Small Tonnage Chillers
Variable Evaporator Flow Recommendations

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INTRODUCTION

Historically, York has not published recommendations for variable evaporator flow recommendations, since small tonnage chiller systems have been traditionally based on constant liquid flow.

Small tonnage chillers have been growing in popularity and are being alternately considered on more applications, where larger tonnage water-cooled centrifugal or screw chillers have been used. Thus, there has been increasing customer interest in variable evaporator flow for small tonnage chillers.

VARIABLE EVAPORATOR FLOW RECOMMENDATIONS

Variable chilled liquid flow can be satisfactorily applied to air or water-cooled screw small tonnage chillers (i.e. YCAS, YCWS, YCRS, YCAL, & YCAR). These chillers incorporate LWT (leaving chilled water temperature) control as standard, which is needed for this type of duty.

It is recommended that the total available minimum water volume be 8 to 10 gallons per chiller ton (8.6 to 10.8 liter per cooling KW) for a variable flow type of application.

This will allow control algorithms in the microprocessor to minimize compressor cycling and promote chilled liquid temperature control. A gradual change of about 10% in flow rate in 5 minutes can be accommodated. (It would be even more conservative, if this would be limited to 10% change in flow rate in 10 minutes.) If the water volume is less or flow changes abruptly, compressor cycling and leaving liquid temperature fluctuations can occur. Variable flow in process applications where large load changes occur is not recommended, if stable temperature control is required.

When variable flow is applied in an application, the evaporator flow should not be allowed to go below either the minimum or above the maximum published values in the chiller engineering guide.

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