

Differential Pressure

Differential pressure is the pressure increase provided by the pump between the pump inlet and outlet. It is measured as the difference between the pressure at the pump's discharge flange and the suction flange.

At a given flow rate, impeller diameter and rotational speed a centrifugal pump will produce a specific differential pressure (or head). This differential pressure is unaffected by inlet pressure. E.G. If the inlet pressure is raised to 100 PSI, outlet pressure becomes 130 PSI, but the differential remains 30 PSI.

The required differential pressure is determined by evaluating all pressure (or head) losses from the liquid level in the receiver through all piping and components of the system and back to the receiver. These calculations are carried out for any design or expected flow rate through the system. The differential also includes the pressure equivalent of any net vertical distance between the receiver liquid level and the highest evaporator element. Furthermore, additional differential pressure must be added into the total to overcome the difference between the saturation pressure of the refrigerant at the pumping temperature and the pressure in any coil that is being held at higher pressure via a "back pressure regulator."

Finally, the following formula may be utilized to convert PSID into HEAD [feet]

HEAD [feet] = PSID x 2.31/SPGR, where SPGR = Specific Gravity.

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