TRITON V
Cylinder Pressure Monitoring

CPM 500

✓ Replaces mechanical indicators on diesel engines
✓ Improves combustion
✓ Reduces fuel consumption and emissions
✓ Optimises engine settings
**TRITON V**

**Cylinder Pressure Monitoring (CPM 500)**

The proven advantage of the electronic TRITON V system compared to mechanical engine indicators is a considerably simpler and far more accurate operation. After acquisition, recorded data can be downloaded immediately to a PC or notebook via a USB cable, and HEINZMANN visualisation and data processing software used to process the recorded data at leisure.

Transmitting data by telephone line or the internet makes information available for expert analysis and condition monitoring at a remote location. An optional software upgrade allows power calculation for every cylinder to assist cylinder balancing.

Designed for periodic monitoring of cylinder pressure on diesel engines, the electronic indicator CPM 500 can record cylinder pressure values on a maximum of 20 cylinders (option: 160 cylinders) on two-stroke diesel engines operating at speeds of 40 to 300 rpm and on four-stroke medium speed diesels with rated speeds up to 1,000 rpm.

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**TRITON V Benefits**

- Replaces mechanical indicators on diesel engines
- Periodic and accurate monitoring of cylinder pressure on diesel engines
- Accurate, reliable, durable and cost-effective pressure sensor
- Optimised engine settings
- Improved combustion
- Reduction of fuel consumption and emissions
- User friendly electronic engine indicator

Conventional mechanical indicators are only partly suited to modern internal combustion engines since they can no longer achieve the required accuracy as peak cylinder pressures and temperatures rise.

Optimised engine settings based on accurate cylinder pressure readings. This improves combustion and thus fuel consumption and emissions.

This will become increasingly important as a method of ensuring that NOx emissions are kept in compliance with the IMO Tier II limits, which came into effect from January 2011.
DESIGNED FOR
ROBUSTNESS, PRECISION
AND LONG LIFE

The CPM 500 cylinder pressure indicator is characterized by its high accuracy, reliability and ease of use. Central to the performance of CPM 500 is the proven accuracy, reliability, longevity and cost effectiveness of HEINZMANN’s advanced type HTT (High Temperature Transmitter) pressure sensor employing TiON (titanium oxynitride) thin film technology. More than 25,000 type HTT sensors have been delivered for a range of closed loop control applications.

They are affordable and their robustness and performance has been proven in many applications. As a result, standard effective life is more than 16,000 operating hours on both diesel and gas engines. On this basis we believe that our sensors offer the best combination of robustness, longevity, reliability, price and, above all, accuracy available on the market.

With our hand operated pump and manometer device, TRITON V provides customers with a quick and straightforward way of investigating apparently anomalous readings as well as achieving compliance with the ISO 9001 requirement for end user testing of measuring equipment. The HEINZMANN device is capable of loading the CPM 500 with static pressures up to 300 bar so that verifying its performance is a simple matter of comparing the readouts of the CPM 500 and the test manometer.

This technology of cylinder pressure monitoring is already standard application for all newly coming MAN B&W MC/MC-C and Wärtsilä RTA/RT flex engines (04/2010) by Hyundai Heavy Industries and will be supplied on Kawasaki Heavy Industries built MAN B&W two-stroke engines (04/2010).
**USER FRIENDLY ELECTRONIC ENGINE INDICATOR**

Data recording with the HEINZMANN TRITON V CPM 500 device has proven considerably more simple and more accurate than with mechanical engine indicators.

As well as key engine operating information which can be read out from the CPM 500 after data acquisition, recorded values can be rapidly downloaded to a PC or notebook via a USB cable.

The device is designed for periodic cylinder by cylinder monitoring of combustion pressure on diesel engines and in its standard version can record the cylinder pressure values from up to 20 cylinders. Further versions are offered for different loadings on a maximum of 160 cylinders on two-stroke engines operating at speeds from 40 to 300 rpm.

Without requiring a connection to an encoder or pickup on the engine flywheel, the CPM 500 calculates $p_{\text{max}}$ and $p_{\text{comp}}$, imep and ipower for every cylinder using a specially developed mathematical algorithm.

The CPM 500 instrument can also be used on the four-stroke auxiliary genset engines with rated speeds up to 1,000 rpm typically installed alongside two-stroke main engines in many ships (e.g. container ships, tankers, bulkers, etc.).

Charging process of standard rechargeable 9 V block battery is effected via the USB port of PC or notebook and does not require any additional charging station in order to reduce the number of components.
There are several different versions of TRITON V CPM 500 software available. The range begins with a CPM 500 package which without TDC (Top Dead Centre) position marking calculates $P_{\text{comp}}$ values on two-strokes and goes up to an advanced visualisation software which calculates ipower and imep using a mathematical algorithm.

The range begins with a CPM 500 package which calculates $P_{\text{comp}}$ values on two-stroke without TDC position marking. The enhanced version calculates ipower and imep using a mathematical algorithm. The most advanced CPM 500 software version allows to monitor a maximum of 160 measurements on different load cycles. Optionally with or without a connection to a TDC encoder system.

The HEINZMANN visualisation and data processing software is used to process acquired values and display the derived information at leisure. Similarly, the resulting files can be transmitted over a radio (satellite, mobile phone) to the engine builder and ship owner for separate, independent evaluation.