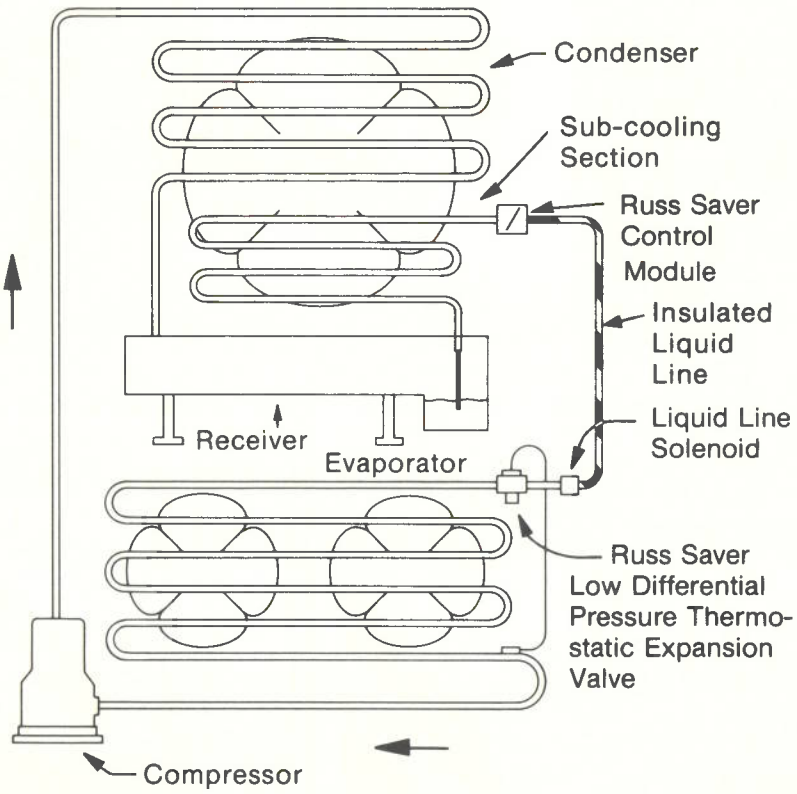
THE RUSS-SAVER

ENERGY SAVING

RUSS-SAVER

The Russ-Saver is an energy saving control system used with refrigeration systems that use outdoor air-cooled condensers. It operates, without adjustments, on a year-around basis at both high and low outside ambient conditions. The head pressure is allowed to vary with ambient temperature. Therefore, as ambient temperature drops, the head pressure drops. This drop in head pressure results in the compressor pumping more refrigerant per stroke and, due to the lower head pressure, requires less energy to compress the refrigerant. Operating at very low head pressures, which would exist at low outside air temperature, the power savings is substantial (as high as 50%).

The Russ-Saver System also automatically maintains a solid head of sub-cooled liquid at the Russell special low differential pressure thermostatic expansion valve. This solid vaporfree head of liquid at the thermostatic expansion valve eliminates flashing. The sub-cooling improves refrigeration efficiency by approxiamately ½% for each degree of sub-cooling.



BENEFITS

Year-around energy savings —

- The Russ-Saver conserves energy because the compressor will pump more refrigerant per stroke as the head pressure drops with outdoor temperature.
- The Russ-Saver conserves energy as the compressor requires less energy to compress the refrigerant as the head pressure drops with the outdoor temperature.
- The Russ-Saver saves energy even at high ambients due to sub-cooling. For example: on an R-502 system, sub-cooling will increase refrigeration system efficiency by approximately 5%. As a general rule, for each degree of sub-cooling, the refrigeration system efficiency will improve ½%.

COST SAVINGS

- requires less refrigeration charge than other types of low ambient controls
- lower cost to install as requires no extra refrigerant or wiring between condensing unit and evaporators

FEATURES

- automatically allows lower head pressure required for efficient system operation
- unique Russell control provides easy restart under low ambient conditions

DESIGN PHILOSOPHY

Today, the most expensive part of an overall operating refrigeration system is the energy cost required for operation of the compressor. Since energy (especially electrical energy) is continuing to increase in cost and is projected to increase substantially over the next ten years, Russell's design goal was to develop an energy saving system which would reduce the run time of the compressor and make the compressor operate more efficiently.

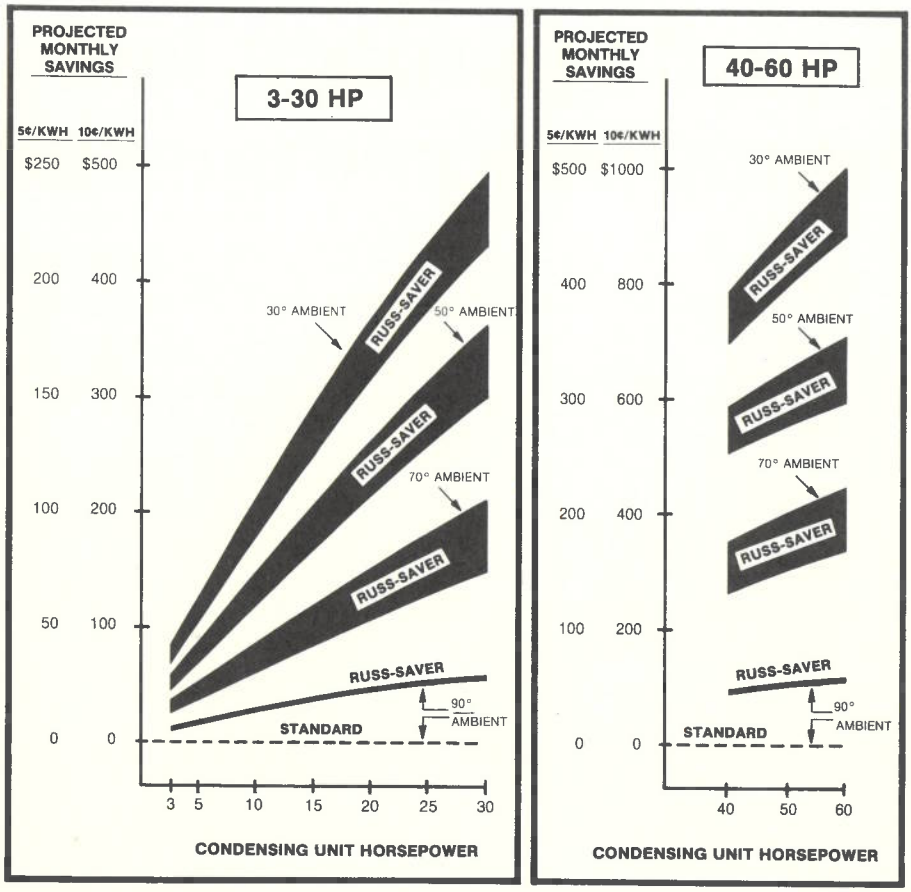
To carry out this design, it was determined that the easiest way to save energy was to lower operating pressure. Many systems are designed to operate by artificially maintaining high head pressure at low ambient conditions. Russell's Russ-Saver allows head pressure to vary with ambient temperature. Therefore, under low ambient conditions, the condenser will be condensing the gas at lower pressures resulting in a higher compressor volumetric efficiency. Of course, when you are running at a lower discharge pressure, the compressor is going to pump more gas while drawing less electrical energy per unit of time. In a conventional system this lower pressure creates a problem if the differential pressure across the thermostatic expansion valves is lower than designed for most thermostatic expansion valves.

Therefore, Russell has developed a special expansion valve which performs well at a lower pressure differential. To make this thermostatic expansion valve work properly a solid head of liquid must always be present at the thermostatic expansion valve especially on restart of the system. This is done through a special control built into the Russ-Saver system. Since sub-cooling of the liquid improves operating efficiency, the liquid, before it is transferred from the receiver to the evaporator, is run through a special circuit for sub-cooling. This procedure prevents flashing of the liquid in the refrigerant line and provides positive head to the thermostatic expansion valve.

PROJECTED MONTHLY SAVINGS

RUSS-SAVER SYSTEM VS. CONVENTIONAL HEAD PRESSURE CONTROL BASED ON AVERAGE MONTHLY AMBIENT TEMPERATURES*

RUSS-SAVER ———————
STANDARD SYSTEM — — —



ENERGY SAVINGS

At 0°F ambient, the energy savings will be about 50% but, even in high ambient conditions, a 5% savings will be realized. Since even the warmer climates will have cool nights, it is reasonable to expect annualized savings of 10-15% in the "sun belt" states and, as much as 25-30% in the cold climates as compared to systems where the head pressure is held artificially high.

The Russ-Saver is only available with Russell complete refrigeration systems. Contact your local authorized Russell wholesaler or Russell directly for a quotation on your requirements.

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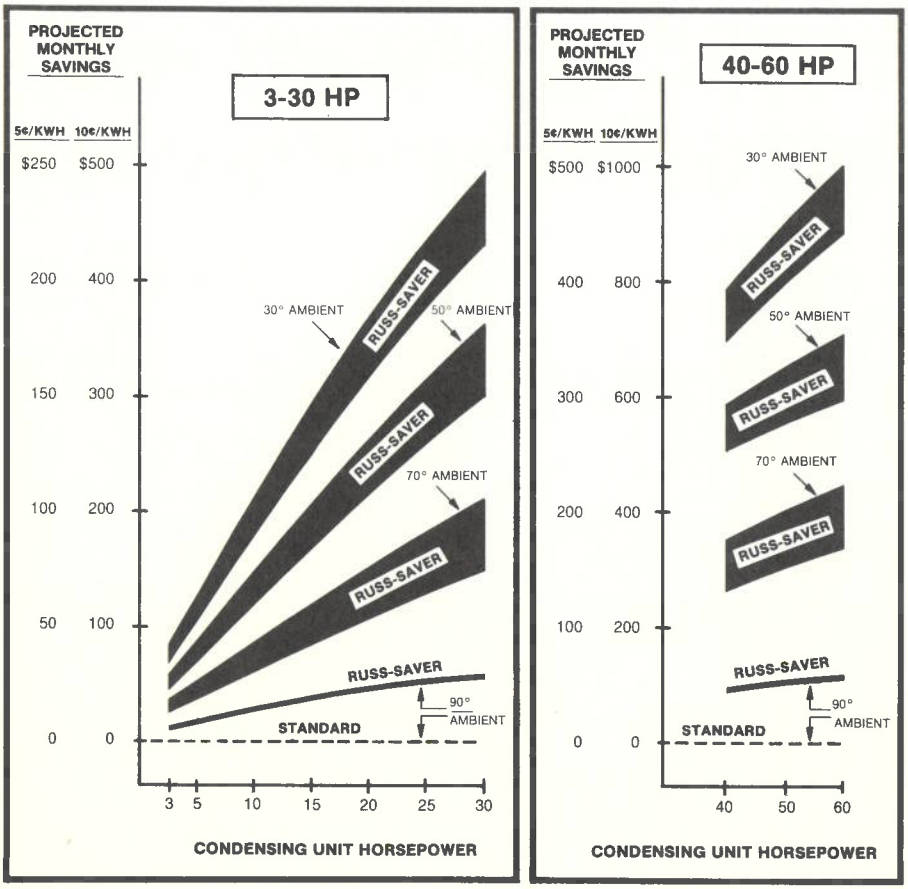

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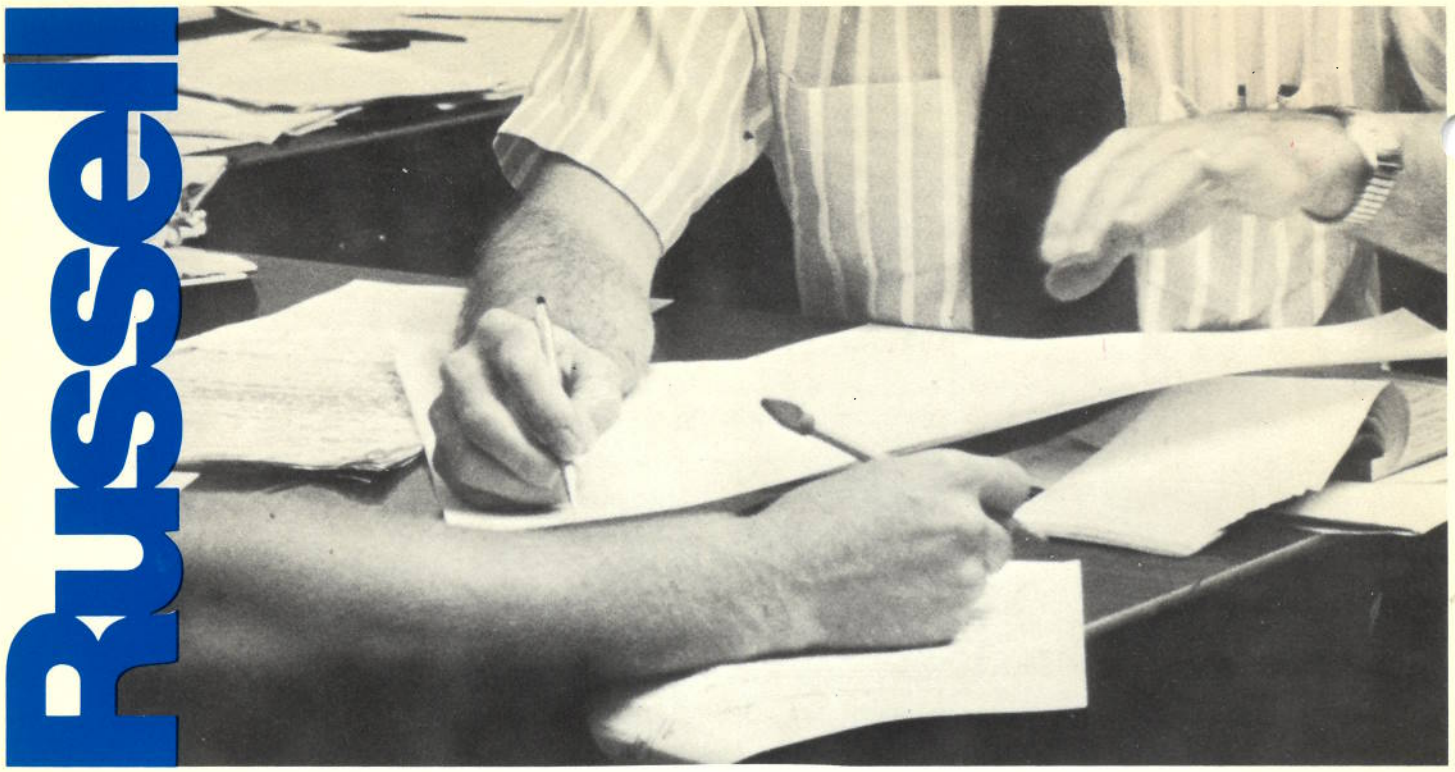

The Russell approach lets your special needs become our standard

Its been that way ever since RUSSELL introduced the industry's first low-profile, compact unit cooler, the RUSSELL ALL-TEMP.

By answering special refrigeration requirements over the years, finding many of these needs to be typical of a wide variety of applications, a complete line of standards have been developed, proven, and today are serving dependably in thousands of locations.

Thinking of the possible flexibilities needed in any unit, the RUSSELL APPROACH began by providing a full choice of sizes, fin spacings, options and controls that can be tailored to your specific needs without incurring expensive engineering or tooling costs. The results? Over 250 standard units with many options to choose from.

Whether it's an EVAPORATOR, CONDENSING UNIT, HEAT RECLAIM SYSTEM, AIR COOLED CONDENSER, or the cost-saving RUSSPAK™ Condensing Unit Package System that provides a balanced refrigeration system filled with virtually limitless options, the RUSSELL APPROACH means response to your performance and delivery requirements at a price you can afford.

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RUSSELL has earned an excellent reputation for service, on-time shipment, quality-engineered product, and competitive prices. Now, more than ever before, RUSSELL can match your standard *and* special needs where it counts — cost-effectively, quickly.

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