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Subject: New Software for the Adaptive Capacity Control Board		

Background

The software currently in production for the Adaptive Capacity Control (ACC) Board contains a new soft ramp-up, and requires a slight Control Center adjustment for proper operation.

Units Affected

All YT and YK chillers with OptiSpeed Compressor Drive manufactured from November of 2002 to present production.

New Features

The new software for the ACC board will reduce the power required to bring the compressor speed up to catch the load of the customer's chilled liquid loop, without the requirement of running the compressor up to full speed. The version number of the new software is C.ACC.01.04. The part number for the new software is 031-01674-002. The part number for the software did not change.

Many times a lightly loaded chiller will operate in a stall condition. When the chiller is in stall, the ACC determines that the chiller is not stable, and will not slow down the OptiSpeed Compressor Drive. The software in the ACC has been modified to reduce the chances that the chiller will enter stall within the first 5 minutes of chiller run time. The new software will slowly accelerate the drive during the ramp-up of the compressor motor. The drive will accelerate the motor to 30Hz in 22 seconds (25Hz for 50Hz application). Then the drive will accelerate the compressor motor to full speed over the next 5 minutes. During this time, the pre-rotation vanes will open to pull down the chilled liquid loop. If the leaving chilled liquid temperature setpoint is satisfied during this time, then the drive will not accelerate to full speed, but will start to slow down from the frequency at which the setpoint is satisfied.

Additional software was added to reduce surging during the ramp-up period. If cool condenser water is not available at the time the chiller is started it may surge. If during the 5 minute ramp-up period the ACC determines that the compressor has surged 2 times, then the new software will accelerate the drive to full speed at a rate not to exceed 22 seconds. The new software will perform as previous version after the first 5 minutes of run time.

Overload Problem

While the ACC is still running in the slow ramp-up period the OptiSpeed Compressor Drive may run into an overload condition. With the pre-rotation vanes at a position of greater than 80%, the current output of the OptiSpeed Compressor Drive is rising faster then the pre-rotation vanes can close to lower the output current. The higher output current will cause the OptiSpeed Compressor Drive to protect the compressor motor and shutdown the chiller.

Adjustment Required

A simple adjustment of the Pull Down Demand can solve this problem. Program the Pull Down Demand for 80% of rated Full Load Amps, and set the time for 5 minutes. This adjustment will prevent the OptiSpeed Compressor Drive from shutting down the chiller from an overload condition during the slow ramp-up period.