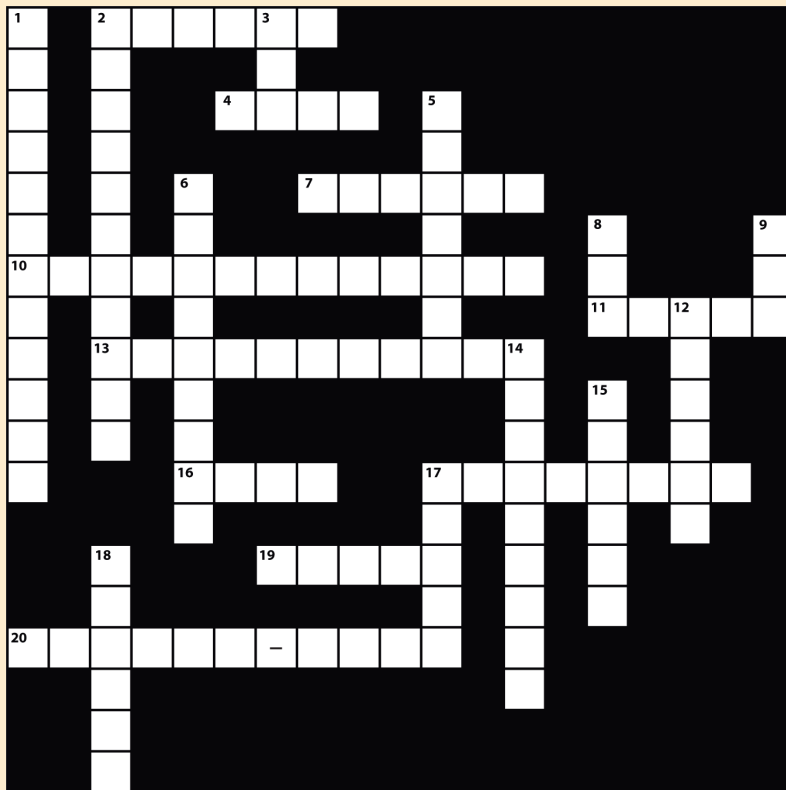


Take the HVAC CHALLENGE™

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

▶ Liquid Chilling Systems



ACROSS

- This organization publishes a standard titled "Safety Standard For Refrigerant Systems."
- This type of condenser pressure switch opens if the compressor discharge pressure exceeds the value prescribed in ASHRAE Standard 15.
- Condensers and coolers with this type of head require the water pipes to be disconnected for tube access and maintenance.
- These types of chillers use combinations of cylinder unloading and on/off compressor cycling of a single or multiple compressors.
- Liquid chillers with this type of compressor include a slide valve that adjusts the length of the compression path.
- These types of liquid chillers are driven by electric motors commonly using adjustable pre-rotation vanes that are sometimes combined with movable diffuser walls.
- This type of motor-driven liquid chiller is usually more expensive than hermetically sealed units but it can be more efficient.

- 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.
- 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.
- This type of water box permits tube access with the water piping intact.

DOWN

- This type of compressor is commonly used in liquid-chilling machines up to about 450 tons chiller capacity.
- This type of timer is sometimes used to limit the starting frequency in liquid chillers.
- This organization publishes a standard titled "Method of Measuring Machinery Sound Within An Equipment Space."
- 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
- This type of turbine extracts rotating energy as a portion of the refrigerant vaporizes.
- This bypass allows the compressor to operate down to zero load.
- This type of refrigerant pressure (or temperature) safety control opens when the evaporator pressure (or temperature) reaches a minimum safe limit.
- 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.
- 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.
- This type of hermetic compressor is commonly used in liquid-chilling machines up to about 25 tons chilling capacity.
- This auxiliary unit is required for centrifugal liquid chilling machines using R-123, R-11, R-113, or R-114.
- 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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