



ThermoStasis

What To Expect From Your Oil Thermostat

Your oil thermostat is neither an oil heater nor a refrigeration unit. The oil thermostat can not heat your oil above the temperature the oil is at when it leaves the oil tank and it can also not cool the oil below the temperature the oil is at when it leaves the oil cooler.

This means that with low ambient (air) temperatures you may see indicated oil temperatures in straight and level flight that are below the oil thermostat's nominal operating temperature. It also means that with high ambient (air) temperatures and/or sustained high power settings you may see indicated oil temperatures that are above the oil thermostat's nominal operating temperature.

If your indicated oil temperature is below the oil thermostat's nominal operating temperature it's important to remember a couple of things:

1. The oil temperature gauge is indicating the COLDEST temperature of the oil in the oil circuit. The oil temperature sender is located at the oil pump where it measures the temperature of the oil returning from the oil cooler. From the oil pump the oil flows through the lubrication galleries in the engine and gearbox where it is heated, then to the sump and then to the oil tank. So the oil in the oil tank is hotter than the indicated oil temperature shown by your gauge. The oil tank is the only location in the oil circuit where the oil circuit is vented, so it's the temperature at the oil tank that's important for boiling off oil contaminants - water and fuel.
2. It's not necessary to maintain your oil at a high temperature all the time. Rotax Service Instruction SI-18-1997 states that "*to avoid formation of condensation water in the motor oil, the oil temperature must rise at least once every operational day to at least 100°C.*" The way to achieve this is to maintain a high power setting in climb until the oil temperature approaches 100°C [212°F]. If the oil temperature then drops to, say 71°C [160°F] that's not a problem as it's well above Rotax's minimum recommended oil temperature of 50°C [122°F].

The Rotax 912 is cooled in three ways. (1) Air cooling, by air passing over the cylinders, cylinder heads, block and gearbox; (2) liquid cooling, by coolant passing through the coolant radiator; and (3) oil cooling, by oil passing through the oil cooler. The oil thermostat works by bypassing the oil cooler, so effectively temporarily removing the oil cooler from the oil circuit. If your 912 installation is well-cooled due to the airflow through the cowl and the size and placement of the coolant radiator, then the oil thermostat will be less effective than in a hotter running 912 installation with tight cowling and a small coolant radiator and small oil cooler [e.g. the Rans S-7.] If you wish to do more to raise your oil temperature, it will be necessary to take an integrated approach to raising coolant and oil temperatures which may include installing Evans NPG+ coolant, installing a coolant thermostat, reducing the size of cowl apertures, adding airflow baffles and reducing the size of the coolant radiator and oil cooler.

The oil thermostat reduces oil temperature warm-up time by about one-third. Unless you have carefully timed the before and after warm-up times you may not notice this difference.