



*Introduces the*  
**CANNON<sup>®</sup>**  
**CCS-2100<sup>™</sup>**

- **Solid-State Thermoelectric Temperature Management**
- **No Methanol Coolant or Other Flammable Liquids**
- **Fully Automatic Operation**
- **New Cell Warming Cycle**
- **No Solvents Necessary**
- **Measures Apparent Viscosity by ASTM D 5293**



**Contact CANNON for availability**

The **CANNON<sup>®</sup>** CCS-2100 Automatic Cold-Cranking Simulator measures apparent viscosity of engine oils per ASTM D 5293 at temperatures from -35°C to -5°C. Samples with viscosities from 1500 mPa•s to 27,000 mPa•s may be tested to determine whether the apparent viscosity meets the criteria described in SAE Specification J300. The new CCS-2100 uses a microprocessor-controlled, thermoelectrically-cooled rotor/stator mechanism. Sample handling and data collection are fully automatic.

Improved temperature management of the CCS-2100 rotor/stator eliminates the thermal lag seen in coolant-cooled rotor/stators. The thermoelectric sample warming cycle greatly improves the sample flushing process. Temperature management of the rotor/stator also eliminates the need for batching sample temperatures.

The CCS-2100 consists of a rotor/stator measurement system, 30-position X/Y Sample Table, and integral CCS Series II Controller. The rotor/stator measurement system is a unique viscometric cell attached to a vacuum system and a metering constant-displacement pump. This combination eliminates the need for solvent cleaning—the CCS-2100 cleans the viscometric cell by purging the previous test

sample with a portion of the new sample prior to making the viscosity measurement. The overflow from the viscosity measurement cell is drawn into a waste receiver by the vacuum system. A high resolution digital encoder attached to the rotor measures the rotor speed. The speed measurement data is then processed by the proprietary software

CCS-2100 SPECIFICATIONS	
<b>DIMENSIONS</b>	711 mm (28") high × 333 mm (13-1/8") wide × 645 mm (25-3/8") deep (add at least 100 mm (4") to depth for installation)
<b>WEIGHT</b>	61 kg (135 lbs.) for primary unit; 41 kg (90 lbs.) for Julabo cooling unit (if purchased from <b>CANNON</b> ®); 30 kg (65 lbs.) for accessories
<b>SHIPPING WEIGHT</b>	Approximately 95 kg (210 lbs.) for primary unit; 55 kg (120 lbs.) for cooling unit (if purchased from <b>CANNON</b> ®); 34 kg (75 lbs.) for accessories
<b>ELECTRICAL</b>	Model # CCS-2100: 115 volts AC ± 10%, 60 Hz, 1000W Model # CCS-2100F: 230 volts AC ± 10%, 50 Hz, 1000W
<b>OPERATING CONDITIONS</b>	15°-30°C, 10%-90% RH non-condensing, Installation Category II, Pollution degree 2
<b>FUSE RATING</b>	Controller: 115 volt unit: M 250V 8A, 5x20mm; 230 volt unit: M 250V 4A, 5x20mm Sampler: M250V 2A 5x20mm (both models)
<b>COMPLIANCE</b>	EMC directive (89/336/EEC); Low voltage directive (73/23/EEC), HI-POT (1900 VDC, 60 sec.)
<i>Use only the approved power cord supplied with your unit.</i>	

package to calculate sample viscosity. Viscosity calculation is based on test data and rotor/stator calibration information stored by the software. User interface options include an instrument calibration routine, configuration of test cycles, and multiple means of processing test data including save, print, and export via RS-232 serial port for LIMS capture.

## CCS Operation

Operation of the CCS-2100 is fully automatic following initial sample queuing and ID data entry. Without further operator involvement, the thermoelectric CCS-2100 completes testing of up to 30 samples. The results are automatically calculated, and the temperature, rotor speed and viscosity are reported for each sample.

## Required Accessories

An IBM®-compatible computer and a water chiller (circulation at only +5°C necessary!) are required for operation of the thermoelectric CCS-2100. Contact **CANNON**® Instrument Company for detailed computer and chiller requirements.

## CCS-2050 Available 3Q2001 !

The CCS-2050 Semi-Automatic Cold-Cranking Simulator will be available in the fall of 2001. The thermoelectric CCS-2050 requires the attendance of an operator for initial introduction of each sample. All other functions are identical to the fully-automatic CCS-2100 instrument. A *Mini-Volume Sample Injection Kit* will also be available for manually injecting samples of limited volume (5-10 ml).



**NEW CCS-2050**