Selecting the proper chiller barrel for your application depends on four basic sizing considerations:

Range

The desired temperature drop of the fluid measured as the difference between incoming and outgoing fluid temperatures.

Approach

The desired temperature difference between outgoing fluid and the refrigerant evaporating temperature.

Pressure Drop

Acceptable level of fluid pressure drop through the chiller barrel at computed gallons per minute (gpm) flow rate.

Capacity

Necessary heat removal (tonnage) at maximum operating load

Determine the range and approach then obtain the StanrefPro selection and rating software at our website www.stanref.com.

Chiller barrels may be sized by other methods as well. Where the desired temperature range is known (difference between incoming and outgoing fluid), determine the Btu/hr capacity needed by multiplying the temperature range by gpm flow and convert to pounds of water per hour using the multiplier 500.

Range x gpm x 500 = Btu/hr

Another sizing method is by compressor capacity. Manufacturer curves showing compressor Btu/hr values serve as a simple guideline for selecting chiller barrels for a given system.

Also, Standard chiller barrels are rated to ARI standards and can be selected on a nominal system tons basis using the capacity charts in this catalog. This method, however, is recommended only for high temperature (air conditioning) systems.

Fluid Nozzle Location (Shell and Tube only)

The standard fluid nozzle location is on the right as you are facing the refrigerant connections. Special top, and left side connections can be ordered.

TX2 through TX20 have top side nozzle location as standard.

Technical Assistance and Custom Designs

Standard offers custom design services and computer performance projections on all heat exchange products to help you match product and application accurately. You are invited to contact your nearest sales representative or our office headquarters for prompt assistance.

Note on Refrigerant R410a Applications

Due to the high working pressures of Refrigerant R410a. Any Chiller Barrel product in our catalog must be customized to conform to ASME construction. Please contact customer service for quotation.

Sizing the Right Evaporator (Chiller Barrel)

Sizing by Nominal Tons

There are three basic selection methods you can use to size a chiller barrel. The first and easiest is to size by nominal system tons. The second method is to use compressor capacity. The third and recommended method is sizing by range, flow and approach.

Sizing by nominal tons is done according to ARI standards. Chiller barrels can be selected on a nominal system ton basis, as shown in the catalog model specifications, or it can be reflected in the model name. For example, a TXC50-2 is a nominal 50 ton dual-circuit chiller barrel.

Nominal ton ratings are based on the conditions of ARI Standard 480 utilizing R-22, which are:

54 degrees F water in

44 degrees F water out

35 degrees F refrigerant evaporating temperature 7 degrees superheat

0.0001 additive fouling factor

100 degrees F liquid refrigerant entering the flow control

This method is reasonably accurate for sizing air conditioning systems, or high back pressure systems. However, it is not recommended for evaporating temperatures below 34 degrees F, or when the fluids used are other than water and R-22.

ARI standard

· 54°F water inlet

· 44°F water outlet

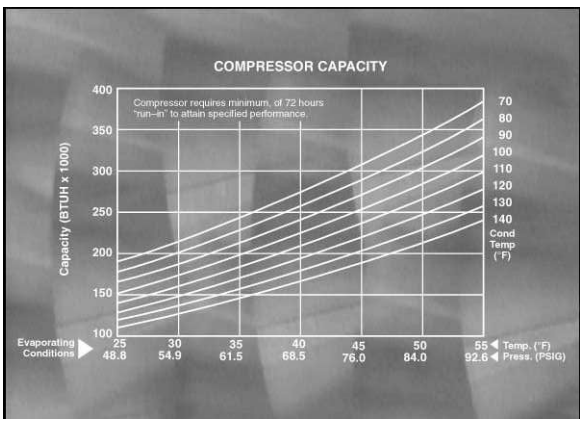
· 35°F water inlet

· 7°F superheat

· 0.0001 additive fouling

· 100°F liquid refrigerant

Sizing by Compressor Capacity



You may also size by compressor capacity. Compressor manufacturer performance data of Btu per hour can be used to select chiller barrels for a given system. By reading the performance curves of the compressor at the conditions that you require, you can determine the maximum capacity chiller barrel you will need.

Sizing by Range and Flow

The most precise way to size a chiller barrel when water is used is by the range and flow rate as seen in the formula:

Btu/hr capacity = Range x gpm x 500

Btu/hr capacity

=

Range x gpm x 500

To obtain the Btu per hour capacity, just multiply the Range or Temperature Drop by gpm flow, and convert to pounds of water per hour by multiplying by 500. The Btu's can then be divided by 12,000 to yield the tons of load.

With an incoming water temperature of 55° F., outgoing water temperature of 45° F., and a 479 gpm water flow. Btu capacity can be calculated like this:

(55° - 45°) x 479 gpm x 500 = 2,395,000 Btu/hr

2,395,000 Btu/hr (divided by)
12,000 Btu/ton = 199.5 tons

In cases where the fluid being cooled is other than water, capacity can be determined by adding the

specific heat and specific gravity into the equation: Btu/hr = Range x gpm x 500 x Sp Heat x Sp Gravity

This equation will give you the capacity required, but chiller selection should be made by your factory representative since the fluid is not water.

All of the Standard rating data is based on ARI standards, a suction temperature 35° F, using water as the fluid. Contact an Alfa Laval representative for special fluid conditions.

All heat exchangers have capacity limits. Careless sizing of chiller barrels leads to needless performance problems.

Undersizing can lead to insufficient cooling and inefficient compressor operation.

Oversizing can lead to control valve hunting, poor performance, oil logging, and refrigerant slugging.