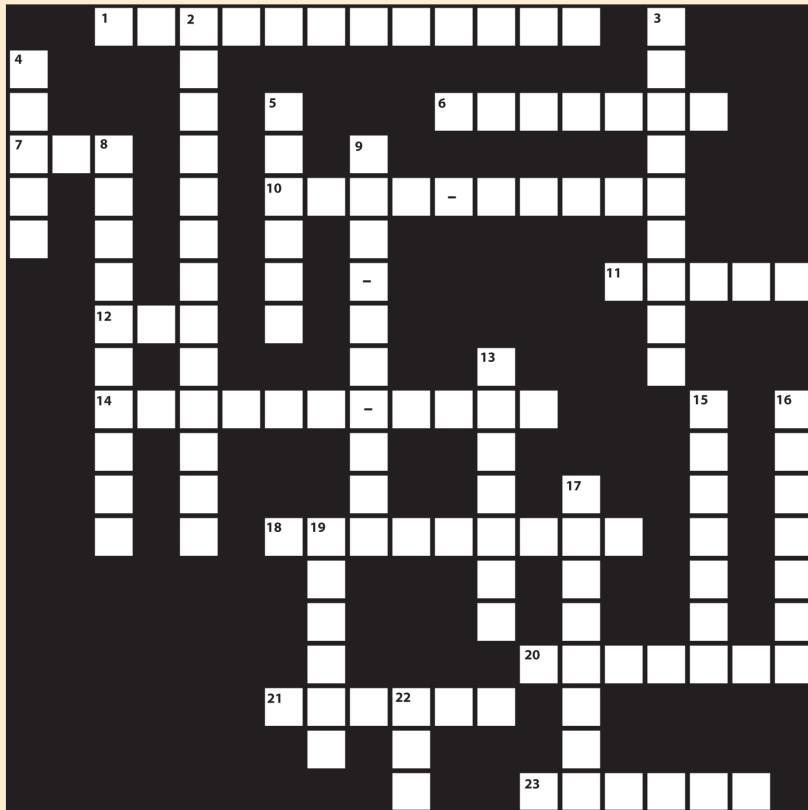




# Take the HVAC CHALLENGE™

BY STEVEN G. LIESCHEIDT, P.E., CSI-CCS, CCPR

## Air-To-Air Energy Recovery



### ACROSS

- This type of two-phase heat exchanger is a sealed system that consists of an evaporator, a condenser, interconnecting piping, and an intermediate working fluid in both liquid and vapor phases.
- An accumulation of dust or condensates on heat exchanger surfaces which reduces the heat exchanger performance by increasing resistance to airflow, interfering with mass transfer, and generally decreasing heat transfer coefficients.
- This organization publishes Standard 1060, "Rating air-to-air energy recovery ventilation equipment."
- In this air-to-liquid/liquid-to-air enthalpy recovery system, a sorbent liquid circulated between supply, and exhaust contractor towers directly contacts both airstreams, transporting water vapor and energy between the airstreams.
- This section can be installed on a heat exchanger to reduce cross-contamination.
- This type of air-to-air energy recovery equipment is suitable when outside air

humidity is low and latent space loads are high for most of the year.

- This media is made by knitting wire into an open woven cloth or corrugated mesh, which is layered to the desired configuration.
- This occurs as air is entrained within the rotation medium and is carried into the other airstream in a rotary-style, air-to-air energy recovery unit.
- These should be placed in both the supply and exhaust airstreams to reduce fouling and cleaning frequency of an air-to-air energy recovery device.
- This two-step heat transfer process is when the condensation process liberates this form of heat of condensation, which is then transferred to the other stream as sensible heat.
- This law of thermodynamics states that heat energy always transfers from a region of high temperature to one of low temperature.

### DOWN

- This characteristic of a heat exchanger depends heavily on the airflow direction and pattern of the supply and exhaust airstreams.
- This type of energy recovery unit uses coils that are piped in a loop between the exhaust airstream and supply airstream, typically utilizing water or an antifreeze solution.
- This type of heat exchanger is available in many configurations, materials, sizes, and flow patterns and generally has modules that can be arranged to handle almost any airflow, effectiveness, and pressure drop requirement.
- This type of air-to-air energy exchanger uses a revolving cylinder filled with an air-permeable medium having a larger internal surface area.
- This is the type of heat recovery generally associated with heat pipe energy recovery devices.
- This type of energy recovery is the process of recovering energy an/or moisture from an airstream at a high temperature or humidity to an airstream at a low temperature or humidity.
- In a process-to-\_\_\_\_\_ application, waste heat captured from the process exhaust heats building makeup air in the winter.
- This occurs because the differential static pressure across the two airstreams drives air from a higher to a lower static pressure region.
- In a process-to-\_\_\_\_\_ application, heat is captured from the exhaust steam and transferred to the supply airstream.
- This is a temperature only form of energy recovery.
- This organization publishes Standard 84, "Method of testing air-to-air heat exchangers."
- This type of air-to-air energy recovery equipment allows the transfer of both sensible and latent heat, the latter due to the difference in water vapor pressures between the airstreams.

To brush up on the facts behind this month's clues, refer to Chapter 44 ("Air-to-Air Energy Recovery") in the 2004 ASHRAE Handbook — Systems and Equipment.

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