Take the HVAC CHALLENGE™

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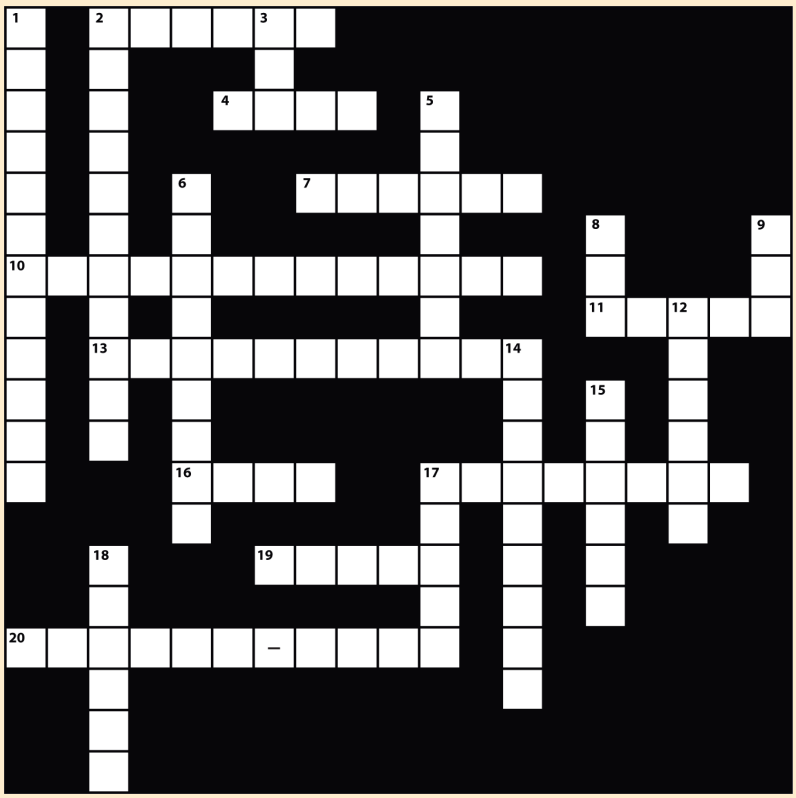
Liquid Chilling Systems



ACROSS

2. This organization publishes a standard titled "Safety Standard For Refrigerant Systems."
4. This type of condenser pressure switch opens if the compressor discharge pressure exceeds the value prescribed in ASHRAE Standard 15.
7. Condensers and coolers with this type of head require the water pipes to be disconnected for tube access and maintenance.
10. These types of chillers use combinations of cylinder unloading and on/off compressor cycling of a single or multiple compressors.
11. Liquid chillers with this type of compressor include a slide valve that adjusts the length of the compression path.
13. These types of liquid chillers are driven by electric motors commonly using adjustable pre-rotation vanes that are sometimes combined with movable diffuser walls.
16. This type of motor-driven liquid chiller is usually more expensive than hermetically sealed units but it can be more efficient.
17. In this type of multiple chiller arrangement, liquid to be chilled is divided among the liquid chillers and then the multiple chilled streams are combined again in a common line after chilling.
19. This type of temperature controller is a thermostatic device that unloads or cycles the compressor(s) when the cooling load drops below minimum unit capacity.
20. This type of water box permits tube access with the water piping intact.

DOWN

1. This type of compressor is commonly used in liquid-chilling machines up to about 450 tons chiller capacity.
2. This type of timer is sometimes used to limit the starting frequency in liquid chillers.
3. This organization publishes a standard titled "Method of Measuring Machinery Sound Within An Equipment Space."
5. This allowance in the order of magnitude of 0.00025 sq ft °F-h/Btu is included in manufacturers' ratings in accordance with ARI Standard 550/590
6. This type of turbine extracts rotating energy as a portion of the refrigerant vaporizes.
8. This bypass allows the compressor to operate down to zero load.
9. This type of refrigerant pressure (or temperature) safety control opens when the evaporator pressure (or temperature) reaches a minimum safe limit.
12. This type of refrigerant safety valve should be vented outdoors or to the low-pressure side of the vessel in accordance with regulations or standards.
14. Cooling of this fluid is not usually required for air conditioning; however, if it is used, a refrigerant-cooled coil in the crankcase or a water cooled cooler may be used.
15. This type of hermetic compressor is commonly used in liquid-chilling machines up to about 25 tons chilling capacity.
17. This auxiliary unit is required for centrifugal liquid chilling machines using R-123, R-11, R-113, or R-114.
18. In this type of multiple chiller arrangement, the chilled liquid pressure drop may be higher if shells with fewer liquid-side passes or baffles are not available.

To brush up on the facts behind this month's clues, refer to Chapter 38 (*"Liquid Chilling Systems"*) in the 2004 ASHRAE Handbook – Systems & Equipment.

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