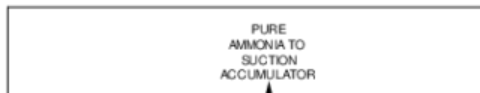


The Phillips Anhydrator operates as a self-regulating still to remove water, oil, and other impurities from ammonia. Because the unit uses heat from high pressure liquid, thereby subcooling it, the unit is essentially energy neutral. Due to its unique self-regulating capability, the unit can be allowed to run indefinitely without draining the accumulated impurities until a time that is convenient for the operator. Installing the Anhydrator as outlined in this bulletin will ensure low system operating costs with minimal maintenance.

Inside the Anhydrator, cold impure liquid ammonia (typically taken from the pump discharge) is exposed to heat from the high pressure receiver liquid. (Refer to Figure 1.) The warm and cold streams do not mix. The cold impure liquid ammonia boils, and the resulting pure ammonia vapor is returned to the pump accumulator. After giving up some of its heat, the liquid from the high pressure receiver also goes to the pump accumulator. Because this liquid is now subcooled, the reduction in flash gas at the accumulator roughly balances with the pure ammonia vapor mentioned earlier. Depending on the suction pressure of the system, the liquid collected in the Anhydrator ultimately becomes a mixture of up to about 70% water, 30% ammonia, and other impurities. (It is not practical to remove all the ammonia from the water.) As a rule, the greater temperature difference between the hot and cold liquid streams, the greater the effectiveness of the Anhydrator. The impurities collected in the Anhydrator are drained from the bottom of the unit and disposed of according to local regulations.



(Unit shown with 300HM-GZB Float Valve)

## APPLICATION

Inside an ammonia system, water travels with liquid ammonia and accumulates in the lowest temperature area of the system, such as pump accumulators and flooded chillers. Connecting the Anhydrator to these locations allows water and other contaminants to be safely and effectively removed.

Figure 2 is an example of how the Anhydrator may be integrated into a basic pumped liquid recirculation system. Here, a small amount of contaminated liquid is taken intermittently from just downstream of the pumps. Ammonia vapor in the Anhydrator returns to the accumulator, while the impurities are left behind. Connecting the vapor connection back to the suction accumulator or a wet suction line maintains a low pressure condition inside the Anhydrator necessary for maximum separation. The Anhydrator's self-regulation prevents liquid from returning through the vapor connection due to boil-over.

