

RECOMMENDATIONS FOR TANK/SCRUBBER MANUFACTURERES UTILISING VERTICAL CENTRIFUGAL PUMPS.

Tank/scrubber outlet (pump suction line)

NEVER restrict the suction line of the pump! Always design your tank/scrubber sump outlet at least one, but preferably two pipe diameters larger than what is required by the pump i.e. if the pump requires a 100mm suction line, then make it 125 or 150mm. This is to reduce or eliminate friction losses that are caused by, Isolation Valves, Non-return valves, strainer baskets and right angled bends, as well as, abnormally long suction lines etc. This is important because a Centrifugal pump is not sucking, but rather a pushing device and it can only deliver what is allowed into the suction port. Always install an isolation valve in the Tank/Scrubber outlet (suction line of the pump) as close to the tank as possible. This will facilitate possible future alterations to the suction pipe work.

In a "Duty/Stand-by" scrubber installation, where Vertical Seal-less pumps are utilised, non-return valves should be installed in the suction lines approximately 300 to 500mm below the pump, this is to facilitate the automatic change-over from one pump to the other.

Delivery line.

The delivery line connected to a Vertical Seal-less pump, can be substantially reduced if need be, without incurring any damage to the pump. However, it may significantly reduce the flow-rate and increase the delivery pressure.

In a "Duty/Stand-by" Scrubber installation, always install Isolation valves, in each of the delivery lines, as close to the pumps as possible, as well as non-return valves, between 1 and 2 meters further along the Delivery line, or, at least before they are joined together. This is to prevent fluid from the running pump, entering the stand-by pump, causing it to leak out of the Vapour seal between the motor and the upper body of the pump. Try and keep right angled bends to a minimum, and always install good quality pressure gauges and flow meters that have been correctly calibrated.

The Overflow line.

The overflow line on Vertical Seal-less Pumps can be connected directly to the supply Tank at the Max liquid level (preferred), or to a "Stand-pipe" which is connected to the suction line, again at the Max liquid level of the Tank/Scrubber Sump. A stand-pipe should not be used if the NPSHa is low! i.e. a long suction line, or other obstructions to the suction line, and, if the delivery is throttled back for long periods of time. If a Stand-pipe is utilised, always make sure that it is, as a minimum, the same diameter as the Suction Line, or bigger. This is to prevent liquid being pushed out of the stand-pipe too quickly, and pulling air into it, resulting in the Pump losing prime. In a "Duty/Stand-by" Scrubber installation, the overflow lines of the two pumps, should be connected together, and then joined to the Tank or Stand-pipe via a tee piece, ensuring that the over-flow path of both pumps are free and clear from obstruction, to each other, and to the Stand-pipe. This is essential for automatic change-over, as the running pump, keeps the Stand-by pump primed at all times via the overflow line, irrespective of the liquid level in the Tank/Scrubber sump. It is also recommended that if non return valves are used in the suctions of the duty/standby self priming installation as described above, the pumps should be installed, such that the overflow branch is approximately

4-6" above the max liquid level of the scrubber sump, and that a water line is connected to the suction line, just below the suction flange of, at least one of the pumps, to facilitate initial priming. This small head of liquid above the max liquid level of the sump, should be enough to keep the non return valve on the "off" pump closed, and thus primed. A "Witches Hat" non return valve could be a good option for this type of installation! Obtainable from: Northvale Korting LTD TEL: 01162 610 050. Email: sales@northvalekorting.co.uk

Scrubber sump design recommendations

(1) Always fit a level indicator to a scrubber sump. It could be as simple as a clear tube. It is important to be able to see what the sump level is at any given time during operations, because a strong fan could raise the liquid level quite considerably and easily cause a standby pump to "leak" out of the vapour seal when it is off. If the fan causes the level to rise above the overflow branch of the Vertical Pump, it will most certainly leak! To remedy this, drain the excess liquid from the sump until it is just below the overflow branch while the fan is running, switch the fan off, and readjust the max liquid level probe to the new lower height.

(2) Always fit a safety drain to the sump, approx the same diameter as the Pump overflow. The centre-line of the drain pipe should be approx 1.5 x the diameter (from the centre line of the pump overflow branch) of the overflow branch of the Pump. Any excess liquid will drain away before it starts to leak out of the vapour seal.

(3) Always fit the sump with an outlet port of at least one or preferably two pipe diameters larger than is required by the pump! It is easy and cheap to reduce if necessary but expensive and difficult to increase at a later time. If you would like to discuss any of the recommendations above, please call Mark at 07952789208, or email: mark@kestnerchemicalpumps.co.uk