Consolidated Refrigeration

Things to consider before replacing reach in freezers or coolers with a walk-in freezer or cooler

1. Energy Consumption

A standard 8 x 8 x 8 walk-in freezer uses about 8,000 kWh per year in electricity and will cost you about $1,200 per year in energy costs to operate. You would need to replace 16 standard sized reach in chest freezers just to break even on energy usage and cost.

2. Cost

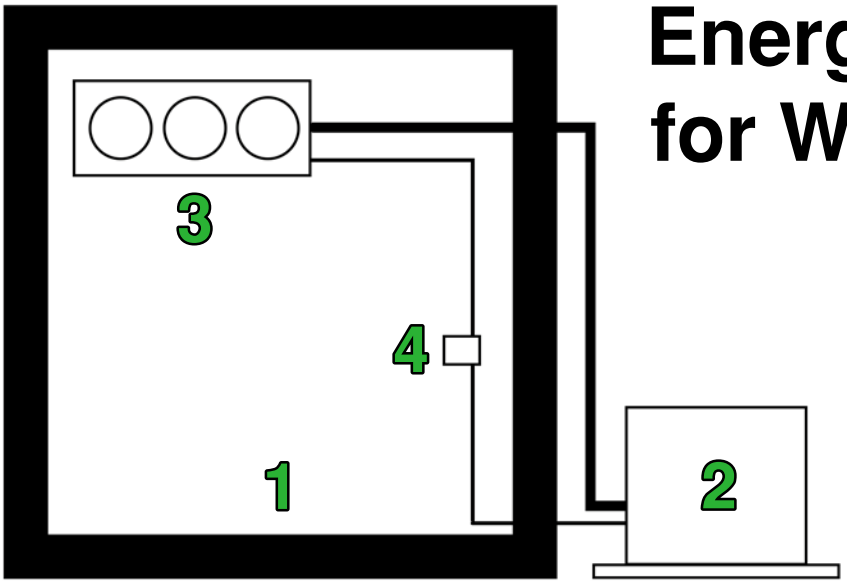
A standard 8 x 8 x 8 walk-in freezer purchased as a package with all the required refrigeration equipment, including shipping and installation will cost $10,000 - $15,000. You may be able to reduce the first cost if you are able to build the insulated box yourself. For coolers with temperatures above 45 degrees, this might be worth considering. For coolers that run at low temperatures below freezing, you could still build the insulated box yourself however special attention would need to be paid to the construction materials and assembly techniques to ensure a tight cooler envelope that reduces the potential for moisture laden air infiltration and excessive energy consumption. You should consult a refrigeration expert for design advice on the insulated box construction.

3. Storage Capacity

Reach-ins, as opposed to walk-ins, are modular which means you can plug them in as extra capacity is needed which reduces your baseline refrigeration load. One strategy to minimize energy consumption of the walk-in cooler would be to utilize several reach-in coolers until your storage capacity needs require you to fill the walk-in. As the walk-in is filled, the smaller chest coolers can be unplugged and taken off line. Vice versa, the walk-in cooler only needs to be powered on when your storage needs exceed the capacity of your reach-in coolers.

Conclusion

If you are making this decision to replace your reach-in coolers with walk-in coolers purely on the basis of reducing your energy consumption, chances are this will not be a cost effective project for you. Cost savings aside, there are operational benefits to walk-in coolers that may outweigh the increased energy consumption associated with these units such as significantly more storage capacity and a smaller foot print. If you decide to install a walk-in cooler there are energy efficiency equipment choices you should consider before making your purchase. These options are described on the back of this page:



Energy Saving Tips for Walk-in Coolers

1. Insulated Box

The more insulation used in the walls, roof and floor of the cooler box, the greater the thermal performance of system will be. GDS recommends using a minimum of 4" to 6" of XPS rigid foam insulation over the walls, ceiling and floor of the walk-in cooler. This insulation can be installed on either the inside or outside of the box. XPS foam insulation is durable and does not loose it's performance if it gets wet. It is also highly flammable so any exposed insulation should be covered with cement board or fire rated gypsum wall board. Entry doors should latch firmly closed and use gaskets to create an air tight seal.

2. Compressor

The compressor should be a high efficiency scroll compressor properly sized to meet the load of the cooler. The manufacture of the scroll compressor can determine you system load for you. This type of compressor will save approximately $400 per year over a standard hermetic style compressor. Refrigerant lines outside of the insulated box should be insulated with R-4 pipe insulation.

3. Evaporator

Evaporator fans installed inside the cooler should use Electronically Commutated Motors (ECMs) rather than standard shaded pole motors. These motors run more efficientyl and produce less heat that would otherwise need to be removed by the refrigeration system.

4. Controls

Installing evaporator fan controls will reduce the run hours on evaporator fan motors by shutting them off when the compressor is between duty cycles. This reduction in run hours saves energy and reduces the heat output by the fan motors. For freezer applications, separate controls can also be used to reduce the energy consumption of electric door heaters by cycling run times when the relative humidity in the air is low.