



ACCOUSTIC OIL CONTENT MONITOR

TYPE OCM-21

GENERAL:

Typical naval vessel bilges may contain a great many components; e.g., an aqueous phase and an oil phase, including some detergent and solvent ions, partitioned between these. The aqueous phase is separated from the oily waste in the **Oil Water Separator (OWS)** and further refined by micro filtration in the Membrane OWS Polishing System. It is the effluent from the polisher that is to be monitored for oil content. If the polisher is working properly, this stream will have only low levels of oil remaining in it. The **Oil Content Monitor (OCM-21)** is to monitor this oil concentration and provide data of the oil loading, in ppm. If the oil loading rises above an acceptable pre-determined level, the system outputs an alarm signal which can be used to actuate a valve(s) in order to re-direct the stream, for further processing.

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SENSOR PROBE



END VIEW

TECHNOLOGY REQUIRED:

Marine Electric Systems, has researched a number of physical parameters which might measure the effluent oil content. However; the majority of these techniques have sensitivities, to oil content, which are too low, to be of practical value in the 0-15 ppm range. After preliminary testing, we believe the “absorption/dispersion” of sound or ultra sound, is proving to be the most promising.

THEORY OF OPERATION:

As with any type of measurement technique; e.g., optical, resistive, capacitive, etc., sensor sensitivity to the desired parameter being measured, is extremely critical. As a sensor manufacturer, Marine Electric has experimented with a number of sensors. At this time, a single immersion type combination ultrasonic transducer and reflector, deployed “directly in the effluent stream” (see photo), has yielded best results. The transducer accepts gating/timing pulses from the electronic unit and emits bursts of high frequency, low intensity energy, into the effluent stream. The returned energy, a minimum of two echoes, per burst, per stream constituent, is inputted to the micro-processor, converted into individual relative intensities and stored in separate registers for each echo. The electronic unit processes the echo data into useable information for: local display (in ppm), 4-20mA control and communication to the ship’s PC (for printing and data logging), via a digital RS-485 output buss line.



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