



AIR COOLED CHILLER CLEARANCE RECOMMENDATIONS

APPLICATIONS

Supersedes: 150.14-ES1 (1196)

Form 150.14-ES1 (705)

GENERAL

This Engineering Supplement contains general recommendations for clearance around outdoor air cooled packaged chillers. Satisfactory clearance is necessary to allow for optimum unit performance and operation as well as access for safe maintenance and servicing.

BACKGROUND

Outdoor air cooled chiller popularity has grown considerably over the last 25 to 30 years. This has occurred for many reasons ranging from lower installation costs to lower maintenance requirements and costs versus the water cooled chillers with outdoor cooling towers. In efforts to maximize the use of the available job site space, architects are continually under pressure to locate outdoor equipment in areas where they will consume the least amount of room. This is causing Consulting Engineers to place chillers in areas with less than desirable clearance around these types of units. This can create a challenge for air cooled chillers which require a significant amount of air. In the process, this can promote conditions to cause air recirculation.

The 2005 ASHRAE Environmentals Handbook, Chapter 16 is devoted to "Airflow Around Buildings." It mentions that airflow can be influenced by surrounding buildings or topography. Therefore, it is too complex to generalize or predict just how the airflow will behave at the selected equipment location. Because of these ASHRAE mentioned conditions and restricted areas, less than optimum chiller performance and operation can occur.

YORK AIR CLEARANCE RECOMMENDATIONS

The following clearances are recommended by YORK for peak performance, reliable operation and maintenance.

Unit Surface	Recommended Distance in Feet
Side to wall	6'
Rear to wall	6'
Control panel to wall	4'
Over unit	No obstructions
Distance between adjacent units	10'

Walls should be no higher than the top of the unit. The area within the clearances must be kept clear of clutter. Additional height should be included for snow accumulation for units which are expected to operate at full load during the winter. When the unit(s) need to be installed in pits or with walls higher than the unit(s) due to Architect-

tural requirements, the chiller(s) must be installed on an elevated platform. This will avoid air recirculation around the unit(s). The other approach is to either have extended openings or louvers for free fresh air intake. As always, the more clearance, the better the chiller will perform.

COMPETITION

Here is what the major competition publishes

Unit Surface	Carrier	McQuay	Trane
Side to wall	6'	5' if 50% open wall 6' if solid wall	4'
Rear to wall	6'	10'	2'
Control to wall	6'	4'	To meet N.E.C.
Over unit	Unobstructed	Unobstructed	Unobstructed
Two units side by side	10'	12'	8'

McQuay wants any adjacent walls no higher than the height of the unit and the side to wall increased to 8' in pit type locations

Trane also recommends that the top of surrounding walls should be no higher than the top of the fans.

Trane publishes the smallest clearances in the industry. This leads Consulting Engineers and Architects to want to take advantage of them. However, Trane literature still talks about the importance of the unit placement so that there is sufficient air flow through the unit. This is to avoid air starvation and the potential for air recirculation.

(Either of these conditions can drive up the condensing temperature and can cause the unit to operate at lower capacity and be less efficient.) They point out that these need to be avoided in order to achieve the "optimum" performance. Trane claims that the performance is minimally affected (whatever that means?) because of their condenser design and "Adaptive Control". The "Adaptive Control" feature can help the unit understand the surrounding operating conditions and will optimize the unit's performance to keep it running even though abnormal conditions may exist. **[This also certainly means that this would prohibit the achievement of the ARI Certified performance.]** Thus, this lulls the designer to feel that it is acceptable to take advantage of these tighter clearances, because the "Adaptive Control" will keep the unit operating at its "optimum performance". However at the bottom line, this means that the unit will be unloaded and will be running at lower tonnage. This could have been alleviated if the designer had wisely used the more prudent YORK recommended clearances. Consulting Engineers should be encouraged to use common sense to increase clearances around this equipment to assure maximum capacity, highest efficiency and peak operation.

YORK OFFER

The YORK recommendation to the owner or Consulting Engineer should always be to encourage use of the YORK clearances. This will result in the best opportunity for airflow not only to, but away from the equipment to avoid the possibility of air recirculation. Gained benefits are:

1. Facilitates Safe Servicing.
2. Encourages Important Routine Maintenance.
3. Peak Performance.
4. Reliable Operation.
5. Elimination of Nuisance High pressure Cutouts.

However, reduced clearances may be used either due to job site restrictions or competitive recommendations. Air cooled scroll chillers must be equipped with either the High Discharge Pressure Readout or 0° F Low Ambient option. [Air cooled screw chillers include the discharge pressure transducers as standard.] Whenever high discharge pressure occurs due to lower clearance, the unit will continue to run at reduced capacity (“optimum performance”) without tripping out on high pressure cutout. This assures that comfort cooling is continued during all kinds of operating conditions.

AIR COOLED CHILLER CLEARANCE CONSIDERATION

Consulting Engineers and owners are looking for application suggestions to allow equipment to operate at its optimum and its peak performance level. This supplement focuses on the importance of considering clearance around outdoor air cooled chillers. This can be a significant step in assuring the lowest possible system operating pressures and the best overall level of cooling stability.

