



FAQ – Baldor RPM AC™ Cooling Tower Direct Drive FAN MOTOR & VS1CTD Variable Speed Control System

Q. What is this technology and how does it drive a fan directly without speed reducers?

A. Baldor RPM AC™ Cooling Tower Direct Drive Fan Motor is a marriage of two proven technologies ... Permanent Magnet (PM) motors for high torque & compact size and Variable Frequency drives (VFD) to provide precise speed control. The standard VFD incorporates specially designed software developed for the cooling tower fan drive industry.

Q. Can I replace my current gearbox & driveshaft with a Baldor RPM AC™ Cooling Tower Motor? What about my current motor starter?

A. Yes you can directly replace your present gearbox & driveshaft with the Baldor RPM AC™ Cooling Tower Motor. For most applications, it will simply bolt to your present gear mount without modification. Your current motor starter will be replaced by the included VFD drive which will often mount close to your present starter location.

Q. Is it a good idea to operate an electric motor in the hot, moist airstream of a cooling tower?

A. In this case, yes. The motor is TEAO (Totally Enclosed, Air Over) essentially sealed with a capability of operating in a 40°C (104F) ambient temperature and a sealed Class “H” insulation. Additionally, when the motor is turned “OFF”, a DC trickle current is applied to keep the interior warm and condensation burned off, a feature that eliminates the need for internal space heaters. The motor casing also has generous cooling fins to dissipate heat. Inpro shaft seal with backup slinger helps protect from environment ingress. 100% grease fill eliminates voids and minimizes condensation damage as well as provides a grease dam assisting in sealing the system.

Q. What if the motor needs servicing or rewinding after the warranty period? Where do I take it?

A. Although the Baldor RPM AC™ Cooling Tower Motor does incorporate the latest Permanent Magnet technology, it can easily be rewound at any Reliance / Baldor service shop. The stator winding is typical of a standard induction motor.

Q. Will “windmilling” adversely affect the motor?



A. No. The automatic DC trickle current when the drive is OFF will also supply a braking force to the motor preventing windmilling. However, if DC trickle current is not applied for some reason, windmilling will not affect the motor or VFD drive.

Q. Will “windmilling” adversely affect the motor under hurricane conditions?

A. We assume that under hurricane conditions where power is lost, that gust of wind could cause a fan speed of 125% of base speed. If a motor is designed for 460Vac RMS at 100% speed, then this is a nominal bus voltage of 650Vdc. The Baldor CT drives are designed to withstand around 800Vdc on the bus. When a Baldor RPM AC™ CT motor is windmilling without any power applied from the drive, the generated voltage back to the drive is less than that required to operate it from the drive. For example: a 30HP motor operating a 12 ft fan will generate around 280Vac when rotating at base speed of 292RPM. Thus when rotating at 125% speed, the voltage being generated back to the drive is still within the design limits.

Q. If I only have a single speed motor now, why would I need a VFD drive?

A. The VFD drive is required to operate the new motor but it can be easily programmed to simply ramp to full design speed each time it starts. The advantage of the slow-start capability inherent in a VFD drive include energy saving by not having the normal inrush current typical during normal motor start-ups. This slow-start ramp will also provide less mechanical stress on the overall system and in some cases remove the need for torque tubes. Also drives have the capability to communicate with common HVAC interfaces such as BACnet, Johnson Controls Metasys-N2, LonWorks and MODBUS-RTU which can adjust fan speed based on required system load. This capability can have a major impact on energy savings and total system efficiency.

Q. What about moisture getting into the bearings?

A. The very latest **Inpro VBXX** seals and a shaft slinger are incorporated into the drive-end shaft to minimize contamination ingress. The bearing cavities are lubricant-packed 100% to eliminate voids and minimize condensation contamination. There is only one entry point for contaminants with this design, not two as is standard for gearboxes.

Q. Can I use a general purpose AC Drive to control this motor?

A. The Baldor CTD Drive utilizes a unique, custom firmware for optimal control of the Cooling Tower Motor and is power matched for the Permanent Magnet Technology.

Q. What kind of warranty is offered?



A. For HVAC applications, a full 5 year warranty applies to both the motor and VFD drive. For Industrial or Power Generation applications, 3 years will be the standard.

Q. What about motor lubrication frequency?

A. Standard 12 month re-lubrication cycle on both bearings.

Q. Is there a danger of the VFD overdriving my fans to speeds higher than rated?

A. No. The VFD drives are torque-limited thus preventing over speed but additional measures also prevent this since excessive fan speeds would also require excessive drive current. Each VFD drive has built-in electronic motor overload detection which will immediately shut down the unit in the event of over-amperage.

Q. Can I use my current BMS software with this new motor?

A. Yes. The Baldor VS1CTD Cooling Tower drives are fully compatible with all popular communication protocols.

Q. What kind of vibration monitoring options supplied with motor?

A. Each motor is supplied with a vibration pad which is used to attach a vibration switch. This would be the same as what is used on the present day gear box solutions.

Q. Does this solution have soft start capabilities?

A. Yes the package has soft start capabilities which ramp up the speed slowly from stop to full speed / load. This feature minimizes impact stresses to the tower structure and mechanical components.

Q. If I have a bank of 4 towers can I use one drive to run all four towers?

A. The Baldor Cooling Tower Direct Drive Motor solution requires one drive for each motor.

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