

# CSI 5200 Machinery Health™ Oil Analyzer



The CSI 5200 allows for onsite testing of machinery oils and lubricants.

- *Comprehensive coverage of chemistry contamination and wear eliminates the need for multiple analyzers and constant off-site testing*
- *More accurate results and easier diagnosis*
- *Save steps for Wear Debris Analysis with integrated method of patch preparation*
- *Covered by ASTM Standard Practice ASTM D7416-08*

## Overview

Unseen corrosion, contaminants, improper lubrication, and machine wear are a primary root cause of equipment failure. Testing machinery lubricants is a necessity but sending samples to an offsite laboratory can sometimes prove to be untimely and inefficient.

The CSI 5200 Machinery Health Oil Analyzer is a multi-functional analyzer that is uniquely capable of detecting most lubricant-related problems in gears, pumps, compressors, turbines, engines, hydraulics, and process machinery. The CSI 5200 allows you to test oils and lubricants onsite, eliminating the need to send samples to an offsite lab. This time-saving method delivers results efficiently and effectively.



*The CSI 5200 is part of a complete minilab system that provides comprehensive oil analysis results.*

## **Precise Wear Debris Analysis in less time**

The CSI 5200 measures chemistry changes by comparing the dielectric of new and used oil samples. This process enhances Emerson's method of ferrous/non-ferrous separation through increased sensitivity to small particles. The CSI 5200 adds laser particle counting using a specialized method of delivering sample fluid that decreases the chance of missing larger particles as they settle. Wear debris analysis is made faster and easier with the ability to isolate ferrous, non-ferrous, large and small particles onto separate filter patches.

Color-coded LEDs and onscreen instructions prompt you through each step of the test sequence eliminating the possibility of skipping a step. Results are delivered in approximately eight minutes. Recorded data can then be viewed and analyzed in AMS Suite: Machinery Health Manager. AMS Machinery Manager diagnoses and communicates the health of mechanical and rotating machinery using data from several predictive maintenance technologies. The result

is a comprehensive view of each monitored machine and a more accurate diagnosis when developing problems are discovered.

## **Part of a Complete System**

The CSI 5200 is part of a complete minilab system. The minilab provides comprehensive oil analysis results including particle count, parts per million distribution, ISO codes, ferrous density, oil chemistry, water-in-oil, viscosity, and detailed wear debris analysis. Along with the CSI 5200, the minilab contains the 52DV Digital Viscometer, the 52ZM Stereo Zoom Microscope, the 51CV Camera Video Capture kit, and AMS Machinery Manager.

## **ASTM D7416-08**

The CSI 5200 Machinery Health Oil Analyzer is covered by ASTM Standard Practice ASTM D7416-08. This ASTM Standard Practice ensures that users can follow standardized operating guidelines for repeatable results. The standard also describes the CSI 52DV Digital Viscometer, the CSI 52LM Lab Microscope, and AMS Machinery Manager software.

## Specifications

### Physical Dimensions

- Depth: 14.25 in (36.2 cm)
- Height: 17.87 in (45.4 cm)
- Width: 17.25 in (43.8 cm)
- Weight: 27.7 lbs (12.5 kg)

### Power Supply

- 100-240 VAC, 6 A, 47-63 Hz input
- 15V DC, 7.5 A output

### Interface

- Buttons located on the front panel of the CSI 5200 and simulated in the software control testing
- 9-pin sub-D cable to computers via RS-232C interface (cable provided with unit)
- Special 15 pin sub-D port for Digital Viscometer
- One 9 pin sub-D interface to electronic balance
- 9600 baud communication
- Multiple front panel LEDs indicate test status
- Two drain ports for output to waste containers

### Solvent

A suitable solvent must be obtained for dilution and cleaning purposes. Extra pure lamp oil (such as clean low-odor kerosene) is inexpensive, widely available, and works well for most samples. Heptane is recommended for use when making filter patches, but mineral spirits can also be used. Isopropyl alcohol can be added to any of these to help deal with water contamination for test '3' and for making filter patches.

### Outputs

Trivector plot summarizes wear, chemistry and contamination alarm status in both the software and on the face of the instrument with colored LEDs.

### Chemistry:

- Chemistry Index - Lube degradation
- Dielectric - Absolute measurement of dielectric

### Contamination:

- Contamination Index - Water and gross particle contamination
- Large non-ferrous indications  
Non-ferrous particles > 60 microns
- Droplet indications - Free water droplets or other corrosive fluid droplets

### Estimated water content:

- Percent total water content of the sample

### Particle Count:

- ISO 4406 and Extended NAS 1638 Cleanliness Codes
- Particle distribution in parts per million (ppm): >4 µm, 4 to 6 µm, 4 to 14 µm, and >14 µm

### Machine Wear:

- Ferrous Index - Ferrous particles > 5 µm
- Large ferrous indication - Ferrous particles > 60 µm

### Wear Debris Analysis Filter Patches:

- Large Ferrous Particles
- Small Ferrous Particles
- Large Non-ferrous Particles
- Small Non-ferrous Particles

### Hardware Conditions

- Storage: 32-120° F (0-50° C)
- Operation: 59-86° F (15-30° C), temperature constant within ± 5° F (3° C)
- Sample Prep and Test Time: about 8 minutes
- Sample Volume: about 50 ml is required (1/2 of a standard 4 oz. bottle)
- Lube types: all industrial lubricants
- Cleaning: flush using kerosene or lamp oil
- Calibration: Calibration of test 1 and 2 must be verified weekly with Emerson supplied calibration fluids

**Ordering Information**

Part Number	Product Description
<b>Standard Accessories (Included with the CSI 5200)</b>	
A5200TV	CSI 5200 Machinery Health Oil Analyzer
MHM-93030 or MHM-93038	Electronic scale with RS232 interface for measuring dilution ratio
MHM-92610	Pump for drawing samples from unpressurized systems
MHM-10647	Polyethylene wash bottle for dispensing kerosene or other solvent
MHM-99519	1000 ml glass beaker for dilutions
MHM-99528	Handheld magnetic retriever with sleeve (A5051MR-1) for separating ferrous/non-ferrous particles
MHM-92642	Forceps for holding filter patch
B5051WC	Waste container system
MHM-10603	Swabs
MHM-10605	10ml syringes
MHM-10610	30ml syringes
A50053	Calibration fluids
MHM-92079	Polyethylene tubing
MHM-92631	5 micron filter patches
MHM-10698	Clear plastic sample bottles
A5051VP-DM or A5051VP-IN	Vacuum pump

Part Number	Product Description
<b>Required Accessories</b>	
A475100	AMS Machinery Manager OilView Minilab Module

Part Number	Product Description
<b>Recommended Accessories</b>	
A0052DV	CSI 52DV Digital Viscometer
A510050	Digital Viscometer calibration fluids
A5052ZM-DM or A5052ZM-IN	CSI 52LM Lab Microscope
A52XGA-USB	CSI 51CV Wear Debris Image Capture Kit
A475103	Wear Debris Analysis Module software
A475101	AMS Suite: Machinery Health Manager OilView LIMS (Lab Information Management Software)
CSI 5200 INSTALL	Tribology Program Startup Service

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