



IGNITION SYSTEMS

FOR HIGH- OR MEDIUM-SPEED INDUSTRIAL
SPARK-IGNITED GAS ENGINES

IGNITION SYSTEMS

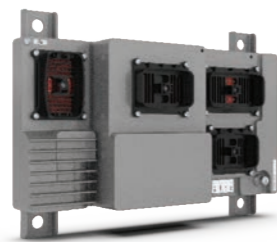


Woodward offers a complete ignition system for use with spark-ignited gas engines. Woodward's technology is constantly pushing the limits on maintenance intervals through improved designs and material selections in spark plugs, ignition coils, leads and extenders. The dynamic energy management capability of the EID ignition driver further maximizes plug life through optimal energy delivery.

Woodward offers a customizable solution that can be tailored to the needs of the OEM thereby delivering an optimal result. The ignition system is capable of delivering a high range of ignition energy, from <math>< 180 \text{ mJ}</math> to an ultra-high level of 750 mJ.



- Customizable current profile
- Plug life indicator (PLI)
- Capable of delivering 60A primary current
- Dynamic energy management to maximize plug life



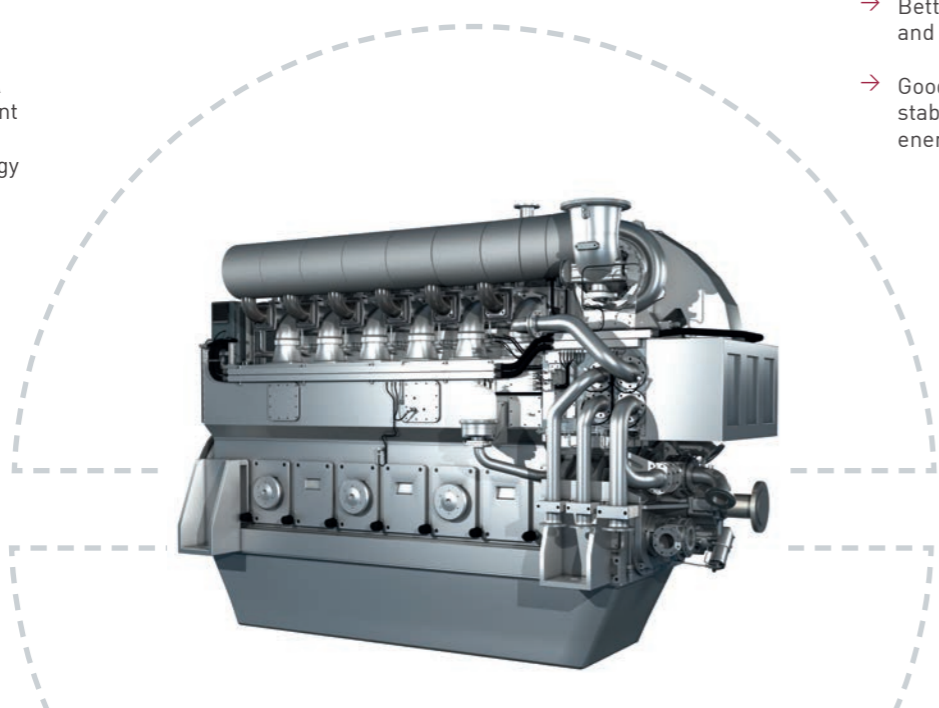
- Ignition driver as a stand-alone unit or in an integrated stacked solution



- Low leakage, high temperature and high kV operation (pushing to 40kV +)



- Standard Ni-Ni plug and precious metal plug (2x life)
- Better ignitability, and startability
- Good combustion stability with minimal energy ignition



IGNITION COILS

Woodward offers a wide range of ignition coils compatible with inductive ignition, legacy Capacitive Discharge (CD) ignition and high-energy, state-of-the-art PWM CD Ignition such as the LECM EID. Woodward's ignition coil design maximizes overall ignition "system" capability by boosting the kV capability and energy delivered to spark plugs.

- 40kV+ at 105°C and worst-case extender leakage
- Can support 0-50A primary current
- 150mA secondary current
- CSA-certified
- Customizable length to fit both high-speed and medium-speed engines
- Proven dielectric strength at 40kV+
- High temperature capability

EXTENDERS AND LEADS

Standard catalog designs are not optimized for engine designs. Woodward offers multiple extender designs with a high degree of customization to fit OEM needs. Extensive testing through cutting-edge, high-voltage testing equipment ensures the extender designs and materials have the lowest leakage and highest reliability.

- Customizable length to fit both high-speed and medium-speed engines
- Proven dielectric strength at 40kV+
- High temperature capability
- Minimal leakage design to maximize energy delivered from the coil to the plug



FTI PRECHAMBER SPARK PLUGS

Woodward's FTI igniters are a leap forward in "spark igniters" for high BMEP, lean burn gas engines that burn natural gas or biogas. The FTI plug is proven to improve combustion stability and combustion speed. When customized for specific engine requirements, the FTI greatly increases engine efficiency and stability.

These new igniters use a "breakthrough" design that extends the igniter's operating life with and without using precious metal electrodes to meet the demands of longer operating life. FTI reduces the possibility of misfires when igniting leaner fuel mixtures, resulting in lower NOx emissions and the occurrence of unburned hydrocarbons.

- Better reliability: Designed to handle the rigors of modern high BMEP engines
- Engine-compatible: FTI igniters are customized to fit specific engine combustion requirements
- Combustion efficiency: FTI are capable of increasing combustion efficiency from 1% to 4%
- Minimal energy needed to light the fuel. This results in maximized plug life when used with a state-of-the-art EID delivering only the required energy



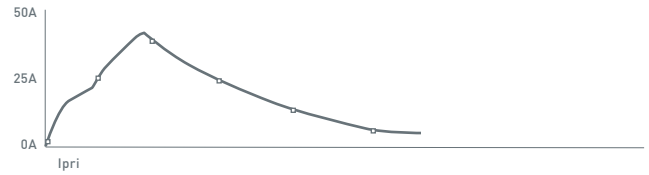
STAND-ALONE
IGNITION DRIVER

INTEGRATED LECM

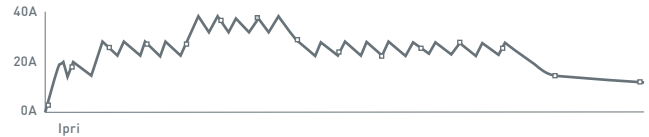
LECM (EID) LARGE ENGINE CONTROL MODULE – ELECTRONIC IGNITION DRIVER

Programmable current profile offers the ability to meet any desired energy delivery. Independent control of voltage, current and duration offers the ability to deliver either high or low energy without compromising the system's kV capability. The EID is available as a stand-alone driver to complement an OEM ECU or as a three-stack solution to meet all the OEM's engine management needs.

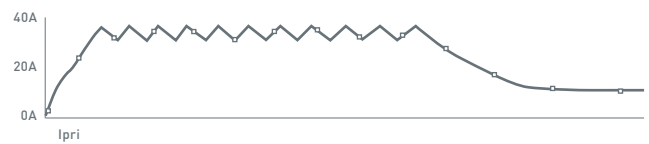
- Dynamic energy delivery as the plug ages
- Multi-strike and multi-step current profiles
- 400W boost driver capable of delivering up to 750mJ, 60A primary current and up to 1500us
- Ultra-high energy as well as minimal energy excitation
- Plug life indicator estimates the remaining life of spark plug
- 20-channel output



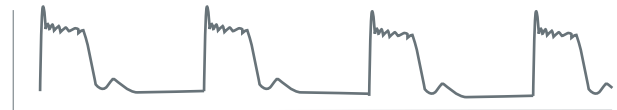
CD LIKE IGNITION PROFILE



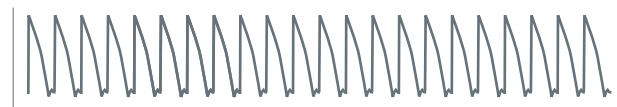
MULTI-STEP IGNITION WAVEFORM



SQUARE WAVE IGNITION WAVEFORM



SQUARE WAVE MULTI-STRIKE



MEGA-STRIKE – CD LIKE MULTI-STRIKE

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