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ASPEN PUMPS

aspennews

[reduce returns]

guidelines for correct and incorrect installation

Please forward the attached sheets to your customers...
and educate them for the new season!

Please see the following pages...

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Guidelines

correct installation of Discharge Hosing

In order to fully understand the operation of these pumps, it is necessary to understand some of their basic principles of operation :

All minisplit piston pumps share some common characteristics:

1. They are self priming.
2. They are water cooled.
3. They are water lubricated.

This means that when they are activated, they will self prime, however during this initial period they will suck in air and while this is happening they will be running both hot and dry.

Because of this, they will emit a clicking noise which is entirely normal during the initial start up phase only, (usually around 10 seconds or less) and this will stop when all of the air in the pump intake has been purged and the pump becomes cooled and lubricated by the water flowing through it.

IF the clicking noise is heard while the pump is operating after the initial start up has been completed, this is an abnormal situation and indicates that there is a problem in that the pump is running without cooling or lubrication and is overheating.

This usually occurs in a split pump because the intake hose, i.e. the ¼" clear vinyl hose between the reservoir and the pump has emptied itself due to a siphoning effect created by atmospheric pressure.

Therefore it is vital that the intake hose is kept full of water at all times so that no air is present for the pump to suck in when it starts operating. As long as the intake hose remains full of water, every time the pump starts up it is immediately cooled and lubricated by the water flowing through it and will operate as designed, with minimal noise.

Each pump is fitted with a thermal overload protector which will deactivate it in case of overheating, however once it cools down it will begin to operate again, and if the pump is allowed to continue to operate for a sustained period of time in this condition, it will overheat, seize up and destroy itself.

In some applications, the vertical distance between the reservoir and the pump can be up to 6 feet and, obviously, the longer this distance, the longer the pump will have to operate hot and dry before it evacuates the air from the intake tube and, therefore, the longer time it will have in which to damage itself.

If the end of the discharge hose is lower than the level of the drain pain in the evaporator, the weight of the water in the discharge hose, plus atmospheric pressure on the water in the drain pan will cause the water to continue flowing, **even after the pump has switched itself off,** until all the water in the system has evacuated itself.

This is similar to the siphon effect one creates when sucking petrol out of a petrol tank in a car, i.e. once you start the initial siphoning effect by sucking on the hose the contents of the tank will continue to flow out as long as the discharge end is lower than the fluid level in the tank. The flow will continue until the tank is empty or until the end of the discharge hose is lifted up to the same level or higher than the fluid in the tank, at which point the atmospheric pressure equalizes and the siphoning effect stops.

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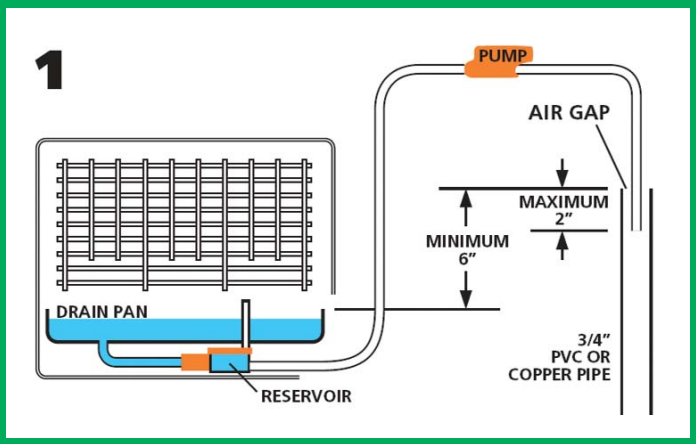
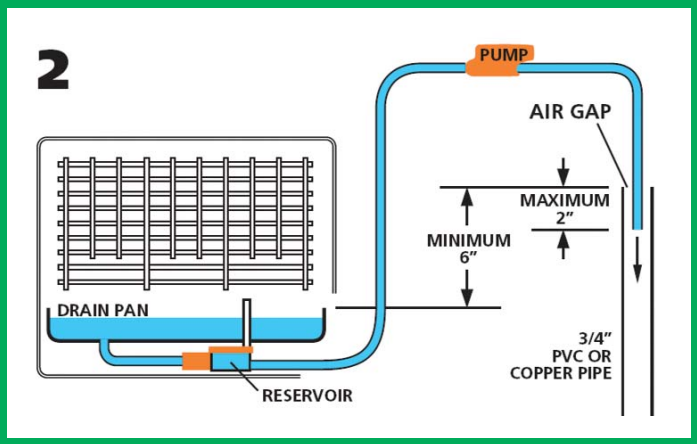
CORRECT Discharge Hose Installation

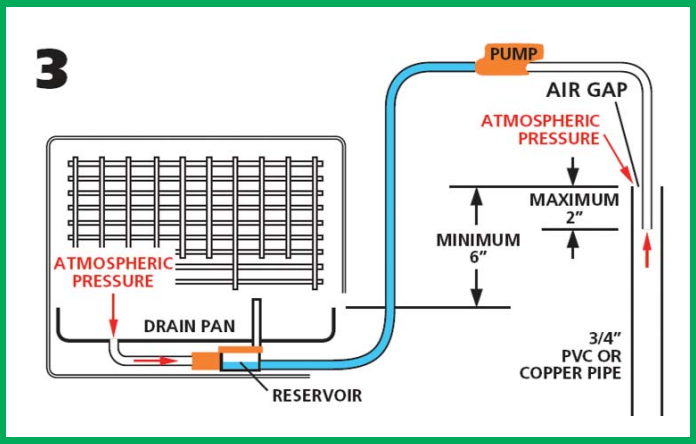
Typical Sequence of Operation



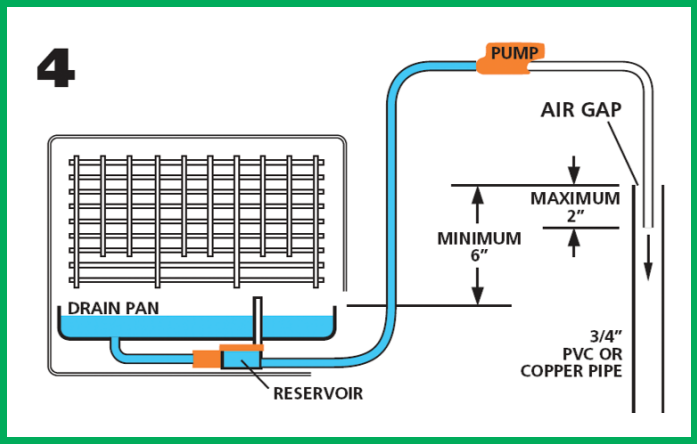
Drain pan fills up with water which flows into reservoir. Intake hose between reservoir and pump is empty i.e. filled with air.



Rising water lifts float, activating the pump, which self primes sucking water up from reservoir. During this period the pump is operating hot and dry and will click loudly. Once the air in the intake hose has been purged, water entering the pump cools and lubricates it so that the clicking noise becomes a low hum. Water flows through the pump and out the discharge hose.



Water level in the reservoir has now receded enough to lower the float which deactivates the pump, however, since an air gap is in the discharge hose, atmospheric pressure is equalized at both ends of the hose system so the siphoning effect cannot occur and THE INTAKE HOSE REMAINS FILLED WITH WATER.

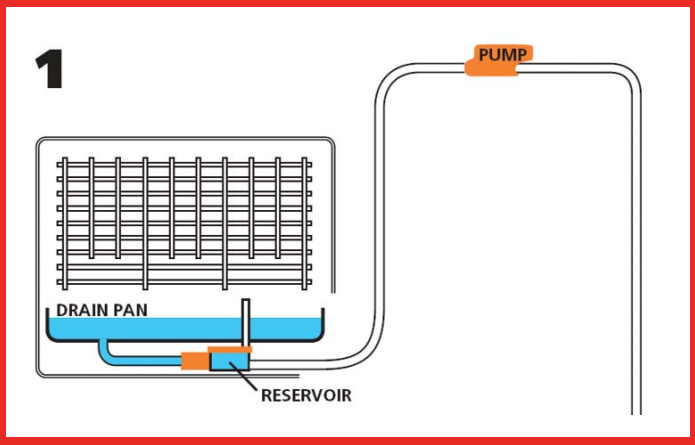


The drain pan again fills up with water which flows into the reservoir and activates the pump. THE INTAKE HOSE IS ALREADY FILLED WITH WATER so no air is sucked in, and the pump is immediately cooled and lubricated.
No clicking noise is heard.

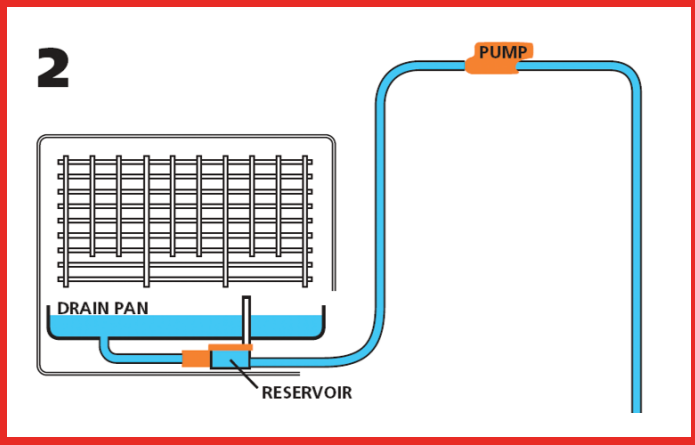
THE PUMP IS NOW OPERATING ENTIRELY WITHIN NORMAL PARAMETERS AND IS IN NO DANGER OF OVERHEATING OR SEIZING UP. NOTE: THIS APPLIES ONLY TO INSTALLATIONS WHERE THE POINT AT WHICH THE CONDENSATE WATER EMERGES FROM THE DRAIN HOSE OR PIPE IS BELOW THE DRAIN PAN IN THE EVAPORATOR. IF THE END OF THE PUMP DISCHARGE HOSE OR PIPE IS ABOVE THE LEVEL OF THE DRAIN TRAY IN THE EVAPORATOR NO SIPHONING CAN OCCUR AND AN AIR GAP IS NOT REQUIRED.

INCORRECT Discharge Hose Installation

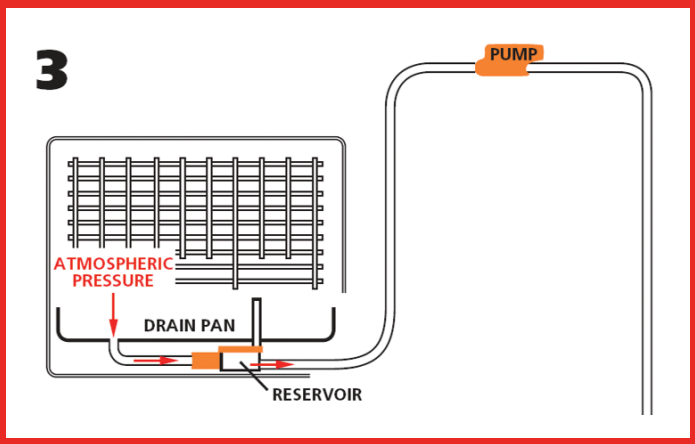
Typical Sequence of Operation



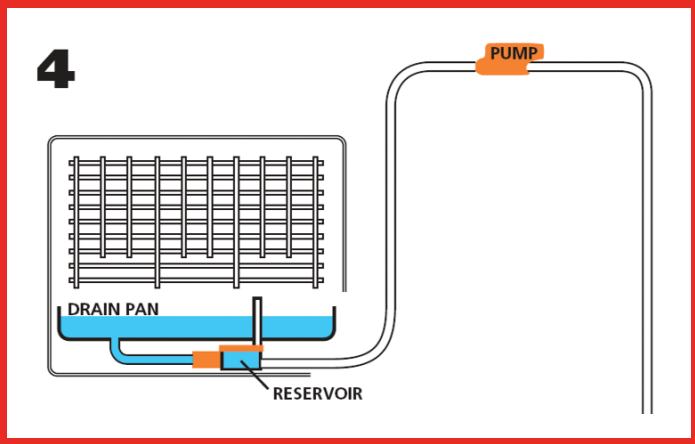
Drain pan fills with water which flows into reservoir. Intake hose between reservoir and pump is empty i.e. filled with air.



Rising water lifts the float, activating the pump, which self primes by sucking water from reservoir. During this period the pump is operating hot and dry and will click loudly. Once the air in the intake hose has been purged, water entering the pump cools and lubricates, so that the clicking noise becomes a low hum. Water flows through the pump and out the discharge hose.



Water level in the reservoir has now receded enough to drop the float, deactivating the pump. However, the weight of the water in the discharge hose plus atmospheric pressure at the drain pan outlet forces the water remaining in the intake hose to continue flowing out through the pump until the reservoir intake hose, pump and discharge hose are completely empty, at which point the siphoning stops.



As the evaporator produces more condensate, the drain pan again fills up with water which flows into the reservoir. Since the intake hose is filled with air again, the cycle repeats itself.

THE PROBLEM IS THAT EVERY TIME THE PUMP RUNS HOT AND DRY IT SUSTAINS A SMALL AMOUNT OF DAMAGE WHICH CAUSES PREMATURE WEAR. THE NEXT TIME THE PUMP STARTS UP DRY, IT MAY RUN 11 SECONDS BEFORE IT COOLS DOWN. THE NEXT TIME 12 SECONDS AND SO ON. ALSO, WHILE THIS IS OCCURRING, THE PUMP IS CLICKING LOUDLY. THIS IS ACCEPTABLE DURING THE START-UP PHASE, BUT IT IS MOST DEFINITELY NOT ACCEPTABLE DURING SUBSEQUENT OPERATION ON THE PUMP. WHEN YOU CONSIDER THAT THIS WILL OCCUR A NUMBER OF TIMES EVERY DAY OF THE COOLING SEASON IT IS EASY TO SEE THAT THE DAMAGE WILL RAPIDLY ACCUMULATE. IF THE PUMP IS ALLOWED TO OPERATE IN THIS CONDITION REPEATEDLY, THE NOISY PERIOD WILL GET LONGER AND LONGER OVER THE COOLING SEASON UNTIL THE CUSTOMER COMPLAINS OR THE PUMP EVENTUALLY SEIZES UP AND FAILS. THIS CAN EASILY BE AVOIDED BY INSTALLING THE DISCHARGE HOSING CORRECTLY WITH AN AIR GAP WHICH WILL EQUALIZE THE ATMOSPHERIC PRESSURE AND ELIMINATE THE SIPHONING EFFECT.