

Which Type Compressor to Use?

Choosing the proper compressor for an application involves a number of decisions. Here is a guide to some of the basic questions that must be answered.

HD Series Compressors				
Single-Stage Air Cooled			Two-Stage Air Cooled	
Single Seal	Double Seal	Triple Seal	Double Seal	Triple Seal
HD161 HD361 HD601	HD162 HD362 HD602 HD942	HD163 HD363 HD603	HD172 HD372 HD612	HD173 HD373 HD613
Single-Stage Water Cooled			Two-Stage Water Cooled	
---	HDL342	HDL343	HDL372	HDL373
---	HDL362	HDL363	HDL612	HDL613
---	HDL602	HDL603		
---	HDL642	HDL643		
	HDL942			

HD Series Compressors

The HD series compressors are designed to meet the increased demands of general industrial use. All of these models feature larger, heavier-duty valves, thicker piston rings, and a greater range of options than our LP-Gas compressors.

Single-Stage or Two-Stage?

The proper number of stages to use is generally determined by the compression ratio (discharge pressure divided by suction pressure). In most cases, single-stage compressors are used when the compression ratio (C_R) is less than 3, and two-stage units are used when C_R is greater than 6. C_R values between 3 and 6 require consideration of factors such as C_R variance, duty cycle, and discharge temperature to determine whether a single-stage or two-stage compressor should be used.

A typical liquefied gas transfer compressor operates at a C_R of 1.1 to 1.5 during the liquid transfer operation and will reach a value of 4 to 5 at the end of the vapor recovery phase. A single-stage compressor is the obvious choice for this application. Other applications may have a much wider range of C_R s which will require a complete understanding of the process to arrive at the most appropriate solution.

Air-Cooled or Water-Cooled?

High temperature is the bane of many compressor applications and water-cooling is one tool for dealing with this problem. A water-cooled version will generally outwear the air-cooled version of a compressor in a given application as it will operate at a lower temperature. Alternately, water-cooling may be used to expand the performance envelope of the air-cooled version (operate at higher compression ratios). On the other hand, water-cooling adds complexity and cost.

How Many Seals?

The seals on the piston rods control the amount of leakage and contamination of the product being compressed. The more seals, the greater the ability to control these factors. The choice of the number of seals is determined by a combination of customer preference, the gas being handled, and regulations that may govern the installation.

Traditionally, LP-Gas and NH₃ bulk plants have used single-seal models although double-seals are becoming more common. Applications involving air boosters, nitrogen, Freons, sulfur dioxide, carbon dioxide, etc. typically use double-seal models. Products like vinyl chloride and chlorine almost always require triple-seals. The trend has been to use more seals and more elaborate systems involving purge gasses.

Which Size Compressor?

While determining the required compressor capacity is generally a straightforward process, picking the actual compressor may involve some subjective decisions. Usually the choice is between a larger, slower running compressor or a smaller, faster speed unit. Occasionally, the choice may involve one large compressor versus two (or more) smaller versions. An accurate description of the expected duty, operation cycle and determination of the discharge temperatures will provide guidance as to how conservatively the compressor should be sized.