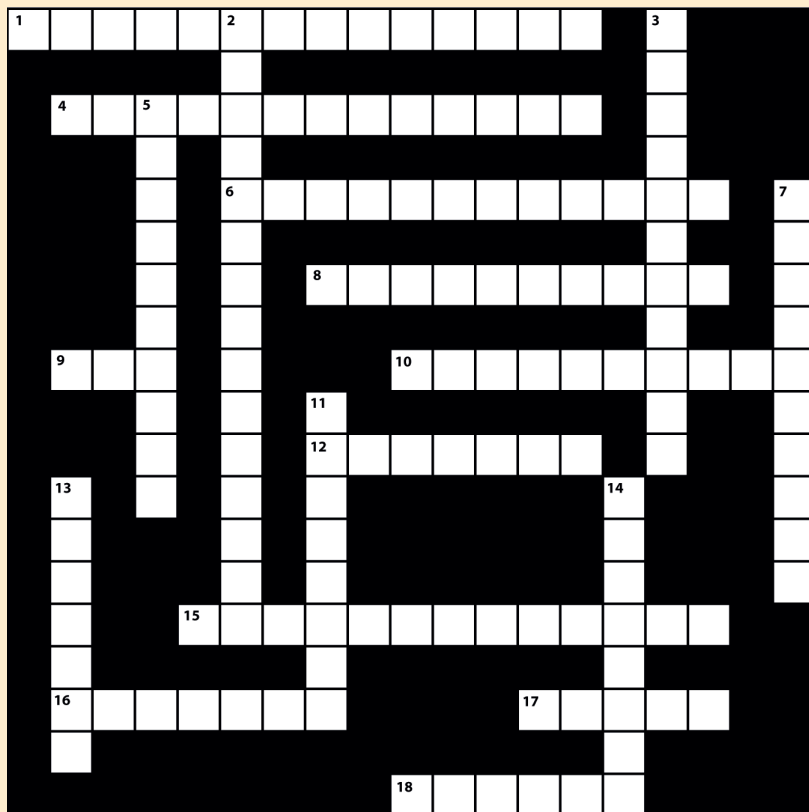




Take the HVAC CHALLENGE™

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

Decentralized Cooling and Heating



ACROSS

1. These types of decentralized units usually do not include return air fans.
4. These types of systems have several separate A/C units, each with an integral refrigeration cycle.
6. In commercial self-contained refrigeration equipment, either electronic expansion valves or this type of refrigerant valve are used.
8. These control devices are either unit-mounted or wall-mounted.
9. This allows more sophisticated unit control by time-of-day scheduling, optimal start/stop, duty cycling, demand limiting, custom programming, etc., for decentralized system equipment.
10. This type of control cycle uses either air or water at appropriate temperatures to minimize the use of mechanical cooling to save energy.
12. One of the many advantages of using decentralized cooling and heating systems is that this cost is usually low.
15. Commercial self-contained units usually feature either scroll or this type of compressor.

16. Many air cooled room conditioners experience evaporator icing and become ineffective when this temperature falls below about 65°F.

17. This is one of the concerns of using rooftop units and can be in the form of outdoor radiated, indoor radiated, or duct discharge.

18. One of the many advantages of using decentralized cooling and heating is that this can be metered directly to each tenant fairly conveniently.

DOWN

2. These types of commercial self-contained units typically have high-pressure cut-out controls, which protect the unit and ductwork from high static pressure.
3. In decentralized cooling and heating-type equipment, the capability of handling this air is fixed by equipment design.
5. One of the disadvantages of using a decentralized cooling system is that this type of drain is needed at each A/C unit.
7. This type of economizer consists of a water coil located in the self-contained unit upstream of the DX cooling coil.
11. This type of economizer uses cool outside air to either assist mechanical cooling or, if the outside air is cool enough, provide total cooling.
13. The units are designed as central-station equipment for single-zone, multi-zone, and VAV decentralized applications.
14. Along with temperature control, control of this may also be less stable with decentralized systems than with centralized cooling systems, especially at very low cooling loads.

To brush up on the facts behind this month's clues, refer to Chapter 5 ("Decentralized Cooling and Heating") in the 2004 ASHRAE Handbook — HVAC Systems and Equipment.



Liescheidt is owner of SPPECCS Consulting, LLC in St. Louis. E-mail him at sppecss@sbcglobal.net.

Solution to April's HVAC Challenge™

