ALTITUDE EFFECT ON THE OPERATION OF LIQUID RING VACUUM PUMPS

Performance curves for vacuum pumps are always derived relative to atmospheric pressure at sea level. When a vacuum pump operates at altitudes higher than sea level the atmospheric pressure decreases. The important thing to remember when you encounter applications at altitude is to measure the vacuum level relative to barometric pressures. Please see the example below to see how this affects the calculation of vacuum level. As a quick rule of thumb, you can assume that for each increase of 1,000 feet of elevation, the barometric pressure will decrease by 1" Hg.

Example:
The installation site is located in Denver, CO (elevation - 5,000 feet). A capacity of 750 ACFM at 20" Hg gauge is required for the application. The question is: what is the equivalent vacuum level at sea level.

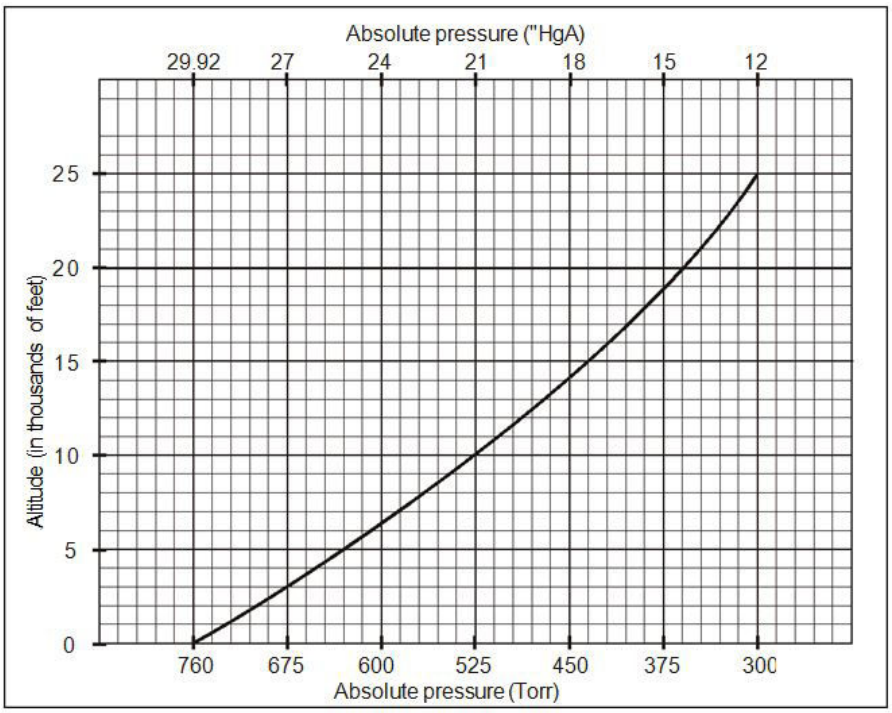
Solution:
Use the following formula to calculate equivalent vacuum level.

$P_{ref} = P_1 \times (29.92 / P_2)$ in which

P_{ref} = corrected vacuum level
P_2 = barometric pressure at ___ altitude = 25.3" HgA (from chart)
$P_1 = P_2$ required vacuum level at altitude = 25.3" HgA 20" Hg = 5.3" HgA

P_{ref} = 5.3"Hg x (29.92/25.3) = 6.3" HgA or 23.4" HgV (29.92 - 6.3)

Therefore, select the pump with a minimum capacity of 750 ACFM at 23.4" HgV.



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