Foreword:

Thank you for purchasing the miniAV-LT Low Temperature automated viscometer–part of the popular CANNON minAV family. This quick reference is intended to provide the operator with key information on operating the miniAV-LT and the few operational differences between the miniAV and the miniAV-LT.

- Introduction
- Specifications/Installation
- Preparing the miniAV-LT for testing

miniAV-LT Function:

The miniAV-LT is a fully automated kinematic viscometer specially designed to handle the unique needs of low temperature (sub-zero) kinematic viscosity determination of jet fuels, turbine lubricants, and hydraulic fluids. The miniAV-LT offers ASTM D445 and D2532 precision. At the core of the instrument resides the miniAV instrument–providing a familiar system and software user interface.

miniAV-LT Apparatus:

The miniAV-LT test apparatus consists of the same three major units as the miniAV; the Bath Unit, the Power Supply, and the Waste Receiver. The Air-Water Heat Exchanger is unique to the miniAV-LT.

AIR/Water Heat Exchanger

The Air/Water Heat Exchanger contains a radiator, fan(s), and water pump to circulate and cool a mixture of water and ethylene

glycol flowing through the hot side heat sinks surrounding the bath in the Control Unit. Circulation of the mixture helps remove heat from the Control Unit bath

Filling the Air/Water Heat Exchanger

Obtain a supply of quality automotive antifreeze (ethylene glycol) and mix it with water in a ratio of 30 percent antifreeze to 70 percent water. Do not mix antifreeze types in the Air-Water Heat Exchanger.

After you have secured the Exchanger tubing connections (see previous section) pour this antifreeze/water mixture into the reservoir opening on the top of the Air/Water Heat Exchanger until it is full (< 2 liters).

CAUTION

Ethylene glycol is a toxic substance. Use proper safety precautions when handling. Follow appropriate MSDS instructions.

NOTE

Depending on the amount of fluid displacement in the coolant lines, it may be necessary to add additional antifreeze/water mixture to the Exchanger when the unit commences operation. You will be able to observe the liquid circulating inside the reservoir from the opening at the top of the Exchanger during normal operation. If air bubbles are consistently visible in the coolant lines, add additional mixture until the Exchanger is full.

CAUTION

The water-antifreeze mix should be replaced annually for reliable performance and to prevent corrosion of internal components (see Flushing and draining the Air/Water Heat Exchanger,

miniAV-LT Specifications:

INSTRUMENT SPECIFICATIONS		
miniAV-LT Dimensions	BATH UNIT	AIR WATER HEAT EXCHANGER
Dimensions	254 mm wide x 437 mm deep x 598 mm high (10 x 17.25 x 23.5 in)	385.6 mm wide x 511.7 mm deep x 348.8 mm high (15.2 x 20.15 x 13.7 in)
Weight	27 kg (45 lbs)	14 kg (30 lbs)
Shipping Weight	72 kg (159 lbs) eith all units/accessories	N/A
Operating Conditions	15°C-30°C, 10%-90% RH non-condensing; Installation category IIPollution degree 2	
Fuse Rating	115V & 100V UNITS: M250V 8A, 1.25 x 0.25"; 230V Unit: M250V 4A, 1.25 X 0.25"	
Compliance	CE Mark: Pending	
Computer Requirements	Computer not included, Please contact CANNON for specifications	
Catalog Number/ Electrical Requirements		
	9725-A94 115V AC 50/60 Hz, 850 watt main unit	**9725-A96** 100V AC 50/60 Hz,850 watt main uni
	9725-A95 230V AC 50/60 Hz, 850 watt main unis	Air-Water Heat Exchanger 175 watts

Installation:

miniAV-LT setup can be accomplished in just a few minutes by following the instructions in the installation guide provided with the instrument.

NOTE: ***Once the machine and Viscpro II have successfully been installed, a calibration must be performed at the wash temperature (30°C) and each temperature at which the user wishes to run samples.***

Preparing the miniAV-LT for testing:

Calibrating the miniAV-LT:

Temperature calibration is essential for the proper operation of the miniAV-LT after installation. The calibration process consists of sending a temperature and its offset to the instrument, then waiting for the temperature to equilibrate. Equilibration is complete when the instrument stays within 0.02°C for 150 seconds. To calibrate temperature on the miniAV-LT, follow the instructions below:

NOTE: ***Depending on security level settings, it may be necessary for you to log in as a manager to complete the calibration.***

1. Click *Configure* from the primary display and select Instrument Settings from the Configure options for the desired instrument
2. Click *Tray Settings :Tube and Bath* option
3. Enter the temperature you wish to calibrate in the Bath Temp input box and then press *OK* to save new target temp
4. Click *Service* from the primary display and select your desired instrument
5. Click *Temperature Calibration* option. The Temperature Calibration Data window will open

NOTE: ***The value in the Calibration Temperature box should display the temperature which the user selected in the tray settings***

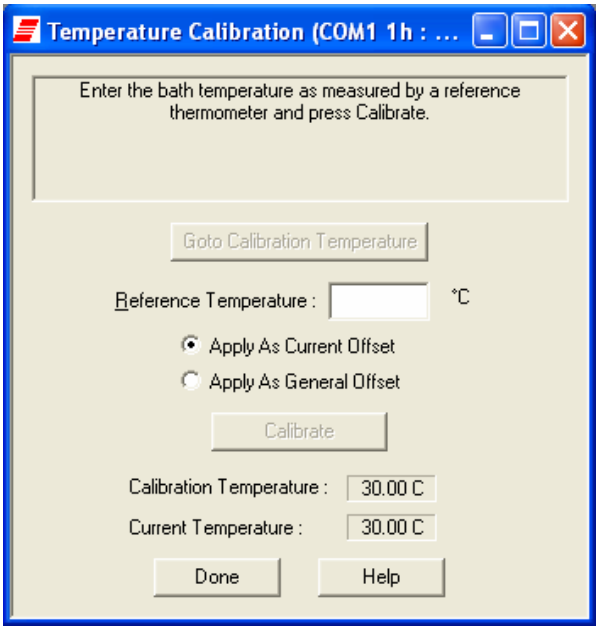
6. Click *Go to Calibration Temperature* button to set the target temperature of the machine to the desired temperature to calibrate (if not the wash temperature)

NOTE: ***The miniAV-LT must always be calibrated at 30°C because that is the wash/idle temperature at which the instrument will spend most of its time***

7. Place your reference thermometer inside the bath
8. Wait for the machine to equilibrate at the desired temperature
9. Enter the current temperature reading to the nearest 0.01°C from the

reference thermometer into the *Reference Temperature* input box

10. Click the *Apply as Current Offset* option button (always click the radio button for the *Apply as Current Offset* option when calibrating for a specific temperature
11. Click the *Calibrate* button and wait for the machine equilibrate using the offset
12. Repeat this entire process for the wash temperature and each temperature at which the user wishes to run samples



***NOTE*: Occasionally a temperature may require several calibrations in order to get an accurate calibration**

NOTE: The General Bath Offset is a factory-preset value affecting temperature control at all temperatures and should not be changed. General offsets are normally applied at -5°C for the miniAV-LT

***NOTE*: Once the wash temperature and all desired running temperatures have been calibrated, the user must train the tube sensors at each of these temperatures**

Training tube sensors:

MiniAV-LT tube sensors must be trained in order for the instrument to properly perform test functions. To train miniAV-LT sensors, follow the instructions below.

NOTE: ***Depending on security level settings, it may be necessary for you to log in as a manager to complete the calibration.***

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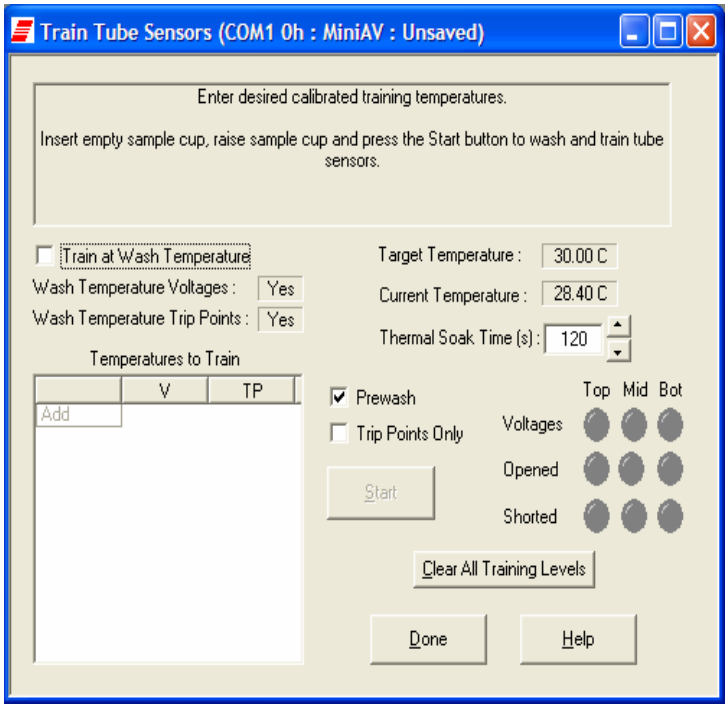
1. To train tube sensors, click *Service* from the primary display and select the *Train Tube Sensors* option for the desired instrument. The Train Tube Sensors window will open
2. Wait for the machine to equilibrate at the desired temperature
3. Click the *Train at Wash Temperature* checkbox if wash temp training is desired

Select the desired training parameters as follows:

Thermal Soak Time: Set your desired *Thermal Soak Time* using the scroll box
Temperature to Train: Input all desired temperatures to be trained in the *Temperatures to Train* list
Prewash: Click the *Prewash* option if the tube is not clean and dry. VISCPRO will initiate a cleaning cycle using current wash configuration settings prior to initiating the sensor training procedure

NOTE: ***The Instruction panel will instruct you to insert an empty vial in order to perform the prewash***

4. Raise the empty vial to enable the *Start* button
5. Click the *Start* button



NOTE: After the prewash is complete, the instrument will then obtain the voltages for each sensor at each of the specified temperatures.

NOTE: The instruction panel will then instruct you to insert a vial containing an oil with a viscosity 3 times the lower limit of the tube and raise it into the ready position for determining trip points.

NOTE: Once all voltages and trip points have been obtained for all desired temperatures, the tube sensors have been trained.

Bath fluid safety features:

If the bath fluid level drops to an unacceptable level, the light in the bath unit will go out, alerting the user that the level may be too low. Bath operations should be aborted until the level is checked and if needed, restored to an acceptable bath fluid level.

Checking the bath fluid level:

1. Open the left side panel (left ear) to view the LED light and to check the bath fluid level.

2. If the LED light is on (image B), you will need to add more bath fluid. Follow the instructions on page 77 of the manual for filling the bath.

Image (B) ***LED light***

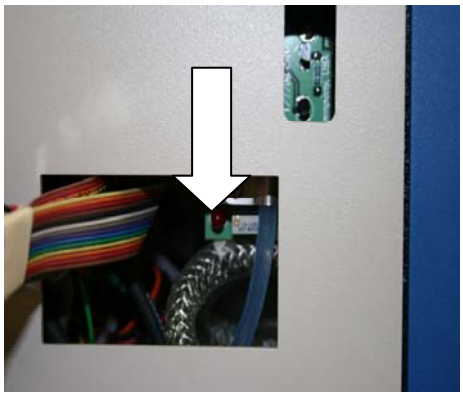


Image (C) ***The bath fluid level***