Rhinestahl CTS

FutureDrive NG+

FAST, ACCURATE, AND EFFICIENT ELECTRONIC TURNING OF GAS TURBINE ENGINES

The Leading Electronic Turning Tool in the Industry

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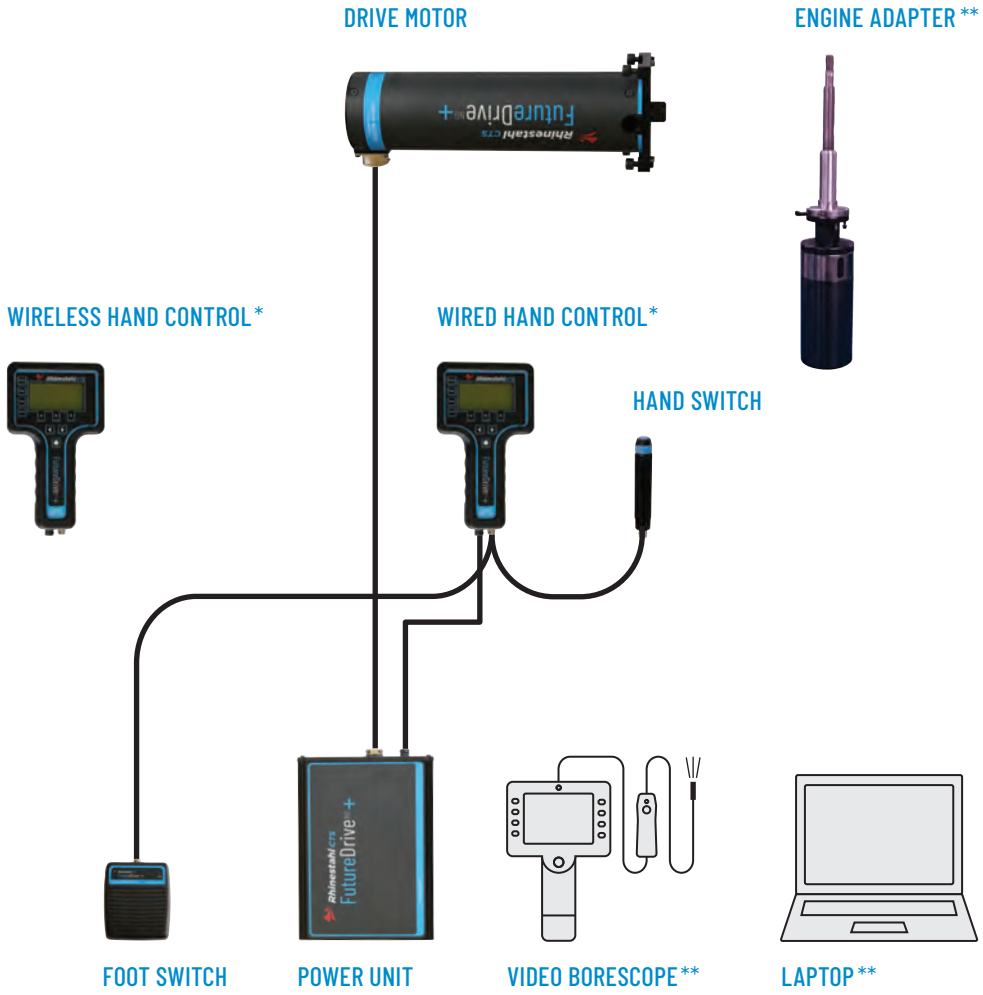
FutureDrive NG+

YOUR PRECISION ELECTRONIC TURNING SOLUTION

Introducing the FutureDriveNG+, an electronic turning tool that automates the gas turbine engine borescope inspection process by reducing manpower and hours, while providing a fast, accurate, and efficient assessment of engine condition. The FutureDriveNG+ is the same system that you are used to but with new and improved features to make your job easier.

With top-of-the-line safety features, you can now perform your job safely and automatically. OEM tested and certified, this system can be fully tailored to your specific application needs. Wherever you are, you can count on the FutureDriveNG+.



*The system includes a wired or wireless hand control selected by the customer at order placement.

**The engine adapter, laptop, and video borescope are not included in the FutureDriveNG+ system.

PRODUCT OVERVIEW

BASE KIT INCLUDES:

- Wireless or Wired Capability
- Drive Motor
- Power Unit
- Carry Case
- Connecting Cables
- Hand Control
- Foot Switch
- Hand Switch
- Video Overlay

ADDITIONAL OPTIONS:

- Engine adapter and pre-programmed engine software to connect FutureDriveNG+ to your specific engine applications (see list of engines supported).

DRIVE MOTOR

Used with the proper adapter, the drive motor precisely rotates the Intermediate Pressure Rotor or the High-Pressure Rotor respectively, with digitally controlled, high-torque motor and gearbox for unparalleled accuracy.

FOOT & HAND SWITCH

Rotate the engine and flag damaged blades to perform a completely hands-free inspection. Hang your hand control on the engine for easy viewing, rotate your engine, and flag damaged blades with the push of a button.

POWER UNIT

The hub of the FutureDriveNG+ system. Connect a video borescope and monitor display via composite video or S-video inputs. Produces clear video overlay information to your monitor. Built-in USB port allows for quick software upgrades.

WIRELESS & WIRED HAND CONTROL

Large backlit LCD screen displays engine information and blade number. Select operating modes and conduct your entire inspection from the hand control, or connect the hand switch or foot pedal to accommodate your inspection needs. This new system allows easier access for battery replacement.

CARRY CASE

Rugged and portable with wheels. Take the FutureDriveNG+ system anywhere and operate right out of the case.

FOR MORE INFORMATION VISIT
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FutureDrive NG+

Designed and built by Rhinestahl, manufacturers of turbine engine tooling and components for engine maintenance, repair, and overhaul support since 1967.

OPTIMIZE YOUR ELECTRONIC TURNING INSPECTION PROCESS

LESS PEOPLE, LESS TIME

The FutureDriveNG+ allows borescope inspections to be accomplished by a single technician, reducing shop costs and labor inspection hours by over 50%.

LESS EFFORT

The FutureDriveNG+ is easy to use and can be set up in minutes. Simply connect the cables, attach the motor, plug it in, and go. Use an automated, hands-free inspection method, or choose to rotate the engine one blade at a time. Its upgraded motor encoder allows for better resolution and accurate turning.

ACCURACY

Stop at any blade, return to any blade. The FutureDriveNG+ allows inspectors to turn bi-directionally, if applicable, easily flag damaged blades, and store the location to allow them to return to any blade with just the push of a button. Inspectors can now continuously turn in both directions, CW and CCW, up to 999 turns.

PORTABILITY

The FutureDriveNG+ comes in a rugged, portable carrying case with wheels that contains everything you need to rotate the engine. This case allows the inclusion of an offset adapter and up to 3 total engine adapters*. The self-seeking power supply works on worldwide power systems.

EXPANDABLE

The FutureDriveNG+ is an OEM source data solution for a wide range of Rolls-Royce, GE, and CFM engines with Pratt and Whitney options also available. Software updates for your fleet's new engines can easily be field updated in less than 15 minutes.

FLEXIBILITY

The FutureDriveNG+ offers the choice of a wireless or wired capability to accommodate the requirements of each customer. Both options offer the same performance and capabilities.

*adapters and software are not included in base kit

SYSTEM HIGHLIGHTS & SUPPORTED ENGINES

SYSTEM HIGHLIGHTS

Motor Encoder
Upgraded for better resolution and accurate turning.

Hand Control Housing
Easier access to battery pack.

Bi-Directional Continuous Turn
Clockwise and counterclockwise up to 999 turns.

Bi-Directional Incremental Turn
Clockwise and counterclockwise blade to blade motion with user selected dwell time.

Dwell Time
Increased to 99 seconds for incremental turning.

Backlash Dynamic Position Control
Motor will maintain current position to overcome angular momentum until next command is sent from the hand control.

Serialization Capable Wireless Chip
Upgraded to be more robust and capable.

Battery Pack
Upgraded to extended life cycle.

Automatic Serial Number Verification
Prevents software update errors.

Communication Capability
Allows FutureDriveNG+ turning tool / MviQ Borescope communication.

Resequencing Feature
Automatically moves most used engine software to appear first on engine list in the hand control.

Modified Pelican™ Case
Allows inclusion of an offset adapter and up to 3 engine adapters depending on size.

SUPPORTED ENGINES*

The FutureDriveNG+ supports the following engines with an added adapter:

CFM56-5B	GP7200	GEnx-1B	LEAP-1A
CFM56-5C	P20	GEnx-2B	LEAP-1B
CFM56-7B	TRENT XWB	GE9X	LEAP-1C
CFM56-7BE	TRENT 7000	LM2500-M&I CF6-6	AE2100D3
CF34-10A	TRENT 1000	LM6000-M&I CF6-80C2	
CF34-10E	TRENT 900	LMS100	

*Please contact sales@rhinestahl.com if you do not see your engine listed.

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SAFETY FEATURES

Built-in safety support system to protect your engine and turning tool.

PROVEN SAFETY SYSTEM TO PROTECT YOUR JET ENGINE

- FutureDriveNG+ uses torque limits provided directly by the Jet Engine OEM to prevent out of limits torque inputs.
- FutureDriveNG+ includes a shear pin with a mechanical torque limit designed to break if the system reaches 95ft-lbs.
- FutureDriveNG+ uses some adapters, developed jointly with the Jet Engine OEM, that include a slip clutch (torque limiter) as an additional safety feature to protect the jet engine from being over torqued.

BUILT-IN SAFETY SYSTEM TO PROTECT YOUR TURNING TOOL

- FutureDriveNG+ includes a fuse and filter design to protect power unit from power surge.
- FutureDriveNG+'s motor and hand control cables include a trim trio connector and locking mechanism to ensure proper and secure connection.
- FutureDriveNG+'s Hand control includes a neoprene boot to protect hand control assembly during operation.
- FutureDriveNG+ includes a rugged Pelican™ Storm case for protection.

TECHNICAL SPECIFICATIONS

Physical Size	
Entire Package	31.3" x 20.4" x 12.20"
Power Unit	6.75" x 2" x 9" (17.15 x 5.08 x 22.86 cm)
Drive Motor	3.25" x 2.5" x 10" (8.26 x 6.35 x 25.4 cm)
Hand Controller	2" x 5" x 8.75" (5.08 x 12.70 x 22.23 cm)
Aux. Hand Switch	0.75" diameter x 5" (1.91 cm diameter x 12.70 cm)
Aux. Foot Switch	2" x 3.5" x 5.5" (5.08 x 8.89 x 13.97 cm)
Weight	
Entire Package	39.2 lb (17.8 kg), including case, cables, and all accessories
Main Power Unit	4 lb (1.85 kg)
Drive Motor	5 lb (2.27 kg)
Hand Controller	1 lb (0.45 kg)
Electrical Requirements	
Voltage	100-240 VAC, 2A
Hertz	47-63 Hz
Fuse	5 mm x 20 mm Glass Tube Fast-Acting, 250 VAC, 2A
Environmental	
Operating Temperature	-10 °C to 50 °C (14 °F to 122 °F)
Storage Temperature	-10 °C to 70 °C (14 °F to 158 °F)
Humidity	0 to 96%
Operation	
Speed	Variable from 0.01 up to 2 RPM of the engine core
Direction	Bi-directional
Torque	Drive Motor rated at 120 ft-lb (162.70 Nm)/ shear pin rated to 90 ft-lb (122.02 Nm) (5 total pins included in case of needed replacement)
Internal Timer	0 to 99 seconds between blades
Blade Counter	Up to 999
Blade Flagging	Damaged blade locations can be flagged and automatically repositioned
Control Type	Simple multiplexing one-hand control design with emphasis on simple operation without sacrificing full functional versatility. Backlit LCD display provides for maximum visibility in a wide variety of operating.
Hand Control Battery	NiMH 9.6V
Power Electronics	Microprocessor based system design ensures reliable operation
Drive Motor	DC brushless servo motor design with a machined, aircraft-aluminum housing, and high-resolution encoder feedback for full motion control range with digital accuracy. High-torque gearbox ensures reliable operation. Variable acceleration design provides for minimal backlash problems during operation.

For latest configurations and part numbers, please contact Rhinestahl Sales and Support.

Rhinestahl CTS
Customer Tooling Solutions

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