



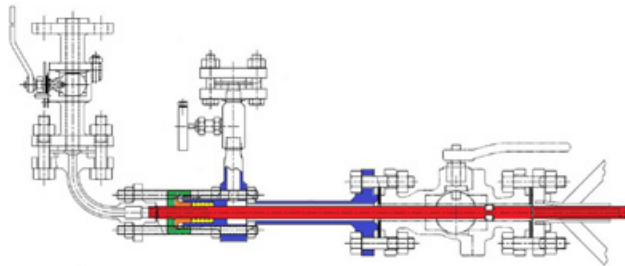
Liquid Injection Systems Data Sheet

Liquid injection systems reduce or eliminate fouling. Elliott manufactures two types of liquid injection systems – wash oil and water. Both systems use a series of filters, pressure-regulating valves, and spray nozzles that inject wash fluid – oil / naphtha or water – between the diaphragms in a compressor casing to reduce or eliminate fouling. Oil dissolves the foulant and protects the internal compressor components from foulant buildup. Water cools the temperature of the process gas to prevent the accumulation of foulant.

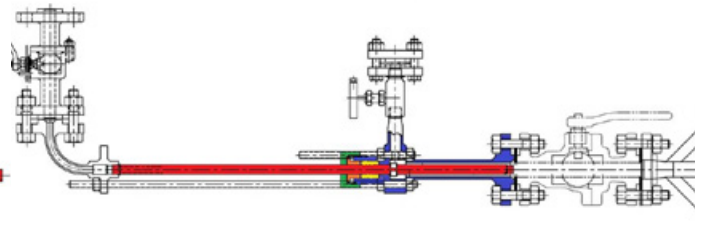
The proper system is selected based on the compressor process, and each system is customized to meet a customer's specific requirements.

Wash Oil and Water Injection Nozzle Systems

Wash oil and water injection nozzle assemblies can be removable (retractable) or fixed (non-removable or non-retractable). To prevent loss of process gas after the spray nozzle lance is removed, the integral ball valve is closed on the removable nozzle. A fixed spray nozzle assembly is bolted to the casing connection flange.



Removable nozzle in the installed position.



Removable nozzle in retracted position.

Removable Nozzle Assembly	Fixed Nozzle Assembly
<ul style="list-style-type: none">♦ Can be removed for maintenance while the compressor is operating♦ Eliminates the need for unnecessary outages♦ Recommended for maximum process operation	<ul style="list-style-type: none">♦ Results in lost production time due to compressor shutdown during system installation or repair♦ Incurs costs associated with unplanned outages for fixed nozzle system repairs♦ If a nozzle requires maintenance but the equipment cannot be shut down immediately, the effectiveness of the system is greatly reduced.

Wash Injection System Sizing and Selection

Elliott designs each wash injection system to meet specific system requirements and flow rates. Every system is sized for a specific pressure, temperature, and flow rate.

Elliott requires the following information to design a liquid injection system:

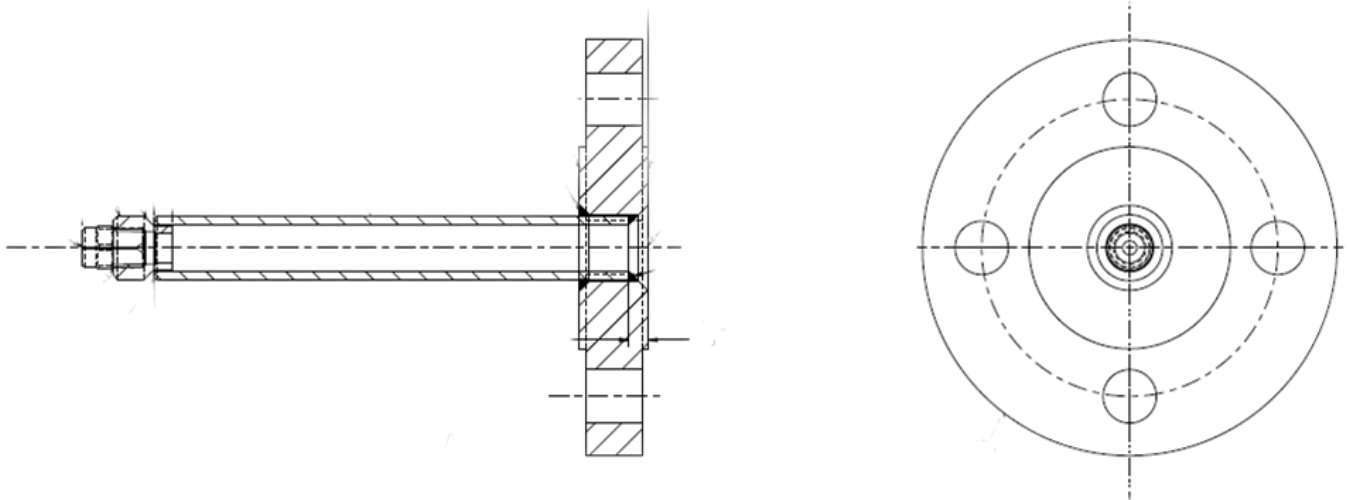
- ♦ The type of wash fluid to be used (oil, naphtha, water, etc.)
- ♦ Pressure, temperature, and quantity of the available wash fluid
- ♦ The number of compressor stages and the number of spray nozzles
- ♦ Removable or fixed lances
- ♦ Area classification
- ♦ Instrumentation requirements
- ♦ Location of the installed equipment

The following are basic design considerations for Elliott wash oil and water injection nozzle systems:

Pressure	<p>Wash fluid supply pressure must be 160 psi above the desired discharge pressure:</p> <ul style="list-style-type: none"> 50 psi drop across the skid 10 psi drop for piping losses 100 psi drop across the nozzles
Temperature	Design specifications tailored for both low and high temperature applications
Flow Rate	<p>Maximum flow is 85 gpm</p> <p>The flow rate to each stage is set using a needle valve and flow indicator</p>
Materials	<p>304 stainless is standard</p> <p>Other materials available upon request</p>
Equipment	<p>Additional valves as required</p> <p>Filtration is typically 50 to 100 microns; more stringent filtration available as required</p> <p>Other possible upgrades such as fully automatic flow control using control valves, pressure relief valves, and flow transmitters</p>

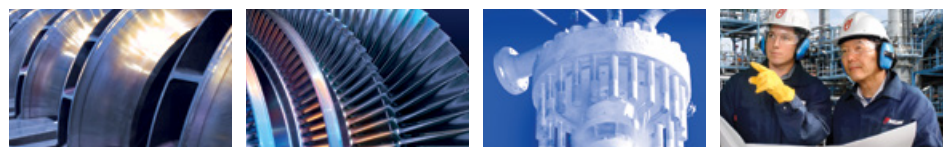
Atomizing Spray Nozzles

Elliott uses atomizing spray nozzles on all liquid injection systems to ensure that the wash fluid is injected as a fine stream of droplets. Smaller droplet sizes reduce the risk of mechanical damage to compressor components and increase the water injection evaporation efficiency.



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