Robotics System for Oil Analysis Spectrometer

Double Disc Rapid Robot, Model D2R2

"Something Good Has Just Gotten Better"

The Rotating Disc Electrode (RDE) technique has a long history as an analytical method to analyze wear metals, contaminants and additives in new and used oils. Over the years it has been continuously improved, and today it is the standard used by the United States Department of Defense and the world's largest independent laboratories. For most applications, it is the preferred method for the analysis of used oils, particularly in high sample volume laboratories. In the past, the primary limitation of the RDE technique had been the fact that it is labor intensive and a cost-effective method for automation had yet to be developed. Finally, however, this argument is no longer true.

The Robot Mounts to the Spectroil M Sample Stand

"The introduction of the Double Disc Rapid Robot (D2R2) makes it possible to provide automatic and unattended oil analysis with the RDE technique."

Description:

The Double Disc Rapid Robot (D2R2) is an innovative design to automation and consists of two parts, a robot to exchange consumables, and an automatic sample changer for fully automatic and unattended operation. It is a robotics system that mounts to the spectrometer sample stand and fulfills all the functions of sequentially introducing and removing oil samples and exchanging graphite electrodes. It is self-contained and works independently of the spectrometer operating software. Although operation is automatic, it also has the capability to manually sequence through each of the robotics functions.

The Double Disc Rapid Robot (D2R2) was designed specifically for oil analysis using the RDE technique. Automation has been made possible with the innovative use of the double disc approach. The need for a sharpened rod electrode for each analysis has been eliminated, and the requirement to change graphite electrodes has been automated. The result is a simple and rapid robotics system for total automation of the Spectroil M Oil Analysis Spectrometer.

"Better precision is obtained with the D2R2 because the automatic routine is more repeatable and consistent than manual operation."

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Industrial Tribology Systems

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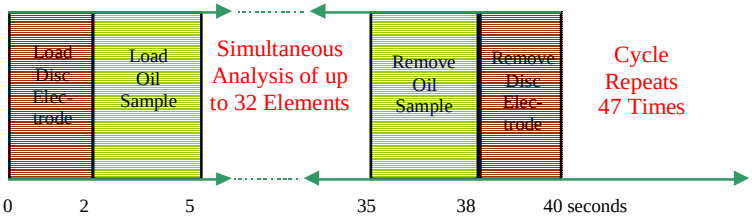
D2R2 Operation:

The D2R2 eliminates the need for continuous operator intervention by automatically performing all sample stand preparation and sample handling functions. A tray with 48 oil samples is placed into the robotic sample changer and two tubes of disc electrodes are loaded in the dispenser. After the door is closed, the start button initiates automatic operation. Two disc electrodes are then automatically dispensed and mounted in the sample stand. The robotic arm in the sample changer brings the first sample cap to the electrodes and raises it for normal spark excitation. Thirty seconds later the analysis is terminated, the oil sample is removed and disposed of, and the used disc electrodes are automatically discarded. The process repeats with the introduction of new disc electrodes for the next oil sample.

Automatic Sample Changer

Features:

- Fully automatic, unattended operation
- Sample throughput of up to 80 samples per hour
- Reduces operating costs
- Designed from the ground-up for oil analysis
- Sensors to monitor operation
- Eliminates the need to clean and re-sharpen electrodes
- Maintains JOAP data base correlation
- Window to view automatic sample analysis functions



Timing Cycle for Automatic Operation

Specifications:

Sample Tray:	*Indexed and numbered for 48 samples*
Speed of Analysis:	*40 seconds (30 sec. analysis time plus 10 sec. to change sample and consumables)*
Oil Sample Vessels:	*Disposable*
Size:	*13.75 x 10.5 x 18 in (35 x 27 40 cm)*
Weight:	*40 lbs (18 kg)*
Power:	*Supplied by Spectroil M*

"The D2R2 is fast and speeds up the time required to prepare the sample stand, leading to greater sample throughput."

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