Fast Turbulent Igniter (FTI)

Pre-chamber Spark Plug

Applications

Woodward's Fast Turbulent Igniter (FTI) provides fast, consistent ignition of gaseous fuel mixtures in internal combustion engines. This type of ignition source enables a more even and complete burning of the fuel, increasing engine efficiency and improving exhaust emissions. The FTI is designed to optimize the operation of high-performance, high-BMEP, lean-burn natural gas engines used in stationary power applications.

Large-bore engines running on lean gaseous fuel mixtures often experience a slower burn rate of the fuel and incomplete combustion. These conditions reduce combustion efficiency and contribute to problematic exhaust emissions. Typical J-gap spark plugs try to address these performance issues by increasing the spark energy, which shortens plug life. To counter decreasing spark plug life, J-gap manufacturers often increase electrode area, which has a "quenching" effect on the ignition spark, increasing combustion variability; or they use precious metals, which increase manufacturing complexity and reduce plug durability.

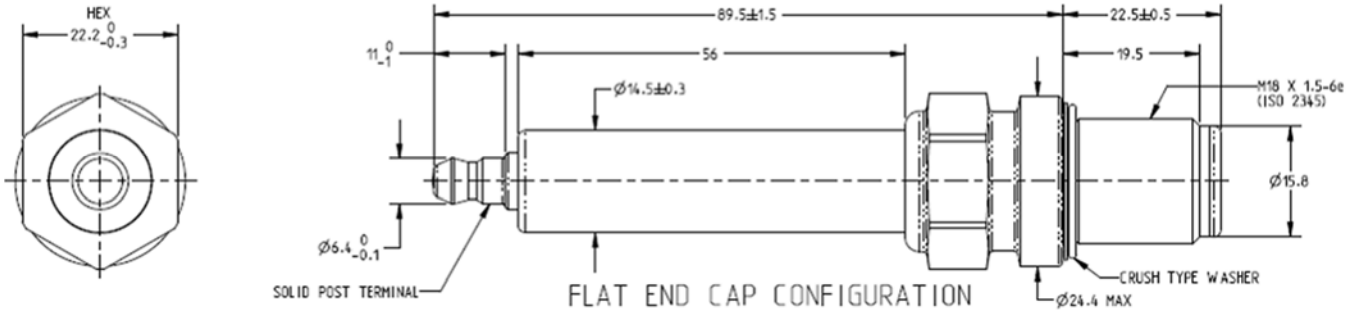
Description

Woodward's Fast Turbulent Igniters use a patented pre-chamber combustion technology to improve combustion initiation beyond J-gap and conventional pre-chamber spark plugs. Faster and more consistent pre-chamber combustion generates jets of hot gases directed through carefully designed ports in the end of the pre-chamber and into the main fuel-air mixture in the engine's cylinder. These gas jets then ignite the main fuel-air mixture at multiple sites within the cylinder while generating turbulence, enabling faster, more complete combustion of the air-fuel mixture compared to a single ignition point whose flame front emanates more slowly through the cylinder's volume. The FTI's design also enables these gas jets to travel faster and more uniformly than competitive pre-chamber plugs, offering the lowest combustion variation available in open-chamber engine designs. Lastly, the FTI's unique and patented design enables consistent ignition without the need for a high-energy ignition system, reducing the need for precious metal electrodes to achieve long life. It is also customizable to meet specific engine combustion requirements.

- Improves engine efficiency
- Reduces exhaust emissions
- Fast, stable fuel combustion
- No thermal run-away for good knock margin
- Longer life
- Customizable design

Installation

All FTI spark plugs have the same physical dimensions.



Specifications

Mechanical

Maximum cylinder pressure	250 bar (nominal)
Maximum cylinder head seat temperature	300 °C
Spark plug base threads	M18 x 1.5
Installation torque	50 ±5 N·m

Electrical

Suppression resistance	3.0 to 7.5 kΩ
Maximum working voltage	40 kV

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