

Low Temperature Operation

What is the consequence of operating at a low ambient temperature? The weak links are in the motor, the bearing system and the windings if water is present. Operation at low ambient temperature can lead to premature failure. At sub-zero temperatures the metal bearing parts contract and lubrication becomes more viscous increasing the resistance of rotation, possibly preventing the motor to start.

Continual operation at such low temperatures with the lubrication below its recommended temperature range could result in the lubrication breaking down causing premature bearing failure. If there is a chance of water or condensation then the motor winding could be damaged. If water reaches the winding it will get between the individual winding wires. When it freezes it will expand causing small cracks in the enamel wire insulation. This will lead to electrical short circuits between winding wires or to earth causes failure.

It is important to consider operation of motors in sub-zero temperatures. Most motors can operate in sub-zero temperatures but how far below 0°C they can operate varies between products. This and whether moisture is present needs to be considered and the design of the bearings and motor changed accordingly.