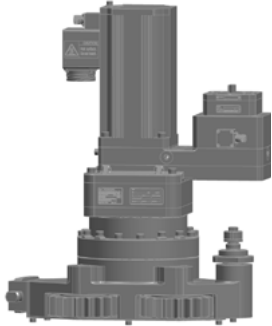
Elevation drive (with single pinion)



Azimuth drive (with gearhead)

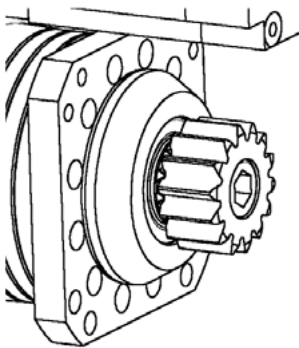
Product Configuration Examples

ERG1500N

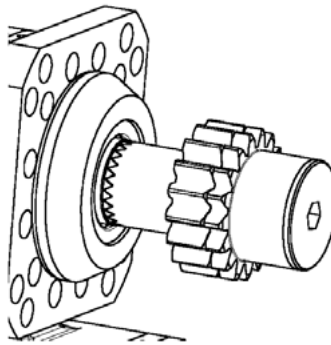


Azimuth drive (with gearhead)

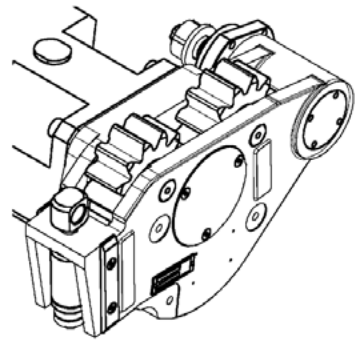
Mechanical Interfaces



Single pinion

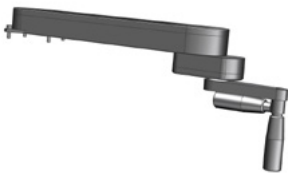


Split pinion



Gearhead

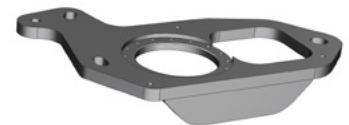
Options



Manual drive assembly with hand crank



Bevel gearbox for manual input



Bracket for adaption and fixation of drive

Ordering Information

Contact [Curtiss-Wright](https://www.curtisswright.com) for ordering information.