

Building industry leading test platforms to automate sensing and improve measurements by reducing human errors.



# BOCLE 2.0

## AUTOMATIC

# Ball on Cylinder Lubricity Evaluator

### The System

Paltro Ball on Cylinder Lubricity Evaluator (BOCLE 2.0) is a compact, fully automated desktop instrument for ASTM D5001 to assess wear aspects of the boundary lubrication properties of aviation turbine fuels on rubbing steel surfaces.

BOCLE 2.0 is a fully automatic system including loading, conditioning, and test sequences with automated operation while offering unmatched user convenience. Comprises a compact bench top mounted unit, humidity and temperature controller, and PC for operation with Lab IQ control and data acquisition system. It brings a level of automation and ease of use to ATF lubricity testing with high repeatability and reproducibility.

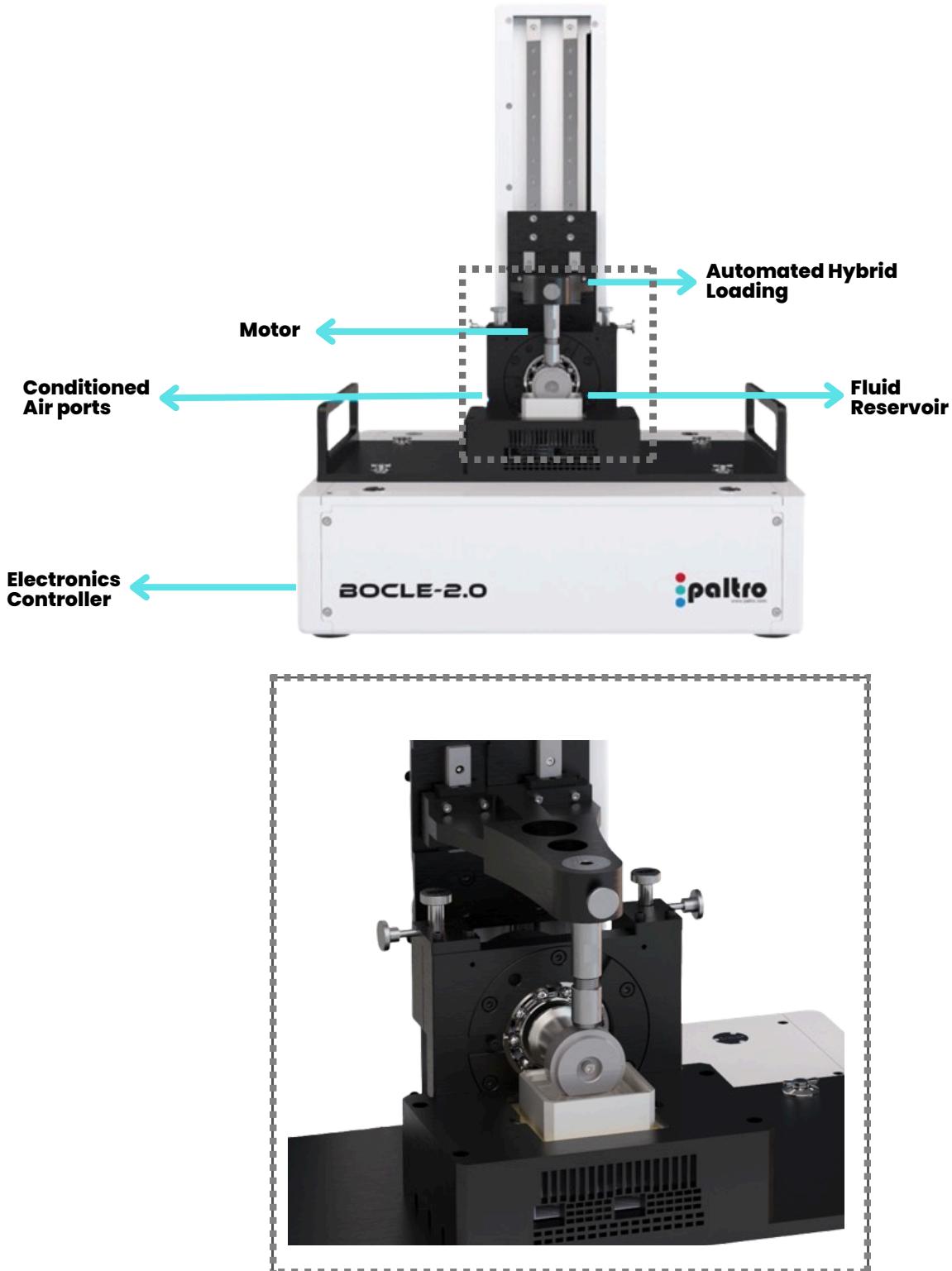
### Features

- Fully automated loading, includes unique hybrid loading system
- Microprocessor based system controls for all instrument functions
- Automatic control of test sequences, flow rate and conditioned air to reduce operator induced variability in test results
- PC based control and test sequence software included
- Pre-programmed ASTM D5001 test sequence for standardized tests
- Intuitive user interface with plug-and-play functionality

### Standards

ASTM: D5001: "Standard Test method for measurement of Lubricity of Aviation Turbine fuels by the Ball-on-Cylinder Lubricity Evaluator (BOCLE)"

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## Technical Specifications

- Load:  $1000 \pm 1$  g
- Speed:  $240 \pm 1$  rpm
- Temperature:  $25 \pm 1^\circ\text{C}$
- Sample Volume:  $50 \pm 1$  ml
- Conditioned Air:  $10 \pm 0.2\%$  RH at  $25 \pm 1^\circ\text{C}$
- Fluid pretreatment: 0.5 L/min flowing through & 3.3 L/min over the fluid for 15 min
- Fluid test conditions: 3.8 L/min flowing over the fluid
- Test duration:  $30 \pm 0.1$  min
- Power Supply: 100–230 V, 50/60 Hz



### Options

- Microscope with Digital Imaging & Software
- Zero Air supply (includes compressor and dryer)

### Consumables & Reference Fluids

- Test Balls (chrome alloy steel made from AISI E52100, with a diameter 12.7 mm, Grade 5 to 10, HRC between 64 to 66)
- Test Rings (SAE 8720 Steel, Hardness HRC 58 to 62 and Surface finish of 0.56 to 0.71  $\mu\text{m}$  root mean square)
- CRM, JFA ASTM D5001,  $\frac{1}{2}$  US Gallon
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### Power

- 110V-230V, 50/60Hz CE

### Weight & Dimensions

#### BOCLE 2.0:

- Net Dimensions: 480 x 560 x 770 mm
- Net Weight: 60 Kg

#### Humidity Controller:

- Net Dimensions: 460 x 550 x 300 mm
- Net Weight: 20 kg

Continuing R&D may result in specifications, appearance changes