HVM472 Low Temperature (20°C-25°C) measurements

- Easy and reliable measurements below room temperature or close to the dewpoint
- Temperature range from +20°C up to 150°C, full coverage with a single instrument

Keywords: HVM472, Low Temperature, moisture, dewpoint

Introduction:

Many petroleum products, and some non-petroleum materials, are used as lubricants, and the correct performance depends upon the appropriate viscosity of the liquid being used. In addition, the viscosity of many petroleum fuels is important for the estimation of optimum storage, handling, and operational conditions. Thus, the accurate determination of viscosity is a very essential characteristic of many products specifications. Typically, the viscosity is measured in the range of 40°C to 100°C, while some applications go up to 135°C or down to 20°C.

To ensure accurate analysis under stable conditions, the HVM472 configuration has 2 independent baths, each equipped with one multi-range capillary and microprocessor temperature control and thermal timing systems. The accuracy and uniformity of the bath temperature, which exceeds the requirements of ASTM D445, is measured with a 0,001°C resolution. Three heaters per bath minimize equilibration time when changing to a higher bath temperature. The bath is designed to automatically compensate for the thermal volume expansion of the silicone oil from 20°C to +150°C.

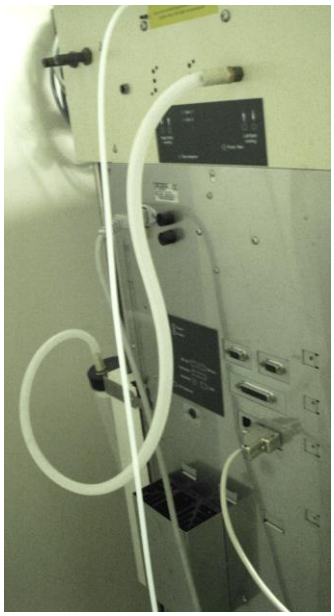
From over +40°C to +150°C, the HVM472 operates without any external cooling (considering ambient temperature of 25°C) and down to +20°C with the support of an external chiller or fresh water source. When equipped with the Cooling Control System (option, p/n 04729-108-73), the system will automatically reduce the flow from an external chiller when full cooling capacity is not necessary.

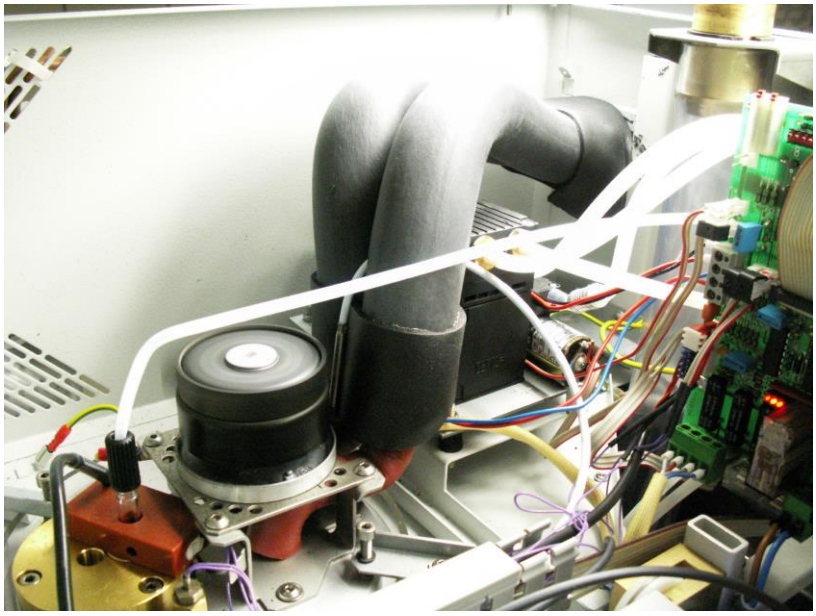
Measuring close to the dew point can be a challenge since condensation can form around the cooling pipe and can get access to the bath. This will start to make the bath cloudy over time. An even more critical task is moisture in the capillary. The HVM uses ambient air to dry the capillary after the test. In case of high humidity this can build up a moisture layer in the capillary.

To address these problems PAC has developed a modification kit:

Part No	Description
108270	Low Temperature (20C-25C) Condensation Control Kit

The kit contains a drying cartridge for the air used during the measurements, and additional insulation tubes for the cooling hoses inside the instrument.





Conclusion

The HVM472 can be used from +20°C up to +150°C even in environments with high humidity. With the low temperature condensation control kit (p/n 108270), measurements close to the dew point or below will not be impacted by moisture inside the bath or the capillary. Customers will be able to use the full temperature range of the HVM472 without getting impacted from environmental conditions.

With new units, this kit may be installed in the factory already. On existing units, the kit can be added in the field.