



System-based CalARP Inspection: TU-A2

March 25, 2025

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Agenda:

- Introduction
- Knowledge Survey
- Conversation, Dialogue
- Prevention Programs (2,3)
- Ammonia Engine Rm. Equip. Inspection



Diagram of a Direct Expansion System

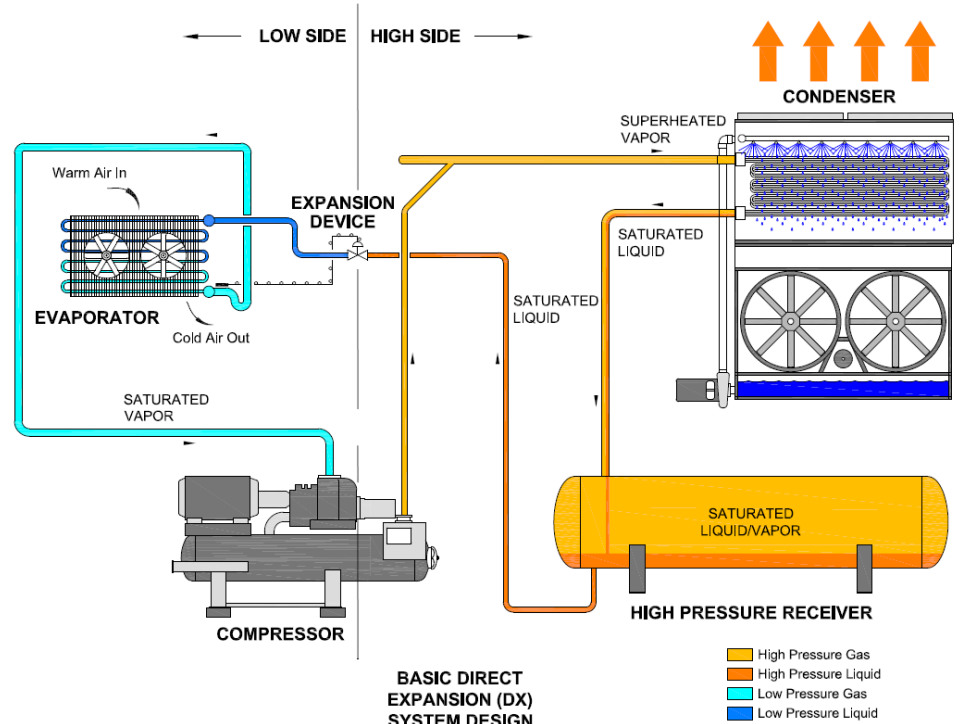


Diagram of a Recirculated System

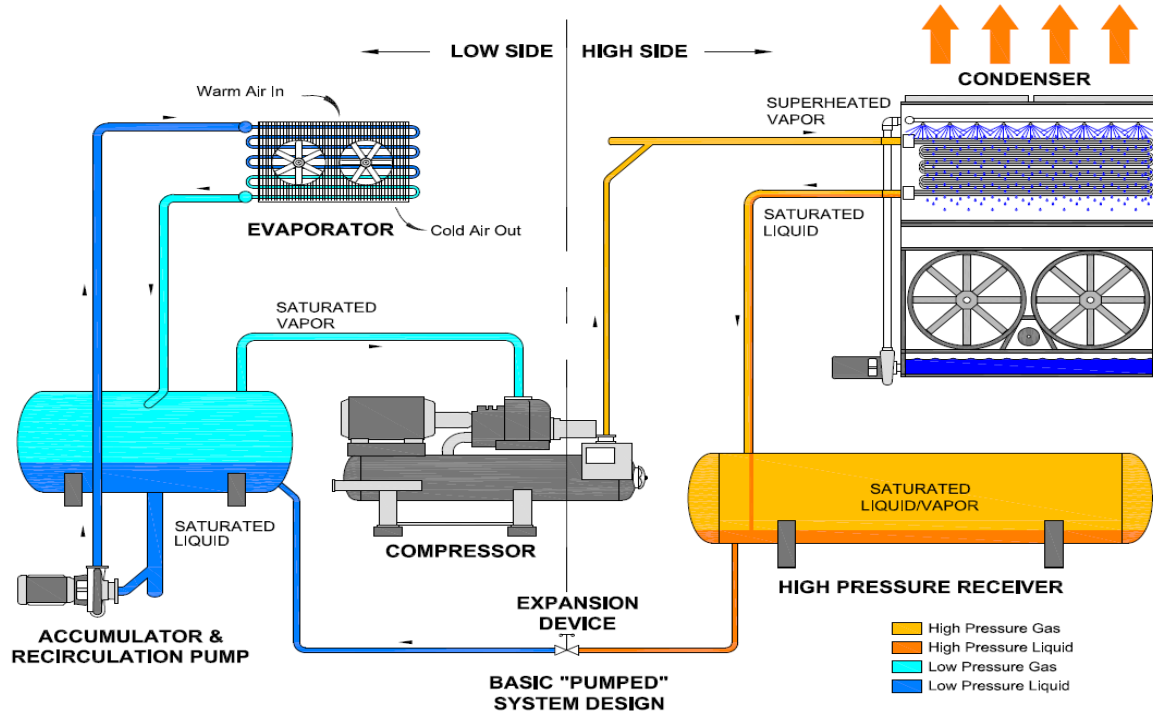
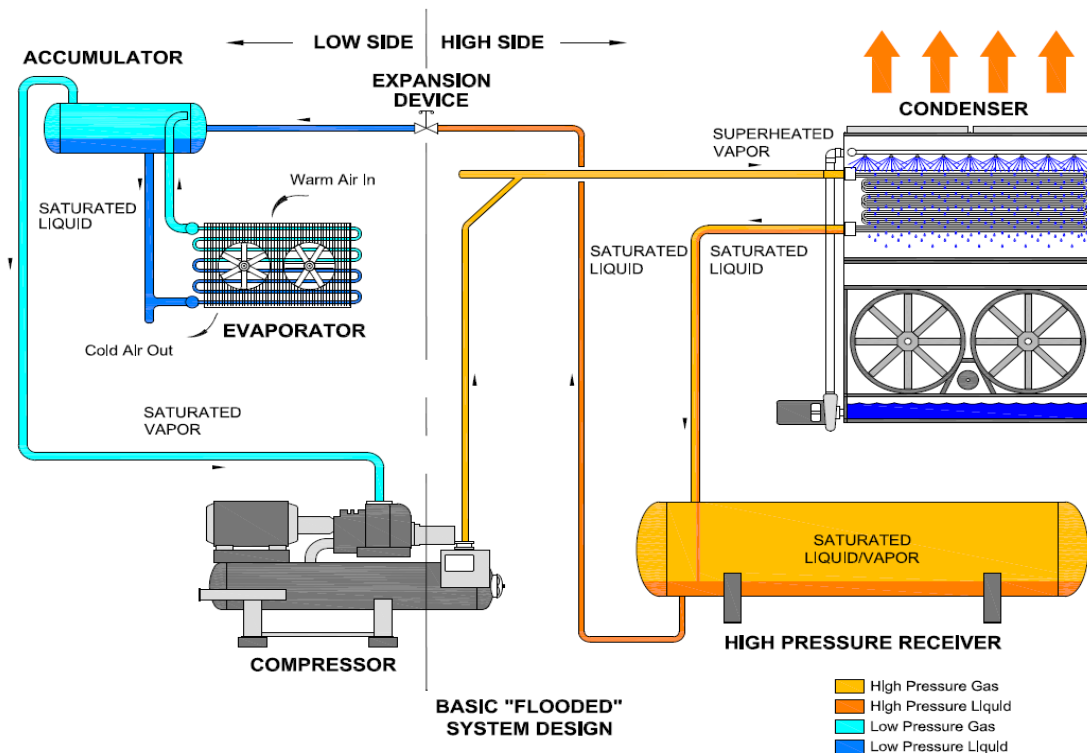


Diagram of a Flooded System



Direct Expansion Video - <https://www.youtube.com/watch?v=jW5V68zuF40>

Gravity Flooded Video - <https://www.youtube.com/watch?v=8UIb51iKhdo>

Recirculated Pump Video - <https://www.youtube.com/watch?v=E3KwtYacM6E>



Ammonia Refrigeration Equipment we will be discussing with Prevention Programs and RAGAGEP Inspections:

- Evaporators
- Condenser
- Recirculator
- Piping
- Compressor
- Relief Valve Termination Piping





- Drain pans/catch cans beneath the iced piping
- The drain pans allow water to be drained into a drain
- Prevents water from pooling below the evaporators
- No slip hazard



- The evaporator is protected by a bumper bar
- Early indicator before hitting the evaporator



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Problems

- The accumulation of ice on the evaporator
 - Added weight of the ice increases the load on the evaporator supports
 - Ice acts as an insulator, which causes the evaporator to run less efficiently
 - Ice buildup can interfere with the fan blades (dangerous)
- Accumulation of ice on the ceiling
 - Ice on the ceiling indicates that there is a vapor barrier breach in the ceiling/roof



- Door is safely closed
- No debris around the entrance
- Labeled with the unit on the door



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Ice buildup on a penthouse door

- The ice prevents the door from closing
- Sometimes results in unsafe ways of forcing a door closed
- Defeats panic hardware being operated from inside the refrigerated space
- Ice can restrict access from/to the penthouse
- Major source of heat loss



- Vessel and piping are clearly labeled
- No ice on the insulation
- Dead-man valve at the drain point



- Ice indicates that the insulation on the vessel has failed
- Ice on the piping and valves can prevent the valves from being manipulated/operated
- Ice prevents piping from being inspected (insulation or corrosion)



- Piping is painted
- Permanent access to the mist eliminators and fans
- No indication of water leaks



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- Not labeled
- Piping is corroded
- Heavy water stains are indicative of water leaking
- Man door appears not to be sealed



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- Flexible stainless-steel piping was used and the insulation installed was not approved for use with ammonia
- Poor insulation traps moisture as opposed to keeping it out
- The pipes are being used as a platform. Ammonia pipes should not be used to support external loads



- Uninsulated pipes not protected against corrosion
- Pipes are not labeled
- The insulation is crushed because people stepped/sat on it while crossing this barrier
- The pipe labels are faded



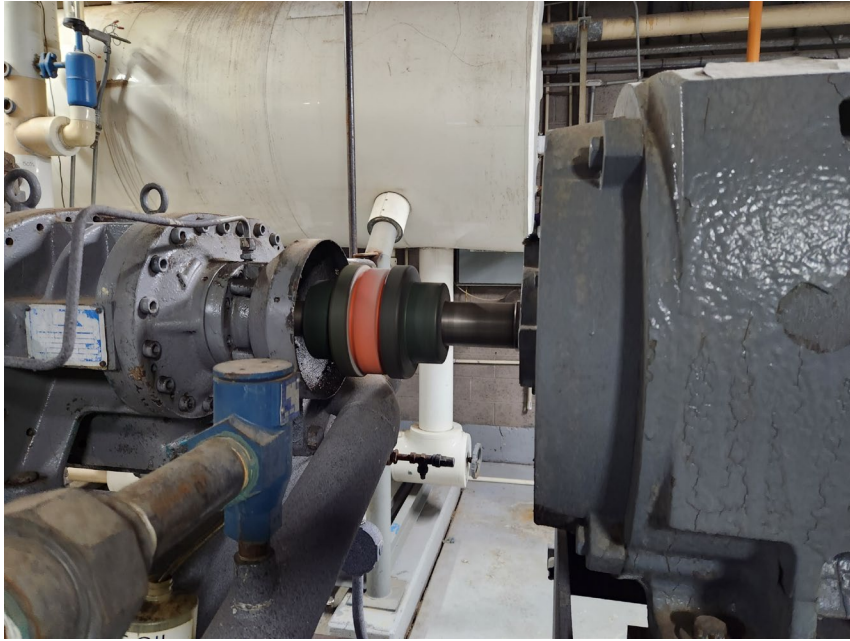


King valve label faded
Receiver tank paint chipping





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- Corroded, Not labeled
- Compressor safety cutout deteriorated



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- Relief piping is more than 7.25' above the roof
- Piping is labeled



- Relief piping terminates less than 7.25' above the roof
- Relief piping is not labeled



Any Questions?

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