



PDA100 Portable Automatic Wear Particle Analyzer



PRODUCT INTRODUCTION

The PDA100 portable automatic wear particle analyzer is a portable instrumentation system based on video streaming, high acquisition rate, dynamic imaging analysis, and intelligent wear particle recognition and classification. This instrument is primarily designed for monitoring contaminants in engine lubricating oil, aircraft hydraulic oil, aviation fuel, and transformer oil. It can automatically sample oil specimens of varying viscosities and directly capture morphological images of particulate contaminants. The built-in automatic abrasive particle intelligent recognition algorithm software calculates the area and equivalent circular diameter of particle contaminants in accordance with ISO 11171, and outputs the quantity and classification of the particles. It enables counting of particles larger than 4 μm , concentration measurement for particles between 5-10 μm , and automatic classification of particles larger than 20 μm into categories such as cutting wear, sliding wear, fatigue wear, non-metallic abrasives, fibers, water droplets, and bubbles, with concurrent direct image visualization.

APPLICATION FIELD



Military field



Aerospace field



Power industry



Transportation industry

THE PERFORMANCE CHARACTERISTICS OF

- The instrumentation utilizes an image-based contamination detection principle, capable of eliminating interference caused by bubbles.
- The instrumentation employs 5x optical magnification for detection, achieving performance and magnification levels significantly surpassing comparable products in the industry.
- Capable of simultaneously outputting contamination levels as well as the wear particle types and quantities of typical wear particles per unit volume.
- The instrumentation's built-in detection module employs a large depth-of-field, high-resolution optical system capable of analyzing the color and contours of particles such as iron, copper, fibers, bubbles, water droplets, and oil sludge. This enables precise classification and sizing of particle attributes, along with the capability to output spectra of individual typical particles for viewing and analysis.
- The instrumentation software allows users to define contamination counting, segmentation, and grading methodologies in accordance with customer enterprise or internal contamination standards.
- The instrumentation software includes functions for custom editing and management of oil samples or equipment, historical data report retrieval, device wear analysis, contamination level assessment, and particle count trend statistical analysis.
- The instrument incorporates automatic sample intake and cleaning functions, with monitoring of sample cell cleaning effectiveness via software; the durations for automatic sampling and cleaning are configurable.
- The instrument includes a built-in high-precision metering pump with a sample intake accuracy of 0.1 μL , ensuring high-precision quantitative detection and analysis.
- The instrument's contamination level can be automatically calibrated using standard reference materials, supports third-party metrological calibration, and provides corresponding third-party test reports.
- Adopting high-strength injection molded shell, compact structure, lightweight, and easy to carry; The panel adopts high-precision aluminum alloy integrated processing technology, which is simple, beautiful, and durable.

TECHNICAL SPECIFICATIONS

| Project | Data |
|-----------------------|---|
| Detection Principle | Microfluidic Imaging Recognition Technology |
| Detection Range | 4~200 μm |
| Industrial Camera | 1.3-megapixel CMOS camera; resolution 1280 \times 1024 |
| Test Subjects | Contaminant particles in lubricating oil including copper, iron, fibers, bubbles, water droplets, sludge, and other impurities |
| Contamination Index | NAS1638, ISO4406, GJB420 grades and particle counts; supports user-defined contamination counting, segmentation, and grading methods |
| Display | 12.1-inch 1280 \times 800 color LCD with touchscreen operation |
| CPU | 8-core 64-bit processor; Four Cortex-A76 cores and four Cortex-A55 cores with a dedicated NEON coprocessor Cortex-A76 clock speed up to 2.4 GHz, Cortex-A55 clock speed up to 1.8 GHz |
| GPU | Integrated ARM Mali-G610 GPU; Built-in 3D GPU; Compatible with OpenGL ES 1.1/2.0/3.2, OpenCL 2.2, and Vulkan 1.2 |
| NPU | Embedded NPU, supports INT4/INT8/INT16/FP16 precision, computing power up to 6 Tops |
| RAM | 16GB |
| Storage | eMMC 256GB |
| Interface type | Nylon tube with 3 outer diameter and 2 inner diameter |
| Detection time | Less than 1 minute |
| Operating Temperature | -20 ~60 |
| Operating Voltage | DC 24V or Power Adapter |
| Maximum Power | Less than 100 W |
| Output Port | USB/RJ45 |
| Housing Material | PP, Aluminum Alloy |
| Weight | 10±0.2kg |