

GARDNER DENVER L-BL2 CLOSED CIRCUIT LIQUID RING VACUUM PUMP



SITE REVIEW

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After almost 11 years in the vacuum pump industry, it was like going to vacuum pump post-secondary school at this customer. I majored in liquid ring vacuum pumps with oil rotary vane vacuum pumps as my minor!

Over this time the chicken and meat industry have been my focus, with a lot of success in the chicken process area (evisceration). This mainly involved liquid ring vacuum pumps (with both water and oil as service liquids) as well as the after process (vacuum packing of chicken and meat). In addition, I supplied oil lubricated rotary vane pumps for vacuum packaging applications dealing with food grade oil versus synthetic oils for de-centralized versus centralized vacuum systems.

On the evisceration side of the business, the processing plants are generally located in smaller municipalities outside of the Greater Toronto Area. They have traditionally used well water or local city water as a service liquid for their liquid ring vacuum pumps. The problem is that this city water is hard (water that has high mineral content) and causes scaling issues inside the liquid ring vacuum pumps which lead to reliability issues, ongoing repairs, downtime and eventual replacement. Not even a 316 stainless steel pump construction can stand up to “hard water” in my experience and the only solution to this is to get off the local city water or well water with high levels of lime.

In addition, with the recent introduction of so called “smart” water meters, local municipalities have transferred much of their administration costs, from the homeowner to the manufacturing sector, for both water in, as well as water that goes down the drain (waste water treatment cost). Water is a precious commodity, even in Canada and very costly to chicken and meat processing operations as they constantly have to wash down their processing equipment regularly for sanitary purposes.

Tumbler Processing

Our customers’ production area appeared exceptionally dry and very clean and orderly. According to my contact, Brandon, the customer used to use oil sealed rotary vane vacuum pumps in the tumbler section that were supplied by a well-known international vacuum pump manufacturer. These oil-sealed vacuum pumps have been replaced with Elmo Rietschle vacuum pumps supplied by CompreVac. These pumps are manufactured in Germany by German craftsmen using the finest materials. They are definitely built to last. Elmo Rietschle is owned by Gardner Denver/Ingersoll Rand, arguably one of the largest pump builders in the world. At this plant, the Elmo Rietschle vacuum pumps were located right at the side of the tumblers. This vacuum pump is known affectionately as, “The Pump-in-a-Box”. The models supplied to date at this plant incorporated either 4.7hp or 9.7hp motors. These remarkable pumps are closed circuit, liquid ring, self cooling vacuum pumps. The cooling and sealing water is contained within the outer polymer jacket.

I have often observed in other meat processing plants, oil sealed rotary vane vacuum pumps supplied by the same or similar international manufacturers on tumbler systems. Often, it is a sad picture of copious misting vapour surrounding the pumps, as water vapour coalesces from the exhausts. The exhaust filters are usually clogged because of the high moisture content, and there is always a litany of bearing failure, greater maintenance costs, downtime, as well as frequent replacement. Even with food grade oil in the sumps of these pumps, the oil mist remains a health hazard to the employees. Furthermore; who wants food grade oil added to the product?

Additional Positives Witnessed in Tumbler Department

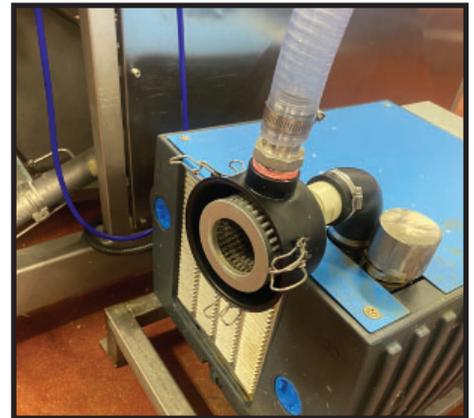
The customer has raised the Elmo Rietschle 2BL closed circuit liquid ring vacuum pump units off of the production floor by mounting them on 316 stainless steel mounting frames. This modification allows any water/humidity sucked into the pump, to automatically discharge to a suitable floor drain. This positive refinement also ensures all around external air cooling and aids the washdown procedure. I advised the customer that they may wish to add locking castors which is often observed in the plastic extrusion industry to aid the portability of these exceptional Elmo Rietschle vacuum pumps. We can also add 316 stainless steel access covers to the pumps which is always a wash-down favourite addition.

Water Supply - The customer is periodically using city water to fill up his Elmo Rietschle 'Pump-in-a-Box' vacuum systems. I recommend that in future, he may want to consider using reverse osmosis water. The larger pump has a cooling water capacity of 20 us gallons.

Should the customer decide to continue using city water, I recommend that they purge the water monthly and add a small amount of citric acid. I was pleased to learn from the customer that he rarely needs to top up the sealing water jacket however, this will not be an issue in the future as he has decided to install an F-52 upgrade. The F-52 is a mechanical sealing water inlet regulator, (just ordered). I advised him of the benefits of also adding a F-53, which is a mechanical seal water outlet regulator. This is a great upgrade to counteract for the additional humidity of our Ontario summer months that can add to the vapour content in the tumblers. The excess water discharge can then be piped directly to a suitable floor drain.

External Inlet Filter Requirements in Tumbler Section - Customer has built in STS filter type external filters on the tumbler prior to the 4.7 HP 2BL unit, which currently has external inlet filters with Polyester Particulate Filters as well as replacement Polyester Elements which should be replaced every 6 months as part of a PPM (Planned Preventative Maintenance) program instead of being cleaned with compressed air which is not an effective maintenance method.

In my next Vacuum Audit # 2, I will discuss the possible replacement of the Oil Lubricated Rotary Vane Vacuum Pumps in the after process/vacuum packaging lines.





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