Subject: PURGE CYCLING TIMER TO DETERMINE CHILLER LEAK RATE

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Cent. FER 82-4

1.0 PURPOSE

To determine a centrifugal chiller's noncondensible leak rate by monitoring the purge cycles with a cycling timer. This technique cannot be used for a water leak.

2.0 MACHINES AFFECTED

17C, 19C and 19D Series chillers, using R113, R-11 or R114 refrigerant.

3.0 INFORMATION

A cycling timer used to count purge cycles can be a valuable tool in determining the leak rate of 17C, 19C and 19D chillers. The number of purge cycles is proportional to the leak rate. A relatively small amount could be an indication of a tight machine, while a large number would determine that a leak test should be performed. A tight machine will usually cycle one or two times on start-up and twice a day while running. A considerably larger quantity will indicate a leak check is required.

This method in determining leak rate assumes the purge is operating normally. Obviously, if the purge is not functioning as designed, the cycle data could give a distorted view of leak rate. The purge recovery system should be checked to see if it is operating as designed before applying this technique.

One way of applying this procedure is to install the purge counter on a temporary basis. Approximately twenty-four hours before performing an operating shutdown inspection install a cycling timer in parallel with the purge indicating light. If the chiller is to be shut down several days or weeks before the inspection, have the building superintendent inform the branch office so that cycling timer can be installed before machine shutdown. When the technician returns for the inspection,it will be possible to determine the severity of the machine's leak rate. If the purge did not operate at all, a leak check will not be necessary and save a considerable amount of service time. A large number of counts would indicate a thorough leak check should be performed.

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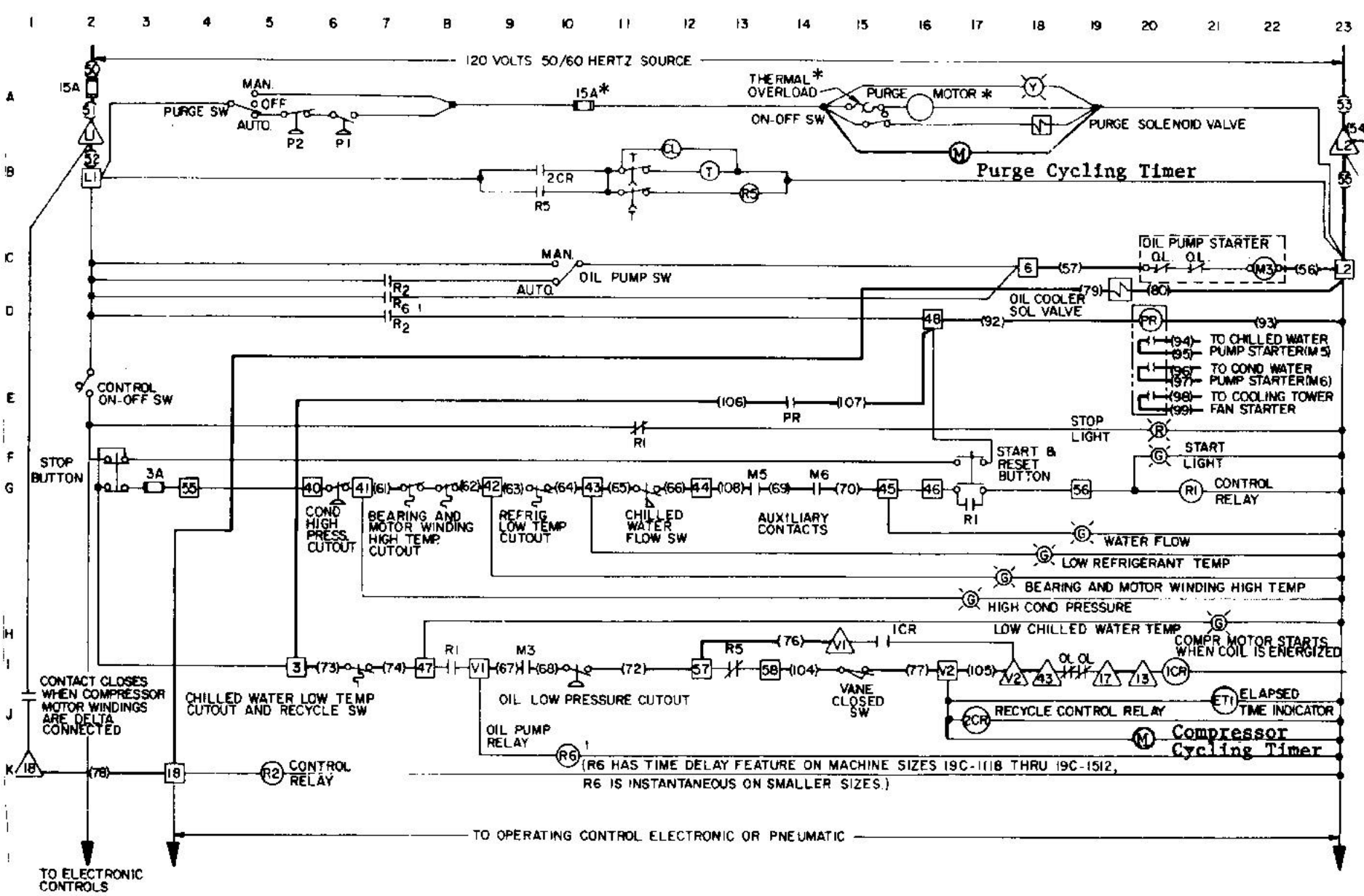

R-114 Variables

*No purge motor or 15-amp fuse.

†R6 becomes TDR.

LEGEND

- □ Terminals on Junction Panel in Control Console
- △ Terminals in Compressor-Motor Starter
- (R) (Y) (G) Red, Yellow, Green, Panel Lights
- ——— Wire furnished with machine
- —( )— Field Wire, not by Carrier

Safety Control Schematic Wiring

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A second method is to apply cycling timer on a permanent basis in conjunction with a compressor run and start timers. With these three timers it is possible to obtain a record of purge counts compared against the compressor starts and run time. A base line would be established with the original counter readings. If the purge count increased from the original parameters, a leak check would be performed on the chiller.

4.0 RECOMMENDATIONS

To measure the number of purge cycles, a cycling timer is wired in parallel with the purge motor and solenoid valve. Some chillers come with compressor elapsed time meters and cycling timer installed. If they are not already installed, they would be wired in parallel with the ICR coil. The attached control schematic shows the general location of all three timers. The new timers should be mounted at a convenient place in the control box and connected with wire of the same gauge and similar quality as the existing control wiring. All wiring should be performed in accordance with acceptable wiring practices. The following are Carrier part numbers for recommended timers:

1. Cycling Timer - HK28ZZ115
2. Elapsed Time Indicator - HK28HZ115