



## Electronic Fuel Management monitoring equipment

Marine Fuel Oil is the single largest operating expense and greatest contributor to engine wear, damage and maintenance. The importance of monitoring Fuel Oil bunker deliveries, to ensure that the ordered fuel is of the right quality, is paramount.

The use of onboard test equipment, can provide reassurance for fuel users and financial control and payback for shipowners and operators. Such fuel management allows quick response in the case of off-spec bunkers or contaminated luboil.

The range of electronic Fuel Management Monitors includes the following equipment:

A **Digital Viscometer** - to check the fuel (or luboil) viscosity, to verify that the correct fuel grade or blend has been delivered, to give the value for CCAI (ideal for vessels taking on MFO or having 4-stroke engines) and calculate the value of density (corrected from 50 C to 15 C). It does the following calculations : Viscosity, Calculated Carbon Aromaticity Index (CCAI), Density.

A **Combined Viscosity and Density Tester** - to measure both parameters using the same testing device, and determine the density of the fuel oil at 15C.

Viscosity and density are measured with an accuracy of +/- 3%, in the same test tube at the same temperature. By employing the corresponding hydrometer, the density at 15°C of fuel oils will also be determined.

With actual density known, it is easy to measure viscosity accurately. Simply use the same pre-heated sample and employ the falling ball principle.

Both test results give excellent reference against delivery data and allow rapid action in case of (a) off spec bunkers, and (b) contaminated lube oil. The measuring range for Viscosity is 25 - 999 cSt at 50°C, and for Density is 820-1050 kg / m<sup>3</sup>. The size of the Tester is 160x260x240 mm

### Benefits

- Only one test device for two important parameters
- No sample change for carrying out each test
- Use of same test temperature (50°C)
- Ability to re-calculate density to 15°C
- Easy to use by non-trained personnel
- Results close to laboratory standards



An **In-Line Bunker Viscosity sensor** - to provide a continuous measurement of temperature and viscosity, with an accuracy of 1.5%. Used with customised electronics, it can provide accurate and continuous data for office use or to handle any potential disputes.



**The Power of a Simple Solution** - Using patented electromagnetic technology the sensor has a single moving part--a highly polished stainless steel piston. The piston is driven through fluid in a small measurement chamber. Proprietary circuitry then analyses the piston's travel time to measure absolute viscosity and monitor temperature. The In-Line viscometer is nearly maintenance free and extremely inexpensive to install.

**Software & Electronics** - The Optional computer software receives and displays the average viscosity and temperature values in graph format over the period of fuel transfer. The management unit stores collected data for a maximum period of 16 hours providing the facility to access this information for record purposes or dispute resolution. The electronic board has a number of key features:



- Cost effective solid state processor
- Continuous monitoring of viscosity and temperature
- 4-20mA outputs for remote viscosity control or recording
- Easy integration into your operation
- Universal power supply (100-240 Vac or 9 - 36 Volts DC, 50-60 Hz)
- Internal power line noise suppression

The In-Line Viscometer system can be easily retrofitted. It represents an essential monitor for bunker purchasers, providing a maintenance free system coupled with quick payback.

For any other options of luboil test kits, Vibration monitoring equipment, or Engine Cylinder Pressure monitoring (including an online version) contact our Sales Office.