



## Reduced refrigerant charge

### Liquid desiccant solutions



For over 75 years, Alfa Laval Kathabar has engineered and manufactured liquid and dry desiccant systems for dehumidification and energy recovery applications. Our technologies improve the reliability, economy and efficiency of any manufacturing or processing operation that is humidity, temperature or microorganism-sensitive. We meet the ever-changing needs of our customers with quality products – providing reliable, precise and economical temperature and humidity control.

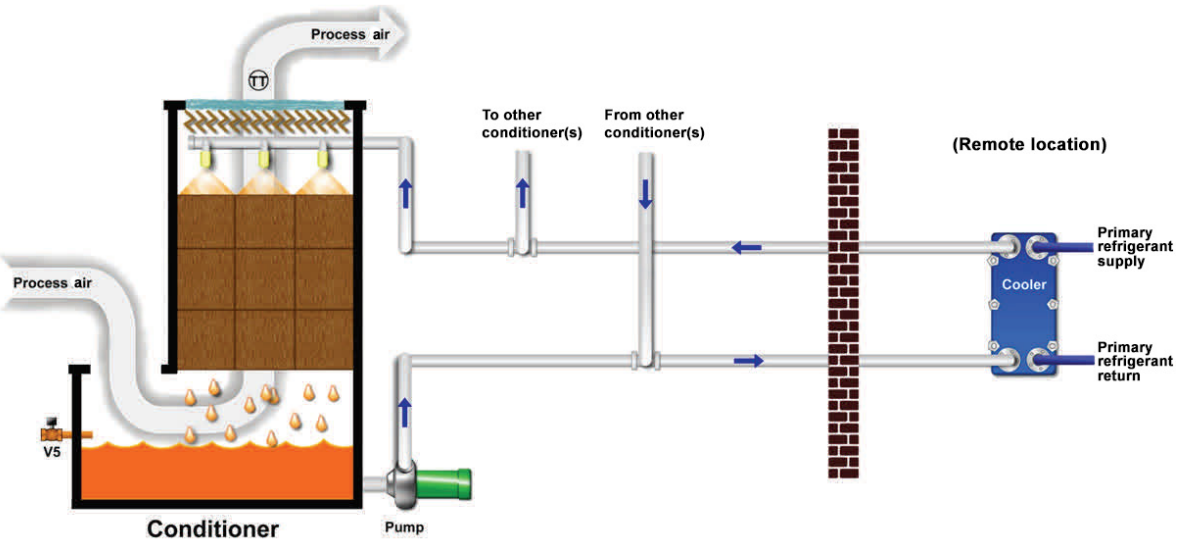
Alfa Laval Kathabar liquid desiccant systems provide a perfect solution for a wide range of applications for industrial, commercial, institutional and green/LEED facilities.

#### Advantages:

- Frost-free cooling
  - Temperatures as low as  $-60^{\circ}\text{F}$
  - Eliminates the need for defrost
- Desiccant can be used as a secondary refrigerant.
- Design flexibility
  - Ability to use hot water or low-pressure steam for regeneration (including waste heat).
  - Features multiple conditioners with a single centralized regenerator.
- Energy savings – 100% modulation capacity; less energy required to operate compared to dry desiccant or mechanical refrigeration systems.
- Performance reliability – non-vaporizing desiccant solution has infinite life.
- FRP (fiberglass) non-metallic industrial construction – long equipment life and reliability.
- Simultaneous air cooling and dehumidification – simple design provides high efficiency.
- Microbiological decontamination – effective biocide captures and neutralizes airborne pathogens.

## Secondary refrigerant systems using liquid desiccants

The illustration below shows the Alfa Laval Kathabar conditioner used as a secondary refrigerant system. In operation, air to be conditioned is cooled and dehumidified by contacting Kathene in the conditioner. By continuously circulating the desiccant through a heat exchanger, energy is extracted from the air and transferred to a coolant. The amount of heat extracted by the Alfa Laval Kathabar dehumidifier is modulated to exactly match the load, by controlling the coolant flow through the heat exchanger. This configuration reduces refrigerant charge to as low as 1lb/ton, as well as increases system efficiency and safety.



## Refrigerant systems comparison

	Distributed refrigerant systems (Ammonia)	Distributed refrigerant systems (Liquid desiccant)	Secondary refrigerant system (Ammonia)	Secondary refrigerant system with liquid desiccant
<b>Refrigerant pumped throughout facility (volume)</b>	Primary refrigerant: Typically ~20 lbs/ton of cooling	Primary refrigerant: Typically ~15 lbs/tons of cooling	Secondary refrigerant: ~1 lb/ton of cooling possible	Secondary refrigerant: ~1 lb/ton of cooling
<b>Refrigerant charge in occupied areas</b>	Yes	Yes	No	No
<b>Maintenance requirements</b>	Frequent coil cleaning required	No defrost required	Frequent coil cleaning required	No defrost required
<b>Energy usage</b>	33% of moisture which freezes on coil surface is reintroduced into space	100% modulation of heating and cooling sources. Additional energy used by desiccant pumps.	33% of moisture which freezes on coil surface is reintroduced into space.	100% modulation of heating and cooling sources.

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Alfa Laval reserves the right to change specifications without prior notification.

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